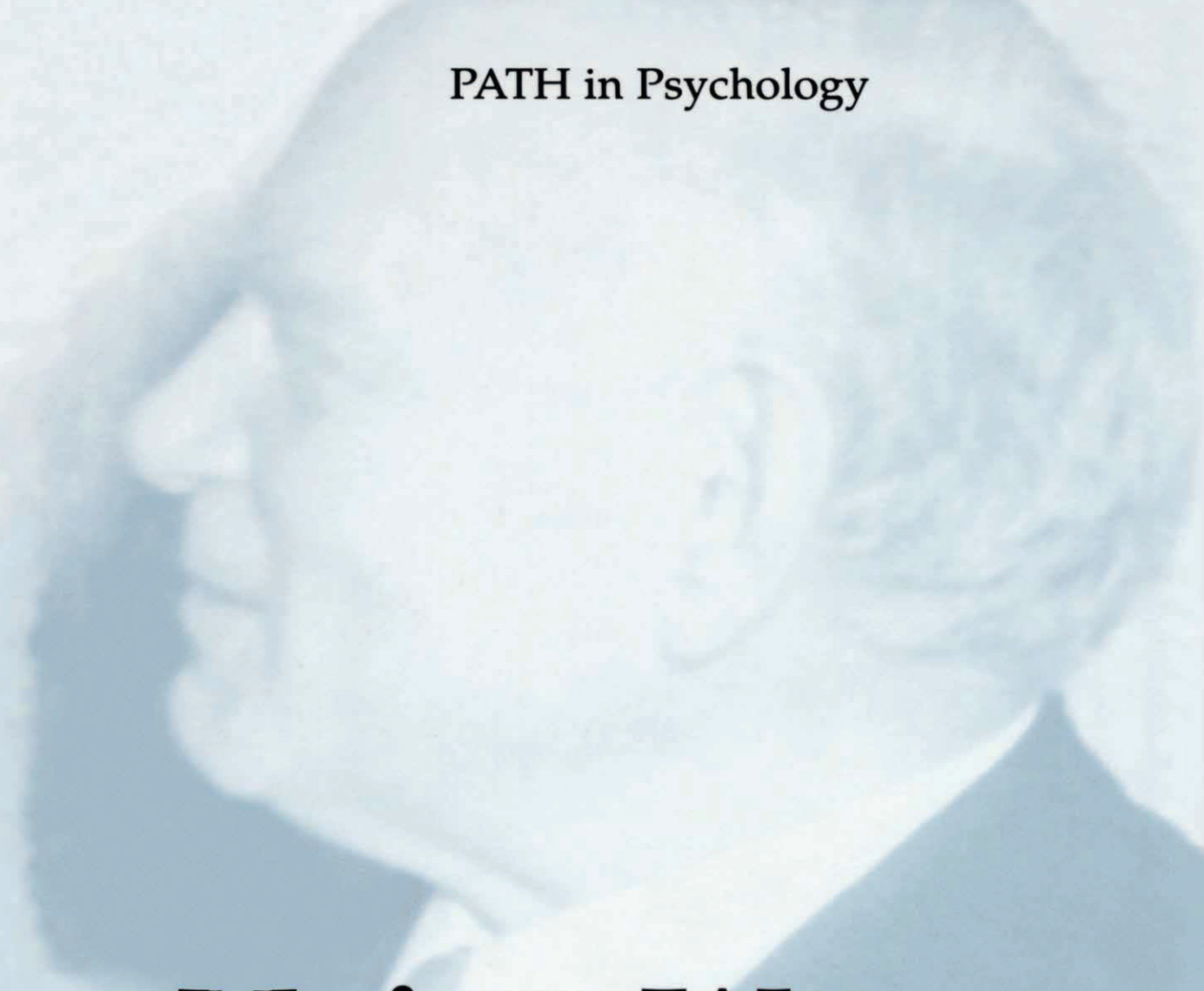
PATH in Psychology



Heinz Werner AND DEVELOPMENTAL SCIENCE

Edited by

JAAN VALSINER

HEINZ WERNER AND DEVELOPMENTAL SCIENCE

PATH IN PSYCHOLOGY
Published in Cooperation with Publications for the
Advancement of Theory and History in Psychology (PATH)

CHOICES FOR LIVING: Coping with Fear and Dying
Thoman S. Langner

COGNITIVE SCIENCE AND GENETIC EPISTEMOLOGY: A Case Study of Understanding
David Leiser and Christiana Gillièron

A CRITICAL PSYCHOLOGY: Interpretation of the Personal World
Edmund V. Sullivan

CRITICAL THEORIES OF PSYCHOLOGICAL DEVELOPMENT
Edited by John M. Broughton

CULTURAL PSYCHOLOGY AND QUANTITATIVE METHODOLOGY: Theoretical and Empirical Considerations
Carl Ratner

CULTURAL PSYCHOLOGY: Theory and Method
Carl Ratner

DEVELOPMENTAL APPROACHES TO THE SELF
Edited by Benjamin Lee and Gil G. Noam

EDUCATION, ARTS, AND MORALITY: Creative Journeys
Edited by Doris B. Wallace

FRANTZ FANON AND THE PSYCHOLOGY OF OPPRESSION
Hussein Abdilahi Bulhan

HEINZ WERNER AND DEVELOPMENTAL SCIENCE
Edited by Jaan Valsiner

HUMANISTIC PSYCHOLOGY: Concepts and Criticisms
Edited by Joseph R. Royce and Leendert P. Mos

THE LIFE CYCLE OF PSYCHOLOGICAL IDEAS
Edited by Thomas C. Dalton and Rand B. Evans

MANUFACTURING SOCIAL DISTRESS: Psychopathy in Everyday Life
Robert W. Rieber

THE MASS PSYCHOLOGY OF ETHONATIONALISM
Dusan Kecmanovic

THE PROCESS APPROACH TO PERSONALITY: Perceptgenesis and Kindred Approaches in Focus
Gudmund J. W. Smith

REGIONAL IDENTITY AND BEHAVIOR
Max Sugar

SELF AND IDENTITY IN MODERN PSYCHOLOGY AND INDIAN THOUGHT
Anand C. Paranjpe

WILHELM WUNDT IN HISTORY: The Making of a Scientific Psychology
Edited by Robert W. Rieber and David K. Robinson

HEINZ WERNER AND DEVELOPMENTAL SCIENCE

Edited by

Jaan Valsiner
Clark University
Worcester, Massachusetts

Kluwer Academic / Plenum Publishers
New York, Boston, Dordrecht, London, Moscow

Library of Congress Cataloging-in-Publication Data

Heinz Werner and developmental science / edited by Jaan Valsiner.
p. cm. – (PATH in psychology)
Includes bibliographical references and index.
ISBN 0-306-47909-5
1. Werner, Heinz, 1890- 2. Developmental psychology–History–20th century.
I. Valsiner, Jaan. II. Series.

BF109.W43H45 2005
150′.92–dc22 2004054838

ISBN 0-306-47909-5

233 Spring Street, New York, New York 10013

http://www.kluweronline.com

10 9 8 7 6 5 4 3 2 1

A C.I.P. record for this book is available from the Library of Congress.

Printed in the United States of America

CONTRIBUTORS

Dr. Rober Baker, late of Clark University, Worcester, MA

Dr. Sunil Bhatia, Connecticut College, New London, CT

Dr. Roger Bibace, Clark University, Worcester, MA

Dr. Sandor Brent, Santa Fe, NM

Dr. Louis Carini, Bennington, VT

Dr. Leonrard Cirillo, Clark University, Worcester, MA

Dr. Jack Demick, Worcester, MA

Dr. Marion Glick, Yale University, New Haven, CT

Dr. Irv Hurwitz, Boston College, Chestnut Hill, MA

Prof. Dr. Ingrid E. Josephs, Katholieke Universiteit Nijmegen, Nijmegen, The Netherlands

Dr. Kurt Kreppner, Max-Planck-Institut fur Bildungsforschung, Berlin, Germany

Jennifer Lane, Clark University, Worcester, MA

Dr. Jonas Langer, University of California at Berkeley

Mariola Magovcevic, Clark University, Worcester, MA

Dr. Arnold Miller, The Language and Cognitive Development Center, Boston, MA

Dr. Thomas B. Mulholland, Lunenburg, MA

Dr. Ulrich Müller, Pennsylvania State University, University Park, PA

Becca Solomon, Clark University, Worcester, MA

Dr. René van der Veer, Leiden University, Leiden, The Netherlands

Dr. Seymour Wapner, late of Clark University, Worcester, MA

Dr. Edward F. Zigler, Yale University, New Haven, CT

PREFACE

This book is a major project to satisfy my intellectual curiosity. In 1997 accepted the offer of becoming a faculty member of Clark University with a query in my mind—how has it been that the rich traditions of two psychologists who had played key roles at Clark—Heinz Werner and G. Stanley Hall—have become well recognized but not developed further. The richness of the empirical work done at Clark at the times of both of them has been astounding. The ideas themselves—in the theoretical vein—are potent for many new directions that could establish developmental science in all its rigor as a basic way of knowing (***Wissenschaft***). Yet instead of further development what has happened is a case of glorious stagnation. The work of both Werner and G.S. Hall is widely recognized as belonging to the history of psychology— and the glory allotted to them this way effectively blocks their ideas from being used in furthering the discipline.

Since I have revolted against the glorification of anybody as a means of social neutering of the ideas, it occurred to me that a careful investigation of the development of these ideas within their social contexts—of the societies at large, and of Clark University as a microcosm—was in order. This book accomplishes this ambitious goal in respect to the contributions by Heinz Werner and his intellectual family of colleagues and students. The work on G.S. Hall and his era is still ahead.

The present book is the next step in the *genre* of analyzing history of a science—in this case that of psychology—as a tool for further innovation. Not repetition of the past, nor precise following of the gurus of the past (that activity fits religions, not sciences), but creative synthesis of selected ideas of the thinkers of the past for the sake of future development of science. I am fully aware of the long-existing belief—especially in the physical sciences—that history cannot illuminate the future of the science. I fully disagree. It depends, of course—how history is brought to function in its innovative role. My work to analyze the productive role of psychology's history owes much for the two decades of collaboration with René van der Veer, with whom together we have created the general perspective of intellectual interdependency while working in-depth on the ideas of Lev Vygotsky (van der Veer & Valsiner, 1991)

and other socio-genetic thinkers—George Herbert Mead, Pierre Janet, James Mark Baldwin (Valsiner & van der Veer, 2000). Along similar lines, the series of issues of ***From Past to Future: Clark Papers on History of Psychology*** (published since 1998) has been exploring the ideas of Arnold Gesell, Tamara Dembo, Zing-Yang Kuo, Karl Bühler and Alexander Chamberlain in a similar *genre*.

I have been lucky to encounter a fertile intellectual environment at Clark for this endeavor. Si Wapner's meticulous preservation of materials about Heinz Werner—not the least important of which is the preservation of his personal library and making it available for interested scholars as a part of the resources of Clark's Frances L. Hiatt School of Psychology has been most helpful in preparation of this book. I am always amazed to find new relevant nuances while looking through all of the original papers—including mundane records such as legal efforts of Werner to get paid by German government for years after his expulsion in 1933—all well preserved thanks to Si's dedication. Roger Bibace and Bob Baker have directed me towards usually unexplored sides of Werner's legacy, and Len Cirillo has corrected my excesses in looking at those. Thanks to the whole Department—including people who were here in the 1950s with Werner, and others for whom Werner's ideas were somewhat external superimposition—has taught me about the intricacies of the intellectual atmosphere. A discussion that looks lively and enlightening from outside may be a *corrida* for the insiders—who exchange the roles of the toreador, matador, and the bull in a way that cannot be discerned. At the same time, the ideas used in that game as weapons could be re-made into intellectual ploughshares—if the *telos* of intellectual interchange points towards new understanding of issues, rather than reification of some principles of truth. A very special gratitude goes to the late Richard Lazarus who, eight days before his passing, found the time to respond to my letter inquiring about his views on the life of the psychologists at Clark in the 1950s.

Working on this project has taken five years—well spent in this intellectual exercise. I hope that the results of this collective effort—uniting personal memories, analyses of ideas and their expansions, and bringing out to the public previously unknown controversies—stimulates the readers to return to Heinz Werner's empirical work and theoretical synthesis. I find Werner's contributions a central catalyst for all developmental science of the 20th century, and hope that in this new century we return to the future of their productive use.

Jaan Valsiner

Worcester, Ma.
April, 2003

REFERENCES

Valsiner, J., & van der Veer, R. (2000). ***The social mind: Construction of the idea.*** New York: Cambridge University Press.

Van der Veer, R., & Valsiner, J. (1991). ***Understanding Vygotsky: A quest for synthesis.*** Oxford: Basil Blackwell.

CONTENTS

General Introduction: Developmental Science in the making:
The role of Heinz Werner 1

Jaan Valsiner

Basic Life Course: Heinz Werner 19

PART I. THE EUROPEAN ROOTS RE-EXAMINED

Chapter 1
The Context of the Formation of Heinz Werner's Ideas 25

Ulrich Müller

Chapter 2
Heinz Werner and the Psychological Institute in Hamburg 55

Kurt Kreppner

Chapter 3
The Making of a Developmental Psychologist 75

René van der Veer

PART II. TOPICS IN DEVELOPMENT: WERNER IN NORTH AMERICA

Chapter 4
Metaphor and Perception 109

Leonard Cirillo

Chapter 5
Re-Thinking Development 121

Bernie Kaplan—in interview with *Ingrid E. Josephs* and *Sunil Bhatia*

Chapter 6
The Sensory-Tonic Field Theory of Perception 155

Seymour Wapner

PART III. THE WORLD AT CLARK: DEVELOPMENT OF THE CONTEXT

Chapter 7
The Clark Years: Creating a Culture 181

Jennifer M. Lane, Mariola Magovcevic and *Becca K. Solomon*

Chapter 8
Heinz Werner: Mentor and Mensch 201

Thomas B. Mulholland

Chapter 9
Werner: Orthogenesis as Life Style 207

Irving Hurwitz

Chapter 10
Heinz Werner, My Spiritual Grandfather: A Little Giant with Transparent Blinders 213

Sandor Brent

Chapter 11
Feeling for Others: Werner's Interpersonal Style 221

Robert Baker

Chapter 12
Personal Experiences with Heinz Werner at Clark University 225

Arnold Miller

Chapter 13
Werner Recollected 229

Leonard Cirillo

Chapter 14
Relating to Dr. Werner: Past and Present 235

Roger Bibace

PART IV. TRANSFORMING WERNER'S HERITAGE

Chapter 15
The Theory of Phenomenal Psychology 261

Louis Carini

Chapter 16
Critical Person-in-Environment Transitions Across the Life Span 285

Seymour Wapner and *Jack Demick*

Chapter 17
The Primate Phylogeny of Cognitive Ontogeny 307

Jonas Langer

Chapter 18
Werner's Developmental Thought in the Study of Adult Psychopathology ... 323

Marion Glick and *Edward Zigler*

Chapter 19
Heinz Werner: Catalyst for a New Way of Understanding and Treating Children on the Autism Spectrum 345

Arnold Miller

General Synthesis: Recurring Agendas: Integration of Developmental Science 391

Jaan Valsiner

Index 425

GENERAL INTRODUCTION

DEVELOPMENTAL SCIENCE IN THE MAKING: THE ROLE OF HEINZ WERNER

Jaan Valsiner

> ...man, destined to conquer the world through knowing, starts out with confusion, disorientation, and chaos, which he struggles to overcome. This struggle is a never-ceasing process, continuing throughout life: man's objects are always touched with a coefficient of indeterminacy and, as long as he is open to new environments and experiences, they are constantly in the process of transformation, changing in their significance. One may indeed say that man lives constantly in a world of becoming rather than in a world of being. (Werner & Kaplan, 1963. p. 13)

The general issue of development—becoming—has been the basic unresolved question of science. Different scientists have tried to solve it over the past two centuries—unsuccessfully. Yet their efforts—scattered over biology and psychology—are worth examining since new solutions to old problems can emerge from knowing about the previous impasses.

This book is about Heinz Werner's developmental ideas and their social contexts—both of his lifetime, and of our present day. Werner's own life and history of thought were filled with needs to adapt to new settings, episodes of indeterminacy following periods of stability in life, and—continuity in basic developmental thought. It could be said that Werner painted a consistent picture on the canvas of developmental psychology in the 20th century—the roots of which were in Continental European thought. He did it as an experimenter who was interested in basic human psychological processes—perceiving and meaning-making. The resulting canvas is rich in details—yet integrated by the one single general idea—differentiation of developing systems.

WERNER'S LEGACY

Werner's role in developmental science of the 20th Century has been pivotal—it unites European and American traditions in psychology. It brought together psychology, anthropology, biology, and psychiatry in a framework that in our time we recognize as interdisciplinary. And—in the social context of psychology in North America—it did create a distinctive "Clark school" of psychology in the second half of the 20th Century. In fact, it could be considered the "Second Clark School" that Werner's ideas helped to establish in the 1950s—the first being the tradition of G. Stanley Hall at the turn of that century. Werner probably would have frowned at the idea of his creating a "school" at Clark—as his focus was on basic ideas and their experimental study, rather than the social positioning of different traditions.

Werner's tradition—viewed by others in the North American context as a "school of thought"—unified theoretical width with carefully scripted empirical foci. So it was a "school" in the sense of empirical research tradition (even half century later a number of dissertations at Clark on empirical topics recite the "orthogenetic principle"). Yet it was not a "school" in the sense of basic developmental ideas—which were the core of all *Naturphilosophie*, *Ganzheitspsychologie*, and philosophical ideas of development from Goethe to Cassirer were translated into epistemological practices. Not surprisingly the presence of a psychological orientation in the social context of North American societies that focuses on the wholes—yet studies these wholes through carefully built experiments and innovative construction tasks—is a kind of a special case. Hence the "Clark tradition" of Werner has received a reputation for producing scholars capable of sophisticated theoretical thinking. This is particularly crucial in our present time where psychology faces one of its recurrent crises—lack of new theoretical breakthroughs combined with exponential growth of the corpus of empirical data.

GOALS OF THIS BOOK

It is precisely now—decades after Werner's ideas became known in the United States in the 1950s—that our contemporary efforts to build a developmental science may benefit from an analytic take into the history of the ideas of similar kind. However, a new look at Heinz Werner's legacy cannot be simple. This book is a collective, multi-voiced whole. We bring together different students of Werner and find out how they reflect back on their experiences—and how they have advanced developmental ideas in new ways. Some of these students have continued to follow Werner's ideas explicitly—while others have taken these ideas to areas where they are transformed into new forms. Contributors also include scholars who look at Werner from perspectives other than that of belonging to the "Wernerian school". Personal reminiscences and scholarly contributions are purposefully intermingled in the book to give the readers a flavor of the human realities of science.

Three Objectives

The book has three goals. First, we will provide a systematic analysis of Heinz Werner's intellectual history as his life course includes the historically necessitated change of his cultural worlds—from the Old to the New. The new focus on Werner's ideas is especially concentrated on the European Period of his work, since there we can observe the creative contributions to science by Werner's phenomenological interests in language, perception, and music with the grand theoretical schemes that emerged in parallel from Hamburg between the two world wars. Aside from Werner's own step by step elaboration of the general differentiation and hierarchization theory (later labeled "the orthogenetic principle"), the other grand theoretical syntheses that emerged from Hamburg in the 1920s–30s were the personological system of William Stern, the theoretical biology of Jakob von Uexküll, and the philosophy of symbolic forms of Ernst Cassirer. Werner participated in the making of these traditions—and these traditions in the making played a role in Werner's theory.

Secondly, Werner's scholarly productivity in America—as he had his ups and downs in finding academic positions—continued in new ways. Werner lost the security of professorship in Hamburg and had to move from one temporary position to another—until setting down at Clark in 1947. During these years of no stable position, his empirical orientation became extended in the direction of study of children with various "blockages" or ordinary development. The empirical work done at Wayne County Training School had a major impact upon his development of the notion of rigidity. At Clark, Werner's presence created a new synthesis in a local scientific culture. His Continental European-based epistemological orientation towards seeing the differentiation of wholes into new organized systems became elaborated by his American colleagues and students through a rich empirical research program. That program has left a permanent mark into psychology in the United States in two ways—by recognizing the relevance of the whole ahead of its parts, and by providing different scientists who got their education with Werner at Clark to move productively to new areas of expertise. The latter are particularly relevant—while it is easy to detect the influence of the thinking of a major scholar upon those who proclaim to be his (or her) followers, it is the other kinds of disciples—the ones who do not glorify the father (or mother) figure and develop new ideas in new areas, who specify the actual breadth of the scholarly influence.

Thirdly—and perhaps most importantly for the making of Developmental Science at our time—Werner's legacy provides a systematic set of ideas for the future that may allow developmental scientists to avoid the traps of thought that have proven unsuccessful in the past. Similarly to other seminal developmental scientists of the past century—such as Jean Piaget and Lev Vygotsky—Werner's contributions leave many unanswered questions. Developmental Science returns to those—but hopefully with the knowledge of the efforts that took place in the past.

THE MAKING OF DEVELOPMENTAL SCIENCE: AGAIN!

What is "developmental science"? It is a curious phenomenon in contemporary psychology that we need to talk about the *making* of developmental science at all (Cairns, et al, 1996). After all, the developmental focus in biological sciences antedates the emergence of modern psychology by a few decades—if we consider Karl Ernst von Baer's ***Entwicklungsgeschichte der Thiere*** (von Baer, 1828) as the beginning of developmental focus in biological sciences, in contrast to the emergence of psychology in 1860s–1870s (by the *Völkerpsychologie* efforts of Moritz Lazarus and Heymann Steinthal and the move into experimental psychology by Wilhelm Wundt). Yet in the history of psychology the developmental focus has emerged, disappeared, re-emerged, and then again disappeared—in a somewhat monotonic pattern (Cairns, 1998; Valsiner, 1998). It is as if some very powerful set of phenomena—which issues of development are—is wrestling for its place among the legitimate objects of scientific scrutiny. Yet the received norms of how science is to proceed seem to eliminate the core of the phenomena—development—from consideration. The study of developmental processes is easily being replaced by investigation into outcomes of these processes (cf. Werner, 1937). Hence the recurrent need for a distinct discipline—such as Developmental Science—that attempts to maintain focus of researchers on development.

In its newest reincarnation, Developmental Science is

> ...a general orientation for linking concepts and findings of hitherto disparate areas of developmental inquiry, and it emphasizes the dynamic interplay of processes across time frames, levels of analysis, and contexts. Time and timing are central to this perspective. The time frames employed are relative to the lifetime of the phenomena to be understood. Units of focus may be as short as milliseconds, seconds, and minutes, or as long as years, decades, and millennia. In this perspective the phenomena of individual functioning are viewed at multiple levels—from the sub-systems of genetics, neurobiology, or hormones to those of families, social networks, and cultures. (Carolina Consortium on Human Development, 1996, p. 1)

In short—contemporary developmental science is a focus on the basic processes of development, recognizing its multi-level, multi-trajectory, and probabilistically epigenetic nature (Gottlieb, 1997). Yet it is not new—there have been various efforts to create developmental science before, as the legacies of William Preyer, G. Stanley Hall, Lev Vygotsky, Arnold Gesell, Jean Piaget, and Heinz Werner demonstrate (Cairns, 1998). Possibly the recurrent returns to issues of development have even longer history—going back to Goethe's *Metamorphoses* (Werner, 1926, p. 32) as well as to the work of Jean-Baptiste Lamarck. Basically all of developmental biology, evolutionary theory, and natural philosophy of the past two centuries is attempting to make sense of development.

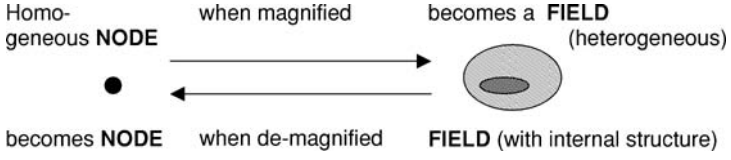
Development as an Object of Investigation

In the common-sense set of meanings—reflected in dictionaries—we can find more than a dozen meanings, including the notion of bringing something into existence, causing progress from simple to complex, unfolding, elaboration of a theme, and progressing to an advanced stage (Valsiner & Connolly, 2003, p. ix). Development entails some kind of change across time that may lead to qualitatively new organizational levels of the organism. Development is a life long process from conception to death—and as such constitutes a historical phenomenon.

The crucial issue in conceptualizing development is its direction—***telos*** (see Kaplan, Bhatia & Josephs, this volume). It has been a target for many ideological disputes—since recognizing directionality of development is at times seen as a remnant of pre-formist belief systems. Yet there is a big difference between viewing development as oriented towards some future direction (but not determined by it), and claiming that the end point of development is known and fixed. Contemporary efforts of the dynamic systems theory to use the notion of attractors—points or regions towards which ongoing processes converge (Valsiner, 2002), as well as efforts in cognitive developmental psychology to view directionality as a process of moving *away* from a previous state (Chapman, 1988) are all efforts to conceptualize directionality of development.

Secondly, issues of development center on the relations between **structure** and **function** of the organism and its relations with the environment. The notions of structure—of the organism and of the environment—are descriptive terms. They take two kinds of forms—nodal or field descriptions of the structure. The first describes a system through a graph of interconnected nodes. The other—through fields that may be differentially structured and may entail directionality through the utilization of vectors related with different parts of the field (Gurwitsch, 1922; Dickson, 2002; Lewin, 1938; Smith & Smith, 1996).

The two ways of describing relational processes are mutually embedded. The node description is a special case of field description—where the boundaries of the fields are distanced from one another and the field structure is shrunk to the form of a node:



Use of node-type structural descriptions of either the organism or the environment provides no explanatory possibilities other than inherent invention of causal essences (e.g. "the person solving problem X does so because of ability for X"), or causal statements about some other node-like theoretical entity (e.g.

"Y [environment] causes X"). To avoid invention of either inherent or external essentialist explanations, theorists who explain development in terms of node relations resort to some version of mutuality claim ("transactionism", "interactionism" etc.). The entities—depicted as nodes—are viewed as in constant mutual relation. Yet the descriptions of such relations become node-like entities as well—the explanation of the linkages can easily take a form of descriptive labeling (e.g. the use of "coordination" in Dewey, 1896). In contrast, conceptualization of development in terms of field constructs creates formal terminology that allows for abstract accounting for immediate interdependencies within the system and its environment. What has been a complicated issue for existing field theories is the depiction of the directions of the transformation of the field, as well as its multi-level organization.

Thirdly, the study of development entails the notion of **hierarchical ordering** of the organism (and of the environment). The acceptance of the notion of hierarchy as a form of organization has been disputed in the social sciences of the past century, under the heavy influence of extra-scientific (democratic) ideal discourse. In contrast, evolutionary biology necessarily accepts the notion of hierarchy—some species are at higher level of organization of their adaptation than others. Within the organism, the structure occurs in the form of functional hierarchy where lower level operations are subordinated to a higher level of organization. It needs to be noted that organisms (or levels of operation within an organism) that are of higher level in contrast to those of lower levels need not be in any evaluative sense "better" than others. Hierarchical organization is a neutral form of relation—a system within which at least one part is in relations with at least one other part that subordinates the latter to the former. There are various kinds of hierarchical relations possible—ranging from transitive to intransitive forms (Valsiner, 1998, p. 217). It is the latter that are usable in developmental science.

Fourthly—the most important feature of development is the **emergence of new forms**. All the three previous characteristics are insufficient to make developmental science developmental. In terms of James Mark Baldwin—who formulated his "positive postulate" for developmental science

> ... that series of events is truly genetic [developmental] which cannot be constructed before it has happened, and which cannot be exhausted backwards, after it has happened. (Baldwin, 1906, p. 21)

The "positive" nature of this postulate is in its focusing of the study of development on that of the unfolding novel processes, rather than their prediction, or retrospective explanation. The phenomena of **emergence**, **becoming**, and **transformation** become the objects of investigation.

Centrality of Synthesis

All developmental phenomena entail processes of synthesis—emergence of new qualitative structure on the basis of previous structures. There are a number of ways to consider such synthesis:

—as a novel combination of previously known elements, which, in new configuration, establish a new whole (the way suggested by Wilhelm Wundt in his notion of *schöpferische Synthese*).
—as a transformation of a previous whole into a new—more, or less, structured one. Piaget's focus on equilibration is perhaps fitting here, and so is Werner's.
—as a transition of a structural state under stress—far from its equilibrium—into a new state. Here the traditions of thermodynamics (Ilya Prigogine, 1973) can be mentioned.
—as formally described through mathematical models of abrupt changes where quantified increases lead to qualitative novelty. The traditions of catastrophe theory models (Rene Thom) belong here.

Contemporary developmental science shows no clear dominance of any of these four ways. While there is increased flirtation with the "order-out-of-chaos" ideas borrowed from contemporary thermodynamics, their actual implementation in psychology remains purely formal. Wundt's ideas have been—unfairly—dismissed as "too old", and Piaget's rich heritage seems to become too vague for the minds of new generations of researchers whose bright eyes are turned towards technology. Our new power tools—such as fMRIs and the like—allow us to ask new questions if we are ready for those—or repeat old questions in technically new forms. In the latter case no progress is made.

Implications for Development of Ideas

It is quite ironic that in the context of contemporary advances in Developmental Science (and while analyzing the ideas of Heinz Werner in this book)—we are again faced with an unsure prediction for the social maintenance of developmental ideas. The developmental science that began to grow in the 1990s may become extinct in the near future. This can—as it has been in the past—be the result of loss of focus on its subject matter (development) and its failure to create new methods for its study.

However, there is a wider issue to consider. Psychology as a whole has become empirically hyperproductive and theoretically mute—the ideas that are currently presented as "theories" are local, data-driven and methods-based (Gigerenzer, 1993)—rather than pertaining to general questions about the basics of the human *psyche.* One can speculate about the reasons for such change over less than a century—blaming easy social scapegoats ("e.g., "post-modernism") for such change. What has become changed are the **relations between** theory, data, and phenomena—from the ideal of integrated whole ("methodology cycle"—Branco & Valsiner, 1997) to that of dominance of method over phenomena—under the nominal label of a conventionally accepted "theory" or "system". Thus, empirical studies utilizing standardized tests—and using factor analysis as the method of data analysis while claiming to belong to "***the*** vygotskian" tradition cannot be

compared with the efforts of Vygotsky, Piaget, or Werner to use abstract theoretical concepts to make sense of development in its generic form.

It is at the point of such danger of loss of generality of science that a new look at the theoretical and empirical contributions by Heinz Werner and his many colleagues might be intellectually stimulating. Werner's ideas are in many ways close to some other highly revered psychologists of the 20th century—Lev Vygotsky and Jean Piaget in particular. Intellectual interdependence between the three is clearly demonstrable. One could speculate what would have been the fate of Piaget's and Vygotsky's ideas had they—rather than Werner—been forced by historical circumstances to migrate from Europe to North America and set up their intellectual worlds here. There are no simple answers—yet it is most likely that the fascination with "piagetian" and "vygotskian" perspectives that became evident in the social scene of psychology and education in the U.S. in the 1960s–70s and 1980s–90s, respectively, would have been very different. Would the "orthogenetic principle" have been imported as a solution for most ailments in the U.S. educational system—instead of "zone of proximal development"? And the latter perceived as "too theoretical" a concept developed by a separate group of outsiders to the "mainstream"—in some small U.S. university? The paths of the social roles conceptual systems in a discipline play are worthwhile to study in themselves—how the "epistemic markets" (Rosa, 1994) rise and lower the values of different conceptual system is filled with ironic surprises of the history of science.

A GENERAL OVERVIEW OF WERNER'S CONCEPTUAL SYSTEM

Heinz Werner created his conceptual system slowly, systematically, and in the course of a life trajectory that spans two continents and one major period of World's social turmoil. Werner was both an experimentalist and theoretician. He unified both the potentials of the Old and New Worlds' intellectual backgrounds—and was vulnerable to the limitations of both. His work was benefiting from inputs on behalf of the best synthetic thinkers in philosophy (Ernst Cassirer) and biology (Jakob von Uexküll) of the 20th century—together with links to the most thoroughly developmental directions of holistic psychology (Felix Krueger's "Second Leipzig School"—Krueger, 1915) and the classic work of cognitive and language processes of Karl Bühler and the "Würzburg school". Werner carries forth the *Naturphilosophie* traditions of Johann Wolfgang Goethe, who is said

> ... to array his observations of a living, growing form in terms of an imaginative, dynamically experienced, inner spatial unity (an inner time-space image), and, in being able to move around and back and forth within it, to get a sense of the *meaning* of each of the momentary spatial configurations, according to their place or position in relation to all the others within the whole. He wants an inner, synoptic sense of a living thing's life course, a sense of the inner space of its life possibilities. (Shotter, 2000, p. 241).

Quite explicitly, Werner's notion of the orthogenetic principle (see Kaplan, Bhatia and Josephs, below) goes back to Goethe (Werner, 1926. p. 32, 1940, p. 40). Werner's work systematized the basic ideas of developmental thought over the past two centuries, while offering new alleys for encounters with reality. Werner's perspective in psychology clearly prioritized field-theoretical constructs over node-based constructs (see above):

> The position that seems to me most fertile... requires the abandoning of the widespread notion of a duality between person and field, irrespective of whether "field" pertains to a domain of objects or people. If one attempts to study the functioning of the individual in regard to his social climate or objective environment it seems to me that even the often used formulation of this relationship in terms of an "interaction" of two somehow "given" entities may be questioned; I deem it to be so much more fruitful to think here rather in terms of a growing polarization within a primary entity entailing the molding of not-yet-formed raw material into a self versus a field of objects and of "others" (Werner, 1962, p. 14)

Of course Werner was not a mathematician—a topologist who could have given an abstract formal existence to the field-theoretic underpinnings that came to Werner the phenomena-oriented experimentalist. It is not surprising that all kinds of field-theoretic solution efforts—Kurt Lewin's, Heinz Werner's, C. H. Waddington's, and others'—were lost in the social history of the discipline. Psychology has failed to integrate itself with mathematics—and has succumbed to the empire of statistical manipulations instead (see Gigerenzer et al., 1989).

Werner's Look at Developmental Psychology

Werner's notion of development was established in the 1920s as part of the general discourse about that topic—similar to that from where Lev Vygotsky and Karl Bühler gained their perspectives of critique of the essentialist, meanings-phobic, and non-developmental psychology (Bühler, 1927; van der Veer & Valsiner, 1991). Werner's focus sounds very close to our contemporary developmental science:

> Formally considered,... developmental psychology has two basic aims. One is to grasp the characteristic pattern of each genetic level, the structure peculiar to it. The other, and no less important one, is to establish the genetic relationship between these levels, the direction of development, and the formulation of any general tendency revealed in developmental relationship and direction. The discovery of the structural pattern of the isolated mental level. Whether we are concerned with the development of the individual from childhood to maturity or with the development of the human race, etc., is one genetic problem. Complementary to it is the task of ordering the genetic relationships between particular levels. (Werner, 1940, p. 5)

The crucial focus of genetic (i.e., developmental) analysis is that of finding the process mechanisms that lead to outcomes (Werner, 1937). In the most general

terms, that process is the unity of **differentiation** and **hierarchization** (increasing sub-ordination—Werner, 1940, p. 41). Since both of these notions include their own opposites—differentiation includes de-differentiation, and hierarchization—de-hierarchization (reduction of hierarchical organization), developmental processes are open-ended in their constant movement between states of quasi-differentiated and quasi-hierarchical complexive (syncretic) states towards other states—lower or higher in the depth of hierarchical sub-ordination.

Werner's Methodological Credo

Werner was primarily an experimentalist who wove empirical evidence from any applicable source into a general developmental theoretical scheme. Largely in line with the ideas of the Second Leipzig School of Felix Krueger and his colleagues, Werner focused on the emergence of structure out of the quasi-differentiated field. Hence he added his counter-voice to Wilhelm Wundt's focus on creative synthesis (*schöpferische Synthese*—emergence of new forms from re-combination of elementary constituents) by giving primacy to the analysis of differentiating wholes:

> Psychology, including ethnopsychology, must proceed from larger living unities and arrive by analysis at unities of a lower order. It is not the concept of "creative synthesis" but that of "creative analysis" which leads to fruitful results. The component members of a mass are dependent parts of this mass, which represents the real, living unity. The single man as a member of a generic unity possesses characteristics which are his because of his integration within a totality, and are intelligible only in terms of this totality. The problem of generic unity can be solved only by conceiving this unity to be a non-derivative whole governed by special laws which affect the human bearers of this unity in their role of dependent members. (Werner, 1940, p. 9; 1926, p. 10)

The primacy of the whole is reinstated as a methodological starting point. From here follows the central focus of Werner's methodology—the study of individuals not as individuals (in their uniqueness, idiosyncracy, etc), but—while recognizing such individuality and capitalizing upon it—the whole is what matters:

> The individual thinks, speaks a certain language, and acts in a characteristic way because of his participation, his integration, in the whole; and his thinking, talking, and acting are primarily understandable only in so far as he is identified with this totality. (Werner, 1940, p. 9, 1926, p. 10)

The targets of science—and developmental science in particular—are the general laws. These laws become known to us through episodic and particular encounters with psychological phenomena. Yet the issues at stake are those of basic universal science—not those of getting to know the particular context in some post-modern incarnation.

Developmental Experiments: Testing the "Upward" and "Downward" Movements

Werner considered two types of developmental (in his terms—genetic) experiments as the core for methodology.

First, it is possible to follow the formation of ordinary psychological functions—either in a laboratory under artificial conditions, or in the natural settings. This is made possible by the axiomatic focus on psychological events as **unfolding processes** (Werner, 1940, p. 37). The time frame of such processes may vary—from percept formation within a fraction of a second to the emergence of intellectual events over days, months, or years. Yet their basic pattern—that of becoming of new organizational forms—is similar across domains. Werner was a co-founder—with Friedrich Sander and Günter Ipsen—of the microgenetic experimental tradition in psychology (Valsiner & van der Veer, 2000, chapter 7).

Secondly, it is possible to study developmental processes through **genetic experiments on primitivation**. Such experiments can be made due to the vertical heterogeneity of already the established organizational forms:

> ... normal adult, even at our own cultural level, does not always act on the higher levels of behavior. His mental structure is marked by not one but many functional patterns, one lying above the other. Because of this the isolated individual, genetically considered, must occasionally exhibit in his varying behavior different phases of development (Werner, 1940, p. 38)

It is obvious that the two methodological schemes—looking at the "upwardly emerging" forms of organization, and at "downwardly occasional" functioning at lower levels—follow from the general notion of development as differentiation and hierarchization. The investigator can observe naturally occurring movements in either of these directions, or can evoke either of them through experimental intervention.

Two Basic Themes: Perception and Language

Werner's interests began from his own musical education—but transcended it in the direction of study of perception and construction of melodies, speech utterances, and graphic symbols. Yet the very basic feature of human relating with the environment—perception—remained the core of his approach (Werner, 1955, p. 12). The critical contrast is between holistic perception processes involving both the environment and the perceiver (**physiognomic** perception) and "geometric-technical" fact of perception of properties of objects.

Werner introduced the notion of physiognomic nature of human functioning in 1926 at the 8th International Congress of Psychology in Groningen (Werner, 1927). It grew out of his basic roots in *Ganzheitspsychologie* tradition. Over his three basic life periods—Hamburg, Wayne County, and Worcester—these directions developed into two basic research streams—on **perceptual processes** (see chapters by Cirillo,

Carini, Wapner, below) and **symbol formation** (see chapters by Kaplan, Bhatia & Josephs; Miller).

The **sensory-tonic field theory** of perception (Werner & Wapner, 1949, 1956—see overview of the empirical projects in Wapner, this volume) was the framework for the majority of experimental studies conducted by Werner's disciples at Clark from the 1950s onwards. Its roots are deeply embedded in the field-based synthesis notion of *Ganzheitspsychologie*—"interaction" between motor and sensory factors can be viewed as differentiating from a whole field (Werner & Wapner, 1949, p. 90). Furthermore, the basic concept of the theory—tonus of the body—was taken from Kurt Goldstein's theory of the organism and based on neuropsychological knowledge base (Goldstein, 1939).

The sensory-topic theory provided an alternative to psychological explanations promoted by psychoanalysis—by conceptualizing the notion of energy transformation without any link with the posited substrate (libido). It also provided a rich ground for a myriad of clever experimental studies that demonstrated how the person's bodily system is in a relation of equilibrium with the surrounding sensory environment. All these studies were done utilizing the appropriate statistical techniques of the 1950s, when analysis of variance began its path to power in American psychology as a whole.

The **symbol formation** direction in Werner's thought was exemplified by the classic book on that topic (Werner & Kaplan, 1963). This book could be considered a presentation of the work done in the 1950s at Clark on the issues of semiotic (in Werner's terms—symbolic) distancing of the psychological functions from the immediate, here-and-now, contexts. The work on symbol formation continued the person-centered focus that Werner carried with him from his Hamburg times—yet with the addition of new connections with post World-War-II linguistics. The story told in it is that of the elaborated structure of distancing. Human beings—in their ontogeny—are involved in constant **overcoming of the immediacy** of their situated activity contexts through **semiotic construction**.

Werner himself did not use the notion of semiotics—yet the focus on symbol formation is a clear indication of his semiotic (or ***sematological***—to use Karl Bühler's parallel term) interests. His focus was on the act of speaking as the place where symbolic vehicles are constructed. Thus, in the course of human development

> . . . there is a progressive distancing or polarization between person and object of reference, between person and symbolic vehicle, between symbolic vehicle and object, and between the persons in the communicative situation, that is, the addressor and the addressee. (Werner & Kaplan, 1963, p. 42)

This focus on distancing is clearly developed by 1963 beyond the shape it took in the 1940s. In this earlier version, distancing emerged as a concept used to address the issue of transition from "primitive" to "cultivated" personality organization (e.g., Werner, 1940, pp. 404–412). By the end of Werner's European period—and in his early American years—his focus was on the phenomena that

were near the "primitivity" complex and only creating the bases for differentiation into elaborated new wholes. The major focus—in fact culmination of the coverage—in ***Comparative Psychology of Mental Development*** is in the analysis of "primitive personality"—rather than its "cultivated" counterpart (***Kulturmensch***—see Werner, 1940, chapter 13). In contrast, ***Symbol Formation*** moves the coverage to the structure of organization of the activity of speaking. In some sense there may be a formal parallel between the focus on construction of signification in human speech in its many forms, and Werner's early interest in children's construction of melodies.

The elaboration of the distancing notion can be considered an intellectual domain in which the "Clark years" added substantively to what was already set up for further differentiation of ideas in the European period. What is interesting is that the focus on symbol formation excluded empirical investigations of ontogeny over the first five years of children's lives.[1] Instead, the evidence about the beginnings of symbol formation come from the observations by the Sterns on their children—Günther and Hilde–and from other earlier diary recordings known to child language researchers.[2] It was the middle childhood meaning construction data, as well as those from adults and psychiatric patients, that came from the "Clark years" (based on theses and dissertations of Margery Bodansky-Franklin, Arnold Miller, Leonard Cirillo, Robert Baker, Edith Kaplan, Alfred Goldman, and Sybil Speier-Barton). Werner's focus on testing relevant theoretical arguments through look at the formal parallels between ontogeny, phylogeny (and human cultural history) and microgenesis are a continuous way of analyzing key issues. He was remarkably up-to-date in his grasp of the relevant research literature in different areas of investigation.

SCIENTIST IN THE MIDDLE OF THE TUMULTUOUS WORLD

Werner persevered as scientist despite the dramatic upheaval of his life course in 1933—when the Nazi regime terminated his professorship at Hamburg University (see Kreppner's chapter, below). Becoming a reluctant emigré led him into a period of uncertainty of a clear basis for his scientific work. Arriving in the United States at a time of economic hardships led to an enforced temporary exit from university teaching (see Franklin, 1990, pp. 178–179 for a description). While in Germany Werner was viewed as a left-wing intellectual and accused by the regime

[1] Werner did advise his colleagues in Hamburg—Marta Muchow in particular—on issues of infant behavior [see Werner & Kaplan, 1963, p. 512—reference to an unpublished paper by Muchow and Werner on infant behavior, 1930]. Yet there are no direct empirical studies known where he would study very younf children. The earliest ages he dealt with were 2–5 year olds—children who invented songs (Werner, 1917)—see van der Veer, this volume. This study comes from the very beginning of his academic career.

[2] With two exceptions—Bernard Kaplan's son is described at age 13 months, and Si Wapner's report on a 22 month old child is included (Werner & Kaplan, 1963, p. 86 and p. 102, respectively).

for being "pro-Jewish", in America he encountered restrictions set to limit the competition for academic positions by German refugees. As a result, Werner spent seven years (1937–1944) working as an ordinary research psychologist in practice (Wayne County Training School). Yet that practice led to the major innovation in Werner's "American years"—application of his developmental ideas to the study of mentally retarded children. As will be revealed in the present book, that experience also was the base for Werner's assimilation of the "American way" of reliance on statistical methodology in his empirical research program at Clark in the 1950s. The history of Werner's ideas in their transition from the Old to the New World is an interesting case for seeing how socio-cultural contexts canalize the scientist's thinking.

PREVIEW OF THE BOOK

The present book includes extensive coverage of topics that have usually not been covered in the historical writings on Werner—his European period (in Vienna, Munich, and Hamburg—prior to the enforced exodus from Germany and migration to America. It will be seen (Part I of the book) how Werner's ideas emerged and developed over the two decades (1910s and 1920s) reaching their creative culmination by the early 1930s. By his age 43—time when he had to leave Germany—Werner had made major contributions to developmental thought, had set up a number of creative empirical projects in Hamburg with his co-workers Martin Scheerer, Marta Muchow, and others (see the chapters by Ulrich Müller and Kurt Kreppner, below).

As emphasized above—after leaving Germany Werner had a rather complicated time in the United States trying to gain academic employment. It took him 14 years before he found his place at Clark. In this book we will see how the work done at the Wayne County Training School was relevant for later applications of his work to handicapped children (Part II—Arnold Miller's chapter; Part III—the chapter by Marion Glick and Edward Zigler). While moving from one temporary position to another, Werner maintained his basic credo as an experimental scientist. This credo was crucial all over his career—but most prominently found its relevance in his role in the buildup of the psychology department at Clark in the 1950s (Part II, especially the chapter by Leonard Cirillo). That the social context of Clark University was very special in the 1950s becomes clear from the personal reminiscences and analysis of the "Clark culture" (Part III). That local subculture had its internal dynamics that mimicked the wider social processes that were in vogue in North American psychology at the time. The contrast between clinical and research orientations was being disputed nationally—and that dispute emerged in its local form at Clark (see chapter by Jennifer Lane, Mariola Magovcevic and Becca Solomon). In the 1950s psychology in the U.S. was undergoing the conversion to the use of sample-based statistical methodology. The local world at Clark

was moving in the same direction—uses of analysis of variance and comparisons of averages came into fashion in dissertations, in spite of the misfit of these techniques with basic developmental assumptions that were emphasized by Heinz Werner himself.

Finally, the whole Wernerian tradition has given rise both to direct following of the core ideas as well as to new developments that begin with Werner but lead to notably other directions (Part III—Roger Bibace, Part IV—chapters by Louis Carini, Arnold Miller, and Jonas Langer). There are many new ways to take Werner's ideas further—and the main focus of the present volume is to promote these possibilities through telling a complex story of a scientist in his social contexts. That story—complex and multifaceted one—gives a basis for innovations in our contemporary Developmental Science. Yet there are no ready-made recipes—the reader of this volume will, hopefully, arrive at one's own moments of inspiration while encountering some nuance of Heinz Werner or his ideas in this book.

ACKNOWLEDGMENTS

Suggestions by Nancy Budwig, Ulrich Müller, Roger Bibace and other colleagues on an earlier version of this paper are gratefully acknowledged.

REFERENCES

Baldwin, J. M. (1906). ***Thought and things: A study of the development and meaning of thought, or genetic logic.*** Vol. 1. ***Functional logic, or genetic theory of knowledge.*** London: Swan Sonnenschein & Co.

Branco, A. U., & Valsiner, J. (1997). Changing methodologies: A co-constructivist study of goal orientations in social interactions. ***Psychology and Developing Societies, 9***, 1, 35–64.

Bühler, K. (1927/1978). ***Die Krise der Psychologie.*** Frankfurt-am-Main: Ullstein.

Cairns, R. B. (1998). The making of developmental psychology In W. Damon & R. Lerner (Eds.), ***Handbook of child psychology.*** 5th edition. Vol. 1. ***Theoretical models of human development*** (pp. 25–105). New York: Wiley.

Cairns, R. B., Elder, G. E., & Costello, E. J. (Eds.) (1996). ***Developmental science.*** New York: Cambridge University Press.

Carolina Consortium on Human Development (1996). Developmental science: a collaborative statement. In R. B. Cairns, G. H. Elder & E. J. Costello (Eds), ***Developmental science*** (pp. 1–6). New York: Cambridge University Press.

Chapman, M. (1988). Contextuality and directionality of cognitive development. ***Human Development, 31***, 92–106.

Dewey, J. (1896). The reflex arc concept in psychology. ***Psychological Review, 3,*** 3, 357–370.

Dickson, B. J. (2002). Molecular mechanisms of axon guidance. ***Science, 298,*** 1959–1964.

Franklin, M. B. (1990). Reshaping psychology at Clark: The Werner era. ***Journal of the History of the Behavioral Sciences, 26***, 176–189.

Gigerenzer, G. (1993). The Superego, the Ego, and the Id in statistical reasoning. In G. Keren & C. Lewis (Eds.), ***A handbook for data analysis in the behavioral sciences: Methodological issues*** (pp. 311–339). Hillsdale, N.J.: Erlbaum.

Gigerenzer, G., Swijtink, Z., Porter, T., Daston, L., Beatty, J. & Krüger, L. (1989). ***The empire of chance.*** Cambridge: Cambridge University Press.

Goldstein, K. (1939). ***The organism.*** New York: American Book Company.

Gottlieb, G. (1997). ***Synthesizing nature/nurture.*** Mahwah, N.J.: Erlbaum.

Gurwitsch, A. (1922). Über den Begriff des embryonalen Feldes. ***Archiv für Entwicklungsmechanik der Organismen, 51***, 383–415.

Krueger, F. (1915). Über Entwicklungspsychologie. ***Arbeiten zur Entwicklungspsychologie, 1***, 1 (pp. 1–232). Leipzig: Wilhelm Engelmann.

Langer, J. (1970).Werner's comparative organismic theory. In W. Kessen (Ed.), ***Handbook of Child Psychology.*** 4th Ed. Vol. 1. ***History, theory, and methods.*** (pp. 733–771). New York: Wiley.

Lewin, K. (1938). ***The conceptual representation and the measurement of psychological forces.*** Durham, N.C.: Duke University Press.

Prigogine, I. (1973). Irreversibility as a symmetry-breaking process. ***Nature, 246***, 67–71.

Rapapport, D. (1941). Critical reviews of recent books: Werner, H., Comparative psychology of mental development. ***Journal of Genetic Psychology, 58–59***, 429–434.

Rosa, A. (1994). History of psychology as a ground for reflexivity. In A. Rosa & J. Valsiner (Eds.), ***Historical and theoretical discourse.*** Vol. 1 of ***Explorations in socio-cultural studies*** (pp. 149–167). Madrid: Infancia y Aprendizaje.

Shotter, J. (2000). Seeing historically: Goethe and Vygotsky's 'enabling theory-method'. ***Culture & Psychology, 6,*** 2, 233–252.

Smith, N. W., & Smith, L. L. (1996). Field theory in science" its role as a necessary and sufficient condition in psychology. ***Psychological Record, 46***, 3–19.

Van der Veer, R., & Valsiner, J. (1991). ***Understanding Vygotsky.*** Oxford: Blackwell.

Valsiner, J. (1998). The development of the concept of development: Historical and epistemological perspectives. In W. Damon & R. Lerner (Eds.), **Handbook of child psychology**. 5th edition. Vol. 1. **Theoretical models of human development** (pp. 189–232). New York: Wiley.

Valsiner, J. (2001). Constructive curiosity of the human mind: Participating in Piaget. Introduction to the Transaction Edition of Jean Piaget's ***The child's conception of physical causality*** (pp. ix–xxii). New Brunswick, N.J.: Transaction Publishers.

Valsiner, J. (2002). The concept of attractor: How dynamic systems theory deals with future. Paper presented at the 2nd International Conference on Dialogical Self, Ghent, Belgium, October, 19.

Valsiner, J., & Connolly, K. J. (2003). The nature of development: The continuing dialogue of processes and outcomes. In J. Valsiner & K. J. Connolly (Eds), ***Handbook of developmental psychology*** (pp. ix–xviii). London: Sage.

Valsiner, J., & van der Veer, R. (2000). **The social mind: Construction of the idea.** New York: Cambridge University Press.

Von Baer, K. E. (1828). ***Über Entwicklungsgeschichte der Thiere: Beobachtung und reflexion.*** Königsberg: Borntträger.

Werner, H. (1926). ***Einführung in die Entwicklungspsychologie.*** Leipzig: Johann Ambrosius Barth.

Werner, H. (1927). Ueber physiognomische Wahrnehmungsweisen und ihre experimentelle Prüfung. ***Proceedings and papers of the 8th International Conference of Psychology*** (pp. 443–446). Groningen: P. Noordhoff.

Werner, H. (1937). Process and achievement: a basic problem of education and developmental psychology. ***Harvard Educational Review, 7***, 3, 353–368.

Werner, H. (1940). ***Comparative psychology of mental development.*** New York: Harper & Brothers.

Werner, H. (1948). ***Comparative psychology of mental development.*** 2nd. ed. Chicago: Follett Publishing Co.

Werner, H. (1955). A psychological analysis of expressive language. In H. Werner (Ed.), ***On expressive language*** (pp. 11–18). Worcester, Ma.: Clark University Press.

Werner, H. (1957).The concept of development from a comparative and organismic point of view. In D. B. Harris (Ed.), ***The concept of development*** (pp. 125–147). Minneapolis: University of Minnesota Press.

Werner, H. (1962). Significance of general experimental psychology for the understanding of abnormal behavior and its correction or prevention. In ***The relationship between rehabilitation and psychology*** (pp. 1–19). Washington, D.C.: Office of Vocational Rehabilitation.

Werner, H., & Kaplan, B. (1963). ***Symbol formation***. New York: Wiley.

Werner, H., & Wapner, S. (1949). Sensory-tonic field theory of perception. ***Journal of Personality, 18***, 1, 88–107.

Werner, H., & Wapner, S. (1956). Sensory-tonic field theory of perception: basic concepts and experiments. ***Rivista di Psicologia, 50***, 4, 315–337.

BASIC LIFE COURSE: HEINZ WERNER

1890–	February, 11, born in Vienna—second child—first son to Leopold Werner (manufacturer) and Emilie Klauber Werner. Father dies in 1894.
1908–	Graduated from **Ober-Realschule**, Vienna.
1908–1909	Attending an engineering school **(Technische Hochschule)** in Vienna. Disappointment with the idea of becoming an engineer.
1909–1915	Studies at the **University of Vienna** in History of Music, then moved to Philosophy, Psychology, Biology and Germanic Languages (see chapter 1, this volume). First published articles. 1914 Trebitsch Prize for the study of the blind spot
1914	Defends Doctoral Dissertation ***Psychology of Aesthetic Experience*** (*Zur Psychologie des ästetischen Genusses*, published in 1916)—*summa cum laude.*
1915–1916	works in the Physiological Laboratory (under Sigmund Exner) and at the Phonogram Archive of the Imperial Academy in Vienna (studies of musical abilities of children).
Sept, 1915–Sept, 1917–	Assistant to Oswald Külpe (who died on December, 30, 1915) and then to Karl Bühler (who was recalled from the front to continue Külpe's work—Valsiner, 1998)—at the Psychological Institute, **University of Munich.**

1917–1920	Assistant to William Stern, Psychological Laboratory, **Kolonialinstitut Hamburg** (later University of Hamburg). In 1918 marries Jo Gervai.
1920–1926	*Privatdozent* (Associate Professor), **University of Hamburg** (see chapters 1–3, this volume). *Habilitationsthesis*: ***Grundfragen der Intensitätspsychologie.*** (published in 1922) Publication of ***Die Urspriinge der Lyrik*** (1924).
1926	First German edition of ***Einführung in die Entwicklungspsychologie.***
1926–1933	*Ausserordentlicher* Professor, Psychological Institute, University of Hamburg. Lectures on: General and Experimental Psychology, Genetic Psychology, Psychology of Character, Psychology of Art, Ethnopsychology, Psychology of language. Colleagues at Hamburg: Ernst Cassirer, William Stern, Jakob von Uexküll, Emmanuel Sarris, Marta Muchow, Martin Scheerer. 1932—publication of ***Grundfragen der Sprachphysiognomik.*** 1933–Second German Edition of ***Einführung in die Entwicklungspsychologie.***
1933	Expelled from University of Hamburg by the new Nazi law, stay in Holland, emigration to USA
Sept, 1933–June, 1936	Visiting Lecturer, **University of Michigan**, Ann Arbor Studies on contour and metacontrast, binocular depth perception.
Sept, 1, 1936–Aug, 31, 1937	Lecturer, **Harvard University**, Boston, Ma. Writing of ***Process and achievement*** (published in 1937)
Sept, 1937–Feb, 1944	Research Psychologist, **Wayne County Training School**, Northville, Michigan Lecturer, Summer Sessions, University of Michigan (1939–1943) Lecturer, Wayne University Medical School, 1940 1940—First English edition of ***Comparative Psychology of Mental Development*** 1942—Jo Gervai dies
Feb, 1, 1944–Jan, 31, 1945	Substitute Instructor, **Brooklyn College,** Brooklyn, NY 1945—marries Erica Gervai (younger sister of Jo)
Feb 1, 1945–Dec, 31, 1946	Instructor, bf Brooklyn College
Jan, 1, 1947–Aug, 31, 1948	Assistant Professor, Brooklyn College (1947–48 on leave, at Clark)

1947–1960	Professor of Psychology, **Clark University** 1948–Second English edition of ***Comparative Psychology of Mental Development*** 1949—appointed G. S. Hall Professor of Psychology and Chair of newly re-established Department of Psychology at Clark 1953—Third German edition of ***Einführung in die Entwicklungspsychologie.*** 1957—Third English edition of ***Comparative Psychology of Mental Development***
1959	Fourth German edition of ***Einführung in die Entwicklungspsychologie.***
1960	official retirement
1964	dies in Worcester, Ma.–May, 14.

REFERENCES

Valsiner, J. (1998). The pleasure of thinking: A glimpse into Karl Bühler's life. ***From Past to Future: Clark Papers on the History of Psychology, 1***, 1, 15–35.

Wapner, S., & Kaplan, B. (1964). Heinz Werner: 1890–1964. ***American Journal of Psychology***, 77, 513–517.

Part I

The European Roots Re-examined

When I think of him, I always have a picture of his bemused grin and his twinkling eyes before me. He was a thoroughly humane person, with warm sincerity that was engaging. He was a quiet man who loved his little jokes.

Fritz Heider describing Heinz Werner
at the time of their joint work
in Hamburg, 1927–1929
(F. Heider, ***The life of a psychologist***.
Lawrence, Ks: University of Kansas Press,
1983, p. 83)

1

THE CONTEXT OF THE FORMATION OF HEINZ WERNER'S IDEAS

Ulrich Müller

> A considerable part of our higher human culture is the result of this pervading presence of feelings; it is the basis of imagination, whence spring works of art, and which makes us capable of entering into natural beauty for productive and reproductive power consists in nothing else than the delicacy of apprehension by which the mind is able to clothe the *world of values* in the *world of forms*, or to become instinctively aware of the happiness concealed under the enveloping form (Lotze, 1885, p. 244).

Heinz Werner has been received in the United States as a developmental theorist whose major contribution to psychology consists of the application of the concept of development to different areas of life science (see Glick, 1992; Witkin, 1965). While several summaries of the core themes of Werner's developmental theory are available (e.g., Glick, 1992; Langer, 1969; Langer & Sugarman, 1978; Witkin, 1965), little is known about the intellectual-cultural and academic context in which Werner conceived of his basic ideas. It is frequently claimed that Werner was exposed to and influenced by "a ferment of philosophic and scientific ideas deriving from Kant, Hegel, the empiricist-positivist tradition, and evolutionary history" (Kaplan & Wapner, 1960, p. 14; cf. Glick, 1992). However, no detailed analysis is available of who in particular influenced the development Werner's ideas or how this influence is reflected in his work. There was certainly a strong neo-Kantian and idealist heritage in *fin-de-siècle* Vienna, the city in which Werner grew up and received his entire education. Kant's critiques of knowledge, morals, and aesthetics, and the Kantian concepts of representation and schemata were widely discussed (Janik & Toulmin, 1973). Although Werner addresses Kantian themes in his first publication (1912a), he does so in a critical manner. Other references to Kant, neo-Kantian

philosophers, and Hegel are virtually nonexistent in Werner's work. Furthermore, the philosopher Ernst Cassirer had a tremendous influence on Werner (Glick, 1992), but Cassirer is not cited in Werner's writings until 1926, when Werner had already published two books and several articles.

The first goal of this chapter is to identify key influences on the formation of his thought on the basis of his early writings. Unfortunately, unlike Piaget (1976), Werner never wrote an intellectual autobiography. Furthermore, in his early writings, he does not place his ideas within the context of any particular philosophical or psychological tradition, which makes it somewhat difficult to reconstruct the sources of his inspiration. Nevertheless, analysis of the cultural context in which he was raised and educated and an examination of his early writings point to three lines of influence on the formation of his thought. The first line is the cultural-intellectual climate of Vienna that provides the background for his interest in aesthetic-expressive phenomena. The second line of influence is constituted by Ernst Mach and the Viennese philosopher Adolf Stöhr, both of whom inspired Werner's early work on perceptual phenomena and conceptual development. The third line is represented by the psychologist Felix Krueger (1915) whose programmatic treatise on development deepened and transformed Werner's thinking about genetic issues. Each line of influence will be presented in a separate section.

The second goal of this chapter is to examine the inner developmental dynamics of the Werner's thought. Special emphasis will be placed on the evolution of the concept of development and the emergence of the concept of physiognomic perception, which emerged in Werner's writings in the 1920s and plays a central role in integrating his interests in aesthetic-expressive, linguistic, and perceptual phenomena. Finally, continuities between his early writings and his later work on development (Werner, 1957), perception (Wapner & Werner, 1952), and symbol formation (Werner & Kaplan, 1963) will be discussed at the end of each section.

GROWING UP IN HABSBURGIAN VIENNA

Throughout his career, Werner showed a keen interest in aesthetic phenomena. As a child, Werner was already drawn to the arts (Kaplan & Wapner, 1960; Witkin, 1965). Among his first publications (Werner, 1913a) is an article on artistic-creative processes, and his dissertation (1914) dealt with the psychology of aesthetic enjoyment. In the preface to the book on the origins of lyric (Werner, 1924a), he states that he intended this book to be the first volume of a series on the developmental psychology of art. What is the source for Werner's preoccupation with aesthetic phenomena? Aesthetic phenomena were salient in psychological discussions at the beginning of the last century (Valsiner & van der Veer, 2000; von Allesch, 1987), which may have stimulated his preoccupation with aesthetic phenomena from a psychological perspective. However, it is likely that Werner's interest in aesthetics has its origin in the cultural-intellectual climate of his hometown, Vienna.

Heinz Werner was born in Vienna in 1890 to Leopold Werner, a manufacturer, and Emilie Klauber Werner (Witkin, 1965). He grew up and received his entire education in the Vienna of the Habsburg period. By 1900, Vienna had been the capital of the Habsburg empire for centuries. A multinational and multilingual state, the Habsburg empire was riddled by political paradoxes, as succinctly captured by the psychologist-turned writer Robert Musil:

> By its constitution, it was liberal, but its system of government was clerical. The system of government was clerical, but the general attitude to life was liberal. Before the law, all citizens were equal; not everyone, of course was a citizen. There was a Parliament which made such vigorous use of its liberty that it was usually kept shut; but there was also an Emergency Powers Act, by means of which it was possible to manage without Parliament. And each time that everyone was just beginning to rejoice in absolutism, the Crown decreed that there must now again be a return to parliamentary democracy. (Musil, 1979, p. 33)

The third half of the 19th century (the so-called Gründerzeit) was a period of industrial expansion during which Viennese entrepreneurs acquired vast fortunes. In an attempt to imitate the life-style of aristocracy, these entrepreneurs used their money to ornament their houses with pieces of art, and patronage of the arts became a barometer for a person's social and economic status:

> A man proved that he was someone by devoting his free time to the arts as wholeheartedly as he did his working time to his business. Viennese of the generation that reached maturity at the turn of the century were raised, indeed, in an atmosphere so saturated with, and devoted to, 'aesthetic' values that they were scarcely able to comprehend that any other values existed at all (Janik & Toulmin, 1973, p. 44).

The generation of the Gründer cherished reason, order and progress, perseverance, self-reliance and disciplined conformity to the standards of good taste and action, and condemned the irrational, the passionate, and the chaotic (Janik & Toulmin, 1973). The sons of the generation of the Gründer revolted against this paternal value-system (Schorske, 1961). "If the generation of the Gründer held that 'Business is Business' and art is essentially the ornamentation of business life, their sons retorted that 'Art is Art' and business is a tedious distraction diverting one from (artistic) creation" (Janik & Toulmin, 1973, p. 45). Because the new middle class never, for a variety of reasons, gained political power, aestheticism became the only alternative to the immersion in business affairs for the sons of the Gründer—"So art, which had earlier been the decoration adorning middle-class success in business, became for the younger generation an avenue of escape" (Janik & Toulmin, 1973, p. 48).

The sons of the Gründer generation found refuge in the coffeehouses where a tightly knit community of artists exchanged ideas and values (Janik & Toulmin, 1973; Schorske, 1961). At the turn of the century, Vienna experienced a very fertile, original, and innovative period in art (e.g., the secession led by Gustav Klimt),

architecture (e.g., Adolf Loos), music (e.g., Arnold Schönberg's 12-tone system of musical composition), literature (e.g., Hugo von Hofmannsthal, Robert Musil, Arthur Schnitzler, Stefan Zweig), psychology (e.g., Sigmund Freud) and philosophy (e.g., Ernst Mach's positivism) (see Janik & Toulmin, 1973; Johnston, 1972; Schorske, 1961). Common to the innovations in art, architecture, and music was the search for a more authentic way of self-expression that would break with the hypocrisy of the Gründer society and remedy the identity problem experienced by the younger generation.

Key to the solution of the identity problem was a fundamental critique of the accepted means of expression. Karl Kraus—Werner (1932, p. 130) was familiar with Kraus's work—and Fritz Mauthner called for a critique of language, and soon their critique reverberated in other fields of intellectual and artistic activity. The questions raised in the context of these critiques sound quite modern:

> How could any 'medium' be adequate to any 'message'? How could anything whatever serve as a means of expressing or symbolizing anything else? All over the artistic and intellectual field, we find men taking up this same critique. In what sense if any could music (for example), or painting, or architecture, or everyday language, be regarded as a 'representation? . . . [T]he idea of regarding language, symbolisms and media of expression of all kinds as giving us 'representations' (Darstellungen) or 'pictures' (Bilder) had by 1910 become a commonplace in all fields of Viennese cultural debate. (Janik & Toulmin, 1973, p. 31)

The cultural-intellectual debate in fin-de-siècle Vienna, thus, revolved around aesthetic issues, language, and symbolic representation, and these issues were to become core themes in Werner's thinking.

WERNER'S EARLY MENTORS IN VIENNA (1912–1915)

Similar to many sons of Viennese entrepeneurs and engineers (e.g., Musil and Wittgenstein), Werner entered university with the intention of becoming an engineer and, similarly to Musil and Wittgenstein, he was attracted to psychology and philosophy. From 1909 to 1914, Werner studied the arts, philosophy, and psychology at the University of Vienna, and from 1914 to 1915, he worked as an assistant in the physiology laboratory of Exner (Witkin, 1965). Also during his period in Vienna, he published a number of articles that tackled such diverse issues as the genesis of concepts (1912a, 1912b), the problems of logical substitution (1915), aesthetic-expressive topics (1913a), basic perceptual (1913b, 1913c) and psychophysiological phenomena (1914). His interest in and approach to concepts, logic, and perceptual phenomena was influenced by Ernst Mach and the Adolf Stöhr, and this section discusses those ideas of Mach and Stöhr that are reflected in Werner's early writings.

Ernst Mach

Although Ernst Mach (1838–1916) taught at the University of Vienna for only a short period (1895–1901), he had a great impact on all sciences, the arts, and aesthetic views in fin-de-siècle Vienna (Berlage, 1992; Stadler, 1988). Mach's writings present a unique synthesis of idealistic, empiricist, monistic, mechanistic, evolutionary, and genetic ideas (Berlage, 1992; Sommer, 1987, 1988). His rejection of any type of metaphysics (1902/1987, 1906) and his dismissal of all statements not empirically testable paved the ground for the rise of positivism (Berlage, 1992). He endeavored to give a solid foundation to the natural sciences by deriving human knowledge from ultimate elements. According to Mach, sensations are the ultimate elements into which all knowledge can be analyzed (1902/1987, 1906). He also suggested that sensations in themselves are psychophysically neutral, i.e., neither psychic nor physical (1906, p. 24), and that they can be studied from both a psychological and physical perspective. He believed that sensations can take on a psychic or a physical character, depending on the perspective from which they are studied (1902/1987). Because sensations occur only in complexes, the task of the empirical sciences, in Mach's view, is to study the manifold of and the functional relations between sensations (1906).

Mach was a proponent of a biological-evolutionary approach to cognition, and he believed that all knowing is directed toward the adaptation of the organism to its environment. As a consequence, he rejected the Kantian concept of a synthetic *a priori*, which he mistakenly understood as innate knowledge. Instead, he argued that all knowledge is derived from experience, and that innate dispositions are the result of experiences made in the course of phylogenesis. Innate dispositions form the basis for learning in the course of ontogenesis, and learning occurs by association: an earlier experience is reproduced (e.g., taste of an apple) when it is associated with the element of the current experience (e.g., sight of an apple). Association thus explains why, for example, the taste of an apple is experienced when the apple is only seen (Mach, 1906, pp. 33, 36, 59, 110). Mach also endorsed the biological-evolutionary principle of economy, which was very popular in the first decades of the last century (e.g., Vygotsky, 1925/1971). The principle of economy states that all our thinking and cognition is governed by the goal of parsimonious use of energy and time. The formation of concepts, for example, is economical because, in contrast to perception, which can refer to only a single object at a time, concepts afford the opportunity for denoting an infinite number of objects by means of only one symbol (Mach, 1906, pp. 135–136).

A further characteristic of Mach's work is his approach to scientific problems from a historical-developmental perspective (e.g., Mach, 1904/1960). The developmental perspective reveals that scientific research emerges in the context of solving practical, everyday problem, and emancipates itself only gradually from practical purposes to become an autonomous, self-organizing enterprise (Mach, 1906, pp. 2–3). Mach also believes that children's questions and remarks are highly

relevant from an epistemological perspective (Blackmore, 1978, p. 417). Consequently, in backing up arguments, he makes frequent use of his own childhood memories and the observations of his and other children (Blackmore, 1978; Mach, 1987, p. 262). In addition, occasionally Mach engages in discussions of primitive thought to elucidate the development of cognition (e.g., Blackmore, 1978, p. 411; Mach, 1906, pp. 71–117).

Adolf Stöhr

Adolf Stöhr (1855–1921) studied law, philosophy, and plant physiology before turning to philosophy. From 1885 until his death in 1921, he worked at the University of Vienna, where in 1901 he was appointed extraordinary professor of philosophy and in 1911 became the successor to Boltzmann as the professor of philosophy of the inductive sciences (Austeda, 1974). Stöhr had become acquainted with the experimental approach to psychology while working with Wilhelm Wundt in Leipzig. Although his efforts, undertaken with Friedrich Jodl, to establish a laboratory for experimental psychology at the University of Vienna were unsuccessful (Benetka, 1995), he managed to establish an experimental-psychological laboratory at the school for adult education (***Volkshochschule***). Many of Stöhr's lectures and books dealt with experimental psychology, the psychology of perception and sensation, the psychology of association, the psychology of language, the psychology of temporal experience, and social psychology (Austeda, 1974, pp. 11–13). It is likely that Werner attended some of Stöhr's lectures.

Stöhr admired the work of Mach and, like Mach, was a proponent of an experimental approach to epistemological questions. Stöhr's epistemological work centers on problems of perception, specifically, depth perception and stereopsis (1904), and on the critique of knowledge (1910), which, for Stöhr, consists of the critique of language. The critical analysis of language shows that many epistemological problems arise from a literal understanding of metaphors. Metaphorical use of language arises out of need for expression (***Ausdrucksnot***—Stöhr, 1910, pp. 81–84): In situations where the speaker lacks a word, the concept to be expressed reminds the speaker of some other concept. The speaker then borrows the name from this similar concept. The use of metaphors is functional because it relieves memory and allows one to express a large number of concepts with a limited stock of nouns and verbs. However, all kinds of epistemological pseudo-problems are created when metaphors are conventionalized and taken literally (***Metaphernblindheit***; see Stöhr, 1910, p. 84).

Particularly influential on Werner's early publications on concept development was Stöhr's book on logic (1910). In this book, Stöhr presents a psychologistic approach to logic and concepts, the goal of which is to make conscious formerly unconscious elements of thought. According to Stöhr, a large portion of our thinking and communication has been automatized and is unconscious. While during the acquisition of, say, the derivation of mathematical formulae, conscious thought is

required. Once the formulae have been acquired, the mathematical derivation runs off without consciousness, and conscious computation is replaced by mechanical computation. The initially conscious grasp of the formulae is not lost, but has sunk into the unconscious from where it can be reactivated. Automatization is functional because it creates working space for the acquisition and invention of new operations.

Whereas the type of automatization that occurs in the process of mastering a task is based on an original understanding of the task, this is not the case for language acquisition. In language acquisition, children unreflectively take over the mechanization of the thought operations that have sedimented and accumulated in the syntax and morphology of the language over time. Thus, as children, we all acquire a system of mechanized thought operations that we are unable to understand. If the mechanized thought operations that have sedimented in the structure of language are to be replaced by conscious thought, we need to perform a mental task that we have not performed before. Accordingly, Stöhr defines the task of logic as follows:

> "[I]t is the task of logic to replace the whole mechanisms of speech movements which we inherited from our ancestors and which functions as if it were a system of thought operations by a system of real thought operations ... [Logic] is neither a science in the ordinary sense nor an art but the development of an ability. Logic wants to develop, alongside the mechanism of speech movements, a system of thought operations" (Stöhr, 1910, pp. xi–xii).

If the system of thought operations is not developed, then thought is dominated by language. Thus, logic is "the history of the struggle of developing thought against the reigning figures of speech" (p. 409, my translation).

In the course of his logic, Stöhr analyzes and reconstructs, among others, the thought operations that underlie concepts, names, sentence structures, and logical relations between sentence meanings. At several places of his book, Stöhr engages in genetic considerations, particularly when he interprets children's use of language (e.g., 1910, pp. 67–68, 109–110). In this context, Stöhr frequently uses the term ***Kindersprache*** (children's language), which is the title of the groundbreaking book by Clara and William Stern (1907). Stöhr, however, never refers to this book or to the Sterns, so it is unclear whether he was familiar with the book.

A genetic perspective also guides Stöhr's reconstruction of concepts. Concepts originate in actions that reproduce certain representations: "Concepts ... are reproductive activities" (Stöhr, 1910, p. 7, my translation). For example, when we use a pair of compasses to draw a circle, the physiological movement and the movement sensations along with the visual impression of the circle reproduce successive representations of circles of different color and size. By using the pair of compasses, we construct the concept or, to use Stöhr's expression, the tool and our use of it function as a ***Begriffsbildner*** (constructor of a concept). The tool serves as the persistent reproducer of various representations (e.g., circles), while the representations are variable.

Like Mach, Stöhr suggests that most primitive concepts have their origin in practical activities that are related to our biological drives. Initially, these concepts are not well differentiated, because the child reacts with undifferentiated movements to any stimulation. With the differentiation of movements, concepts become more differentiated. Eventually, movements are not executed any longer but are replaced by movement preparedness (Stöhr, 1910, pp. 2–7).

Stöhr distinguishes four stages in the development of self-generated concepts (1910, pp. 78–79). At the pre-linguistic stage, a concept A is a sequence of representations A reproduced by a persisting B (B is the ***Begriffsbildner***). At the second stage, the reproduction of A is accompanied by motor speech movements (i.e., the verbal expression of the name of the instances of A). The motor movements are associated with the ***Begriffsbildner*** B and not with instances of A. Physiologically, the area of the brain where the ***Begriffsbildner*** is represented sends a multitude of activations that reproduce the representation of the instances of A and the motor speech movement. At the third stage, the stage of the semi-verbalized concept, the concept A consists of a representation and is accompanied by its name, and this representation elicits other instances of A through the process of association. At the fourth stage, the concept A consists of the name for A. Thus, in the process of conceptual development, the ***Begriffsbildner*** and the representation of exemplars slowly fade away, because motor components drain off their activation. As a result, the concept is defined by its name; the name has annexed the constructive activity of the ***Begiffsbildner*** (Stöhr, 1910, pp. 58, 69, 76).

The sequence of conceptual development is reversed when concepts are not self-produced but taken over from other people, in language acquisition, for example. In language acquisition, the child is confronted with a new word and has to learn the appropriate concept. A new word is understood when a name is associated with the representation of the referent. Because children's attention may be drawn to a different (aspects of the) referent, they may initially use the word in a manner different from adults and overextend its reference (1910, pp. 79–80; see also Mach, 1902/1987, p. 262).

WERNER'S EARLY WRITINGS: CONCEPTS, LOGIC, AND PERCEPTION

Werner's first publications on concepts (1912a/1978, 1912b, 1914, 1915) address problems that result from the work of Mach and Stöhr, and his approach to these problems is heavily influenced by them, as is manifest not only in frequent references to these authors, but also in many substantive similarities. Werner (a) considers concepts as economic tools that originate in our approach to practical problems (Mach, Stöhr); (b) uses anecdotal observations of children in the presentation of his arguments (Mach, Stöhr); (c) derives concepts from sensations (Mach); (d) adopts a genetic-reconstructive approach to concepts (Stöhr); and (e) claims that dynamic concepts are reproductive activities (Stöhr). However, Werner also

goes beyond Mach and Stöhr by providing a special place for aesthetic concepts in his typology of concepts.

In his first publication (1912a/1978), Werner sets up a classification of concepts from a genetic basis. Werner distinguishes between two basic psychological functions that give rise to different concepts: (1) feeling; (2a) inner or dynamic (i.e., movement sensations), and (2b) outer or static (vision, hearing, smell, taste) sensation. Feelings provide the material for feeling-concepts and sensations provide the material for sensation-concepts. Feeling concepts arise from the evaluation of sensation complexes and the projection of feelings into objects (see Mach, 1906, p. 22). For example, a child may call a table "bad" after having hurt herself against it. The property "bad" can be apperceived as any other sensory property and can become the carrier of an intuitive concept. Feeling concepts give rise to either moral or aesthetic feeling concepts, depending on whether feelings evaluate dynamic or static sensations.

Werner (1912a/1978) subdivides dynamic concepts into practical concepts and aesthetic concepts. Practical concepts involve actions on or reactions to things (e.g., throwing a ball). Following Stöhr (1910), Werner states that at the beginning, such practical concepts may be imprecise because the activities involve irrelevant movements, but through practice, irrelevant movements are removed, and through abstracting activities, an efficient action "is formed that is always induced by that specific object" (Werner, 1978, p. 10). Werner (1914, pp. 437–439) provides a neurophysiological model for the fading out of irrelevant movements: Whereas adaptive movements are reinforced, leading to a strenghtening of neural pathways, irrelevant movements are not reinforced, leading to an atrophy of neural pathways. Eventually, movements recede and all that remains is a state of subjective preparedness.

The aesthetic concept arises from imitation (Werner, 1912a/1978). For example, the child may learn the concept "locomotive" by imitating the movements and noises of a locomotive. The child apperceives salient or characteristic features of the object and internalizes them by imitative actions. In the case of practical concept, the activity is already subjective, whereas, in the case of the aesthetic concept, the activity of the object is subjectivized by our becoming the carrier of its activities.

Werner distinguishes different levels in the genesis of the static concept. Initially, the static concept is purely intuitive, because it is represented by only one sensation. This type of static concept is formed when a sensation A is repeated in different sensory complexes. As a result, A moves into the foreground and the other features of the complex recede into the background, so the single sensation A becomes an independent entity (see also Mach, 1906, p. 36; 1902/1987, p. 268). For example, for children, the single sensation "white" may be characteristic of diverse complexes such as flour, snow, and sugar. At the next level of the development of the static concept, a whole sensory complex is apperceived. The concept becomes a sum of sensations, which in each instantiation of the concept coexist in different functional relations (see Mach, 1906, 1902/1987). Following Wundt, Werner uses the term "apperceived concept" to refer to this type of concept, because it is

the process of apperception that constructs a typical representation by selecting a prominent feature that visualizes the concept. Finally, the highest level of the static concept is the scientific or abstract concept. The scientific concept is based on (a) the analysis of each member of a series into qualitative features and (b) the abstraction and re-combination of those features that exhaustively determine the concept (Werner, 1912a/1978, 1912b).

Practical and apperceived concepts are thus constructed in a manner that differs from the construction of scientific concepts (Werner, 1912b; see Mach, 1906, pp. 23, 304–319). While the formation of practical concepts proceeds synthetic-inductively, quantitatively, and mostly unconsciously, scientific concepts are obtained by deductive analysis. Using the logical notation employed by Stöhr (1910), Werner (1912b) shows that each type of concept formation corresponds to a different type of logical substitution.

Because concepts result from reproductive activity, they cannot be derived from associations (Werner, 1915; see Stöhr, 1910). Rather, concepts are the genetic condition of associations. Repetition of a sensory complex generates associations that gradually replace the initially dominant representation. For example, the representation "locomotive" may initially be the dominant representation; in the course of reactivating the representation of the locomotive, other representations (e.g., whistle, steam, or wheels) that accompany the representation of locomotive may replace the latter.

The learning of new associations is based on the neurophysiological principle that two simultaneous stimulations produce a connection between those brain areas that are stimulated (Werner, 1914). More frequent simultaneous stimulation results in stronger connections. Once the neural connection between stimulations has been forged, both stimulations can represent each other. For example, the frequent coupling of visual and gustatory stimulation leads to a strengthening of the neural connection between visual (S_1) and gustatory cells (S_2), such that later gustatory sensations are experienced when given only visual stimulation (see Mach, 1906, pp. 32, 42, 36, 59, 110).

From a developmental perspective, dynamic concepts precede static concepts (Werner, 1912a/1978). Moreover, young children and people from primitive cultures lack general concepts (Werner, 1915). Their conceptual world consists of unanalyzed complexes that are charged with feelings and dynamic sensations. The fact that young children react to similar situations with identical vocalizations and movements often creates the impression that young children use general concepts. Such a view, however, is mistaken, because young children do not yet consciously understand the concept of identity; they just react in an identical fashion to similar stimulus configurations. The concept of identity emerges when children realize that different stimulus configurations had been treated in an identical way (Werner, 1915). Unanalyzed complexes are also frequently encountered in the mental life of adults, which is why "a large part of the representational world of the adult remains on the developmental level of the experiential world of the child" (Werner, 1915, p. 172, my translation). A further characteristic of concepts in early childhood is that

they are subjective and idiosyncratic (Werner, 1915). Concepts become socialized and intersubjective in the process of language acquisition. Werner (1915) points out that idiosyncratic concepts dominate in dreams, psychopathic states, and artistic intuition.

During his period in Vienna and possibly inspired by Stöhr, Werner also engaged in work on perceptual problems and published one article on the blind spot (1913b) and one on geometrical-optical fusion (1913c). The article on the blind spot questions whether the gap in the visual field that is created by the blind spot is filled out by representations, or whether it is a psychological nothing (1913b). The former view was held by Wundt, the latter, by Mach and Stöhr. Using several geometrical figures as illustrations, Werner defends the thesis that the blind spot is a "psychological nothing" within the sphere of visible continuity, and he also demonstrates that the blind spot can produce deformations and reductions within the visual field.

Finally, the relation between perception and action is central in an article (Werner, 1914) that develops a theory of practice from a physiological perspective. Here, Werner endorses Bell's law that there can be no discharge of motor activity unless there is simultaneous inflow of sensory stimulation. Thus, by 1914, Werner had already stipulated the dynamic relation between sensory and motor functions that became an essential characteristic of sensory-tonic field theory (see Werner & Wapner, 1952).

Continuity with Werner's Later Work

Several themes and ideas present in Werner's early writings re-appear and are elaborated on in his later writings. The different levels of conceptual development (dynamic, static-apperceived, scientific) loosely correspond to the three levels of processes (sensorimotor, perceptual-intuitive, conceptual-abstract) that are distinguished in his later writings (Werner, 1926/1948). The idea that irrelevant movements are removed from undifferentiated global movements through abstracting activities is in later writings transformed into the idea that partial patterns differentiate from a global whole and are integrated with a newly developing activity (Werner, 1957; Werner & Kaplan, 1963, p. 80). The concepts of movement preparedness and imitation come to play important roles in the development of the symbolic function (Werner & Kaplan, 1963, pp. 84–98). The correspondence between Werner's belief that sensory and motor functions are dynamically related to each other and are an essential characteristic of sensory-tonic field theory has already been pointed out. The principle that lower levels of functioning are retained in the course of development and resurface in special conditions can also be found in Werner's later work (Werner, 1924/1948, Werner & Kaplan, 1963, p. 8), and inklings of a comparative approach to development can be recognized his early writings (particularly Werner, 1915).

Interestingly, Werner's early work on concepts shows some striking similarities to Vygotsky's (1986) theory of concept formation. For example, the second phase

in Vygotsky's theory (phase of "thinking in complexes, Vygotsky, 1986, p. 112) resembles Werner's notion of static-apperceived concepts. Furthermore, similar to Werner, Vygotsky (1986, pp. 146–209) suggests that different processes are involved in the formation of practical ("spontaneous") and scientific concepts. Finally, like Werner Vygotsky (1986, p. 164) proposes that the consciousness of difference precedes the concept of similarity.

However, in contrast to Vygotsky (1934), Bühler (1919), and Piaget (1951), Werner does not assign any important function to judgments in concept formation. With the exception of the process of reflection (Werner 1912a, p. 61; see Stöhr, 1910, pp. 137–141), which produces concepts that are not based on sensations, higher mental functions are absent in Werner's writings. This may be due to the influence of Mach (1906, 1902/1987), who dismissed the concept of psychological acts. Accordingly, it appears at times that Werner (1912a, p. 45) reduces the understanding to an ordering device for sensations, essentially blurring the distinction between sensation, representation, and concept. However, by adopting Wundt's notion of apperception and Stöhr's idea that concepts are reproductive activities, Werner (1915) deviates from Mach and creates space for the activity of the person.

RE-SHAPING THE CONCEPT OF DEVELOPMENT: BEGINNING FROM METAPHOR AND LYRICS

From 1919 on, Werner's thought on development ventures out in new directions. In his books on the origins of metaphor and the origins of lyric, he adopts a new perspective. Although he uses the term "genetic" in his articles on concepts to describe the logical reconstruction and classification of different types of concepts, he approaches aesthetic-expressive phenomena in his books on metaphor and lyric from an ethnological-comparative method. This change of focus and method is due to Werner's reception of Felix Krueger's book on development (1915). Indeed, Werner's book on metaphor (1919) was published in a book series edited by Krueger, and from 1919 onward Werner frequently refers to Krueger when discussing the concept of development.

Felix Krueger's Concept of Development

Felix Krueger (1874–1948), who was the last assistant to Wilhelm Wundt, was the founder of the Leipzig school of holistic psychology (***Ganzheitspsychologie***; see Herrmann, 1978; Krueger, 1924; Valsiner & van der Veer, 2000, pp. 289–296). In contemporary psychology, Krueger and the Leipzig school of holistic psychology have been almost completely forgotten, partly because many its members collaborated with the Nazi system (for discussions of the relations Krueger and other members of the Leipzig school to national-socialist ideology see Geuter, 1985, Prinz, 1985, and Scheerer, 1985).

Krueger's book on developmental psychology (1915) must be interpreted within the context of the struggle of psychologists to maintain their academic position vis-a-vis the criticism of philosophers that was directed against the scientific value and of psychology as a science independent of philosophy (Ash, 1985). Krueger acknowledges that the criticism of philosophers is justified when it is directed against the mechanistic, atomistic, agenetic, and individualistic conceptions of psychology as promoted by Herbart and empiricist philosophers. However, Krueger argues that an alternative conception of psychology that is based on organic, holistic, developmental, and social conceptions is indispensable to the growth of knowledge in philosophy and the emerging new cultural sciences, particularly ***Völkerpsychologie.***

Krueger draws heavily on the concept of development to justify the existence of psychology as an independent science. In 1862, Wundt argued that in order to become a science with a solid foundation, general psychology needed the support from developmental psychology and comparative psychology (comparative psychology includes evolutionary psychology as well as ***Völkerpsychologie***, see Wundt, 1862, p. xiv). The term "development" moves into focus in Wundt's ***Völkerpsychologie***, as already evident in the title of Wundt's (1912/1916) book *Elements of Folk Psychology: Outlines of a Psychological History of the Development of Mankind.* In the introduction to this book, Wundt emphasizes the social and genetic nature of psychological phenomena:

> All phenomena with which the mental sciences deal are, indeed, creations of the social community.... [I]n the analysis of the higher mental processes, folk psychology is an indispensable supplement to the psychology of individual consciousness... Individual consciousness is wholly incapable of giving us a history of the development of human thought, for it is conditioned by an earlier history concerning which it cannot of itself give us any knowledge. For this reason we must also reject the notion that child psychology can solve these ultimate problems of psychogenesis. Among cultural peoples, the child is surrounded by influences inseparable from the processes that arise spontaneously within its own consciousness. Folk psychology, however, in its investigation of the various stages of mental development still exhibited by mankind, leads us along the path of true genesis. It reveals well-defined primitive conditions, with transitions leading through an almost continuous series of intermediate steps to the more developed and higher civilizations. Thus, folk psychology is, in an important sense of the word, *genetic psychology* (Wundt, 1916, pp. 2–4, emphasis in the original).

Following Wundt, Krueger (1915, pp. 177–180) argued that cultural phenomena should be approached from the perspective of developmental psychology, because psychological necessities constitute the core of culture and are the formative forces of cultural development. The major task of psychological investigation is the elaboration of developmental sequences by inferring back from developed end states to their conditions and the continuous process of becoming.

In contrast to historical sciences, which aim at the reconstruction of past events in their uniqueness and singularity, the goal of psychological investigations is to establish universal laws of development (Krueger, 1915, pp. 185–187). At the same time, psychological investigations must not lose sight of the social context of psychological phenomena. No psychic experience is independent of its social context; even perceptual and peripheral phenomena must be studied from a social-genetic perspective (Krueger, 1915, p. 68). "For psychology, the difference between the individual and the social is external and provisional" (Krueger, 1915, p. 216, my translation).

Krueger (1915, 167–168) elaborates three features that characterize the scientific concept of development:

1. Developmental changes are continuous.
2. Developmental changes occur in a whole that consists of qualitatively different, interacting parts. The whole conserves itself in all its changes as a system. The whole is more than the sum of its parts because it constitutes a synthetic, living structure, which is why the whole cannot be understood without considering the past and present interactions of its parts. Holism applies not only to the individual organism but also to a larger, cultural unit, which has its own reality and is constituted by different and interrelated cultural spheres (e.g., economy, custom, law, art, religion; Krueger, 1915, p. 202).
3. The changes of the whole have a direction and the direction is conceptually determined by structural laws, the discovery of which is the task of developmental theory.

Krueger (1915, pp. 99–103) suggested that developmental investigations should combine different directions of questioning and different methods (self-observation, comparative methods, historical, and ethnological methods) and not rely solely on the experimental approach. He particularly highlights the importance of genetic-comparative methods for the study of cultural phenomena. The genetic-comparative method proceeds from the analysis of the components of psychic phenomena to the analysis of their conditions. By systematically analyzing the conditions of psychic phenomena in different contexts, and by comparing the phenomena across these contexts, one arrives through successive abstraction at universal developmental laws.

Krueger (1915, p. 231) closes the book with the remarks that the most pressing and promising tasks for contemporary psychology are to clarify questions concerning the theory of development and to expand its methods in collaboration with the life sciences. These remarks must have resonated with Werner, because he took to heart Krueger's (1915, p. 231) advice that these tasks can only be accomplished through the publication of diligent monographs on particular problems of individual and cultural development.

Werner's Books on the Origins of Metaphor and the Origins of Lyric

Chronologically, Werner's books on the origin of metaphor (1919) and the origin of lyric (1924a) were written at the same time. In the preface to the book on metaphor, Werner tells us that the book is an expanded section of a larger work on the origins of lyric, which could not be published due to circumstances, and in the preface to the book on lyric, he states that the main parts had been finished for six years.

Thematically, both books deal with ethnological data from a developmental-psychological perspective, using a comparative method. The books are not historical investigations but, rather, "intend to explain the objective forms found in works of art from a psychological perspective, i.e., to trace them back to the creative spirit which manifests ("versinnlichen") itself in these forms and their contents, and to understand the developmental stages of art as stages of general cognitive development" (Werner, 1924, preface; my translation). In contrast to a developmental-psychological approach, a biological-evoluationary approach to aesthetic phenomena is insufficient, because, as in all purely functional explanations, it can only show why a particular form, once it has emerged, is preserved. It does not explain how it originated.

The developmental-psychological analysis of art necessarily leads to a sphere of mind that differs in principle, not just quantitatively, from the mind-set of people in highly developed cultures (Werner, 1924, p. 1). To describe the mind-set of people in primitive cultures, Werner draws on his earlier work on conceptual development (1912a, 1915), rhythm (1918), and the invention of melodies in young children (1917).[1] For example, he describes conceptual thought of primitive cultures and the magical attitude in terms of unanalyzed complexes, and he uses the three developmental levels of conceptual development (practical-sensorimotor, static-intuitive, and abstract-scientific) to characterize different levels of cultural development.

Origins of Metaphor

Werner's book on metaphor is largely unknown, despite the praise the book received from Roman Jacobson (1955, p. 72) and Karl Bühler (1990, pp. 400–401). The book picks up the topic of metaphor that was salient to Stöhr and received considerable attention in Viennese intellectual circles. At the beginning of the book, he distinguishes between "origin" as the emergence of something new and "development" as the gradual unfolding of forms. Origin and development are two aspects of the same process. Shift of motive is the major developmental process that mediates between origin and development and leads to emergence of novelty. In the history of humankind, shift of motive adapts existing forms to new circumstances. Customs and artifacts of a more primitive period are taken over at higher levels

[1] This book was not available to me and cannot be discussed in the present chapter.

as ready-made materials that serve new purposes. For example, in the pre-magical period, hunters imitated animals for the practical purpose of approaching their prey. In agricultural societies, imitation of animals in ceremonies served the magical purpose of ensuring a successful hunt. Shift of motive is also a major force in the evolution of metaphor.

Werner (1919, p. 3) distinguishes between a formal, logical and a psychological definition of metaphors and similes. Formally, metaphors and similes equate one expression with another expression that is not taken in the literal sense. Metaphors and similes are fundamentally the same. The only difference is that similes express both the literal referent of a word and the referent to which it is metaphorically applied, metaphors leave out the literal referent (Werner, 1924, p. 43).

The formal definition of metaphor ignores the subjective mental attitude that underlies the production of the simile. By contrast, the hallmark of the psychological definition is that the person producing the metaphor has an awareness of the fictitious nature of the equation. The person must understand the duality of the representational expressions and not consider them identical, and the person must consider this duality not as a sameness but as a casual (***beiläufige***) equation (Werner, 1919, p. 4). Because the logical definition ignores the cognitive basis that underlies the production of the equation, it cannot distinguish between true metaphors and equations that superficially look like metaphors but were not produced with the intention of using a metaphor. Therefore, only the psychological definition can constitute the basis of an investigation into the origin and development of metaphor.

A major goal of Werner's was to unravel the cultural conditions that are a prerequisite for the emergence of the mental attitude that constitutes the basis for the use of metaphor. For that purpose, he analyzed in great detail what the use of metaphorical expression means. Werner claimed that metaphors are not used to logically clarify things—a function much easier accomplished by using concepts—but rather to conceal their topic. Yet, in contrast to lies, metaphors do not distract attention from the true state of affairs, because metaphorical expressions display some kind of similarity with their topics. Thus, metaphors are ambivalent in that they conceal and reveal the truth at the same time.

More primitive stages of the mind (motor stage, emotional stage, anthropomorphistic stage) pave the ground and supply the material for true metaphors. Although some behaviors that occur during these stages sometimes appear to be indicative of true metaphors, a closer analysis reveals that these behaviors lack the consciousness of the fictitious character essential for true metaphors. Werner (1924, p. 43) terms these metaphor-like productions pseudo-metaphors. For example, when an animal transfers a specific behavior from one stimulus to another stimulus, nothing suggests that the animal is aware of this transference, and it is more parsimonious to assume that the animal is simply showing the identical reaction to different stimuli.

Werner holds that true metaphors originate from the taboo, because the consciousness of fictitiousness results from the world view structured by taboo. Taboo is the prohibition of touching things that carry ***pneuma***. According to the primitive

world view, every entity has an intangible *pneuma* that penetrates it; this *pneuma* can radiate to the environment without losing its power, and *pneuma* can be transferred through contact. Werner suggests that the belief in *pneuma* originates in the fear and avoidance of dangerous objects, persons, or events. Originally, the taboo served the vital function of protecting against objects with evil *pneuma.*

The taboo leads to a differentiation between inner feelings and desires and outer behavior, particularly when biologically dangerous drives must be inhibited. In this manner, the taboo promotes the development of pretense, secrecy, and the consciousness of fictitiousness. Simple inhibition, however, is, for practical purposes, useless and is soon replaced by positive behavior. In this context, Werner refers to the taboo of mentioning a dead person's name. Because it is impractical to avoid mentioning the name of a dead person, a substitute name is created. For the purpose of communication, the substitute must be similar to the real name. At the same time, the substitute must not be too similar to the real name, because this would violate the taboo. As a result, the substitute name must simultaneously have the functions of revealing and concealing the real name.

According to Werner, the true metaphor arises in the context of the work of the magician. The necessity to protect himself against evil *pneuma* is particularly pressing for the magician, whose attempt to influence *pneuma* can, if discovered by the inappropriate persons or forces, turn against him. As a consequence, the magician is confronted with a dilemma. On the one hand, the pneumatic belief that related and similar *pneuma* attract each other forces him to create a model that imitates the appearance of the real thing so that model is capable of exerting its magical power. On the other hand, his desire for secrecy forces him to make the similarity between model and real object vague enough that it is not understood by an uninitiated audience. The magician thus faces the conflict between striving toward perfect mimesis and striving toward concealment. The magician resolves this conflict by using paraphrasis. Thus, for moments, the magician must step out of his pneumatic world view and take an external perspective, the perspective of his audience, onto his magic (Werner, 1919, p. 74). The magician simultaneously experiences incongruence and similarity, which are the characteristic features of true metaphors.

Werner examines a vast amount of ethnological data from different continents that, in his opinion, support the thesis that taboo is a prerequisite for the development of metaphor. Cultures (e.g., nomadic cultures) without taboo show no evidence of the use of metaphors, while cultures with taboo show evidence of the use of metaphors. Cultures with rudimentary taboo show poorly developed use of metaphors, while cultures with elaborate taboo show highly developed use of metaphors. Highly developed cultures without taboo use scarcely any metaphors, which shows that the emergence and use of metaphors is not just a function of the level of cognitive development but depends on the presence of taboo.

While the taboo is initially based on an inhibitory tendency that was originally at a maximum, the inhibitory tendency is progressively reduced with the attenuation of the taboo. Residues of the taboo are retained in the use of

metaphors for ridicule, warning, and threat. Finally, in irony and flattery, which represent the highest stage of metaphorical development, the taboo is negated and disappears.

Thus, the use of metaphors is originally subordinated to vital needs and serves the purpose of self-protection. True metaphors arise in taboo cultures when magicians take the perspective of an audience onto their actions. This explanation is reminiscent of Mead's (1934) idea that self-consciousness arises when a person takes the attitude of another toward herself. Whereas Mead derives the development of perspective taking skills from reciprocal social interactions, Werner does not explain how perspective-taking skills develop or how they generalize from the magician to other members of the cultural group. It is more likely that the perspective-taking skills Werner has in mind might have developed in the process of communicating about something that is taboo (e.g., a dead person; see Bühler, 1990, pp. 403–405, for a more extended criticism of Werner's theory of the origins of metaphor).

Origins of Lyric

In the introduction to the book on the origins of lyric, Werner (1924a, pp. 1–4) engages in a discussion of the concept "primitive," and describes the organization of primitive mentality and function (***Leistungsform***). The concept primitive describes a particular organization of cognitive structures, and is not to be understood in a moralistic manner (see also Werner & Kaplan, 1956). Drawing on Goethe, Werner (1924) uses the term's lack of differentiation and centralization to characterize primitive cognitive organization (e.g., unanalyzed, diffuse, instable, complexes) and primitive function (e.g., no differentiation between feeling, movements, perception, and representation).

The undifferentiated cognitive organization and function produces the magical attitude. In the magical attitude, the undifferentiated complexes take on the belief that only the whole of each kind, the action as well as the appearance, is magically effective. The cognitive instability is illustrated by the malleability of content, which imputes haphazard meaning to every appearance: at one moment, winding liana may have the magical meaning of love medicine, but at the next moment the liana may have the magical meaning of deadly entanglement. The magical attitude uses the relative instability of perception to subordinate everything to magical service. Concepts are not put into logical relation but fused with each other. For example, each model that is used for magical purposes is considered identical to the real desired object or event. Although in the magical attitude there is no differentiation between intuition and conceptual thought, the emergence of the magical attitude still means a progress in the direction of magical centralization.

The lack of differentiation of cognitive organization manifests itself in the aesthetic works and functions of primitive cultures. Works of art are diffuse in that the aesthetic object is barely differentiated from objects of nature and objects of use. At the same time, the aesthetic objects of different kinds of art are not differentiated from each other. For example, dance and song, and painting and gesture are fused

into a complex whole. Similarly, in primitive cultures, aesthetic functions are fused, artistic creation is charged with motives external to aesthetics ("außerästhetisch"), and artistic life is not separated from daily routines, religion, and science. In the course of cultural development, the aesthetic function differentiates itself from other functions and dominates the creation of works of art, which leads to the creation of a specifically aesthetic object. As a consequence, poetic forms come to constitute an independent reality, governed by its own rules and values. In primitive cultures, poetic formations do not constitute an independent reality. A self-contained world of poetic forms is constructed only when the aesthetic sphere differentiates from other realities and subordinates the other realities to its motives. Werner examines this process of aesthetic development for the content, motivation, and the general form of primitive lyric.

In primitive lyric, language is fused with song and body movement and is used for the expression of subjective, affective states at the expense of objective states of affairs. These characteristics explain the two main types of primitive lyric that can be found in the periods of the pre-magical and magical attitude. The first type is the meaningless song, characterized by the direct discharge of mostly functionally pleasurable affective-motor excitement into vocalizations and movements. The second type consists of short, interjection-like extemporaneous utterances (***Extemporale***) that express a total feeling. Higher forms of poetry develop from this second type of primitive lyric. In contrast to the first type of lyric, the motivations of logical lyric are not pleasurable feelings but mostly displeasurable and negative feelings (e.g., songs dealing with the desire for food or sexual intercourse, songs of sorrow). Initially, the displeasurable affect erupts in interjections, but gradually these interjections become expressions of the desire or sorrow. As a result, the subjective feeling and the ego are objectified in extemporaneous songs. With this turn toward the object coincides a turn toward the ego:

> Lyric does not want to be merely the subjective eruption and release of inner tensions, but it wants to be a substitute or continuation of real pleasure. Thus, the objectification of the feeling through the representation of the desired object is tantamount to the realization of the desire. This objectification and realization of the feeling not only results in a more pregnant determination of the desired object or event, but (by means of a more distinct differentiation between ego and world) also results in a more precise determination of the ego. (Werner, 1924, p. 26, my translation).

The objective determination of the desirable characteristics of the self is therefore a sign of higher lyrical motivation. For example, whereas primitive songs express sexual desire by describing the object of desire, more developed songs magically enhance the ego.

At the pre-magical stage, the function of lyric is to be a substitute for reality. At the magical stage, lyric is an auxiliary to attain the desired objects. By contrast, the function of higher forms of lyric is not a substitute for reality or wish fulfilment but the creation of aesthetic objects that are posited in a sphere of irreality, which is the

sphere of poetic reality. Werner summarized the different motivations underlying more primitive and higher lyric as follows:

> The function of more primitive lyric is the annihilation of the (complex, ego-centered) affect in the taken-for real world of the lyrically represented objects; the function of higher lyric is the re-evaluation (***Umwertung***) of the . . . affect, its distancing (***Entrückung***) into a more and more clearly developing poetic reality (Werner, 1924, p. 28, my translation).

The process of objectification of feelings is also manifest in the forms of lyrical expression. Eventually, at the stage of symbolizing poetry, lyrical forms objectify the whole feeling within the aesthetic sphere. For example, the Polynesian song of mourning "Our clothes are mourning greens and flowers! The flowers which are mourning" does not express feelings symbolically, because non-natural facts (i.e., human feelings) are imposed on objects of nature (Werner, 1924, p. 35). By contrast, the expression "wilted flowers" would accomplish the complete objectification of the feelings, and aesthetic intuition would constitute a self-contained system.

The remainder of the book examines how linguistic form elements of lyric (ellipse, repetition, and parallelism) and a-logical form elements of lyric (simile, rhythm, meter, and rhyme) develop in the pre-magical and magical periods. Werner shows that affective-motor experiences constitute the basis for each form element. In the chapter on rhythm and meter, he draws heavily on his earlier work (1917, 1918, 1919). Rhythm is defined as a structured and centered gestalt, because it consists of the opposition of stressed and unstressed parts and is centered on the stressed parts (see also Werner, 1919). Rhythm originates in synchronous motor movements (e.g., dance). If the motor movements are repeated, they are given a temporal determination and localization such that the duration between two motor movements is consciously experienced and the movements constitute a series. Rhythm results when, in order to establish a relation between the movements, certain movements are stressed. Werner considers the emergence of rhythm as a self-organizing process:

> If there is an incentive (***Antrieb***), carried by different motor areas, to put into relation and to repeat motor movements, rhythm organizes itself. . . . If not disturbed or dominated by external inhibitions, rhythm is pure motility in its psychologically most simple expression. (Werner, 1924, p. 116, my translation).

Rhythm is initially expression of a total affective-motor state; only at a later stage of development is rhythm used as a conscious means of expression. Because rhythmic expression is an integral part of the total state, it cannot be understood by an observer without re-enacting the total emotional state. Rhythm thus contains a transfer of emotions and feelings and has a strong suggestive force (Werner, 1924, p. 123). Although Werner acknowledges the important social-psychological effects of rhythm, he rejects Bücher's (1899) thesis that collective work is the basis for rhythm. According to Werner (1924, p. 125), Bücher did not take into account that "the psychological unit is pre-existent to the social unit; the psychological

unit creates, for physiological and psychological reasons, rhythm as the a perfect expression of internal tensions.... Labor is a late, even very late root of rhythm" (Werner, 1924, p. 125, my translation; see also Vygotsky, 1971, pp. 244–245).

Continuity with Later Writings

In the books on metaphor and lyric, Werner formulates key ideas of his developmental theory that are characteristic of his later work (Werner, 1926/1948, 1957, Werner & Kaplan, 1963). The principle of shift of motive (Werner, 1919; from 1924 on, Werner, calls it shift of function) figures prominently in the work on symbol formation (Werner & Kaplan, 1963, pp. 18, 60). However, in his earlier work—and to some extent, even in his later work—he does not specify the processes that lead to a change in motive or function and pays only scant attention to the dialectic relation between function and form. The dialectic between form and function is better captured by Wundt's (1908) concept of heterogeneity of purposes (***Heterogonie der Zwecke***). According to Wundt, each form of art originates in vital needs that serve as the motives for the production of objects for practical purposes; the forms of these objects then work as incentives for the production of new objects and inspire ideas about new forms.

There are further, more specific lines of continuity between Werner's books on metaphor and his later work. For example, the notion of distancing that is elaborated in the book on lyric takes center stage in the theory of symbol formation (Werner & Kaplan, 1963). Another example is the biological-psychological perspective that all human creations grow out of pressing vital needs. Aesthetic-expressive phenomena are by-products of the struggle to satisfy practical needs (see also Mach, 1906, p. 85; Vygotsky, 1971). In later writings, the biological-psychological perspective is also coupled with the rejection of the concept of subjective teleology (Werner & Kaplan, 1963, p. 6; see already Krueger, 1915).

By 1924, Werner had formulated the essentials of his orthogenetic principle (Werner, 1926/1948, 1957). In part, the orthogenetic principle was developed in the context of elaborating on a developmental-psychological theory of the arts; in part, it arose in the context of Werner's research on perception that took place at the same time (see chapter 2 in this book). With the books on metaphor and lyric, Werner also immerses himself deeper into considerations about levels of functioning that differ radically from the mind-set of adults in highly developed countries. The occupation with the primordial stage of cognition increases in intensity in his period in Hamburg (1917 to 1933).

THE CONCEPT OF PHYSIOGNOMIC PERCEPTION: THE HAMBURG PERIOD (1917–1933)

After his arrival in Hamburg in 1917, and up to the mid-1920s, Werner engages in a series of empirical studies on intensity of sensations (1922, 1927) and the structural laws of perceptual-motor phenomena (Werner, 1924a, 1924b, 1925, 1926;

Werner & Creutzer, 1927; Werner & Lagercrantz, 1924; Zietz & Werner, 1927). The publication of his ***opus magnum***, the book on development from a comparative perspective, also falls in the Hamburg period (1926). In this section, Werner's work on perception and sensation will be described only briefly (see Kreppner, chapter 2 in this book); the section will focus on his concept of physiognomic perception.

The intensity of sensations (i.e., ***qualia***) is approached from a phenomenological and microgenetic perspective (Werner, 1927; (see chapter 2 in this book; Valsiner & van der Veer, 2000). Following Mach (1987), Werner argued that from a developmental point of view, intensive sensations are initially experienced as complexes that are psychophysically undifferentiated with respect to subject and object. Complex intensities can be neither measured nor estimated. Measurement and estimation of intensities becomes possible only with the progression of intensities toward objective experience, when intensities are viewed as features of objects (Werner, 1927).

The studies on perceptual-motor phenomena apply a gestaltist-holistic framework, and, possibly under the influence of Cassirer, Werner also places more emphasis on the active, organizing role of the subject in the structuring of experience:

> A basic condition for the structuring of perceptual stimuli is the bodily attitude, an adequate, dynamic tension; the human being as a dynamic-living totality has to structure himself to give the optical field as a part of his psychophysical organisms a figure. (Werner, 1930, p. 230, my translation).

Methodologically, the studies on perception expose participants—mostly Werner's colleagues and students—to specific stimulus configurations and asks them to report their experience. Several of these papers focus on the distinction between different levels of structuration in adult perception (e.g., Werner, 1924a, Werner, 1925; Werner & Creuzer, 1927; Zietz & Werner, 1927).

In 1925 (see Werner, 1955, p. 11), Werner formulates the concept of physiognomic perception, which leads to the elaboration of the non-logical, non-rational stage of functioning that he had described in his books on metaphor and lyric. Physiognomic perception refers to a primodial way of being-in-the-world, in which objects are experienced in a pre-objective, expressive way. Physiognomic perception is contrasted with the objective-technical (***sachlich-technisch***) apprehension of the world, in which things are determined by their properties:

> Before a human being recognizes that an object has specific properties, for example, a particular color, and that it consists of characteristic parts, he grasps the object as a whole; he grasps the peculiar organism of the flower through the eye before he recognizes any particular features, he apprehends the inner movement, which reveals, from its roots to the cup and the blossom, the law of its peculiar growth. This inner, liveliness... which belongs to all things as far as they 'speak' to us, can be felt as the expression of things. Things loose their expression as soon as we grasp them conceptually, analyze them, and abstract their properties (Werner, 1932, p. 2, my translation).

Each object can be perceived from either an objective-technical or a physiognomic point of view. For example, the color "red" is perceived from the objective-technical point of view when it is perceived as the property of an object. By contrast, "red" is perceived physiognomically (as having a "face") when it is experienced as having a lively, burning, forceful, and energetic expression. Physiognomic perception developmentally precedes and, in adults, exists alongside the logical-intellectual grasp of the world.

Werner (1932) acknowledges that the study of the content of physiognomic perception presents methodological problems because the relation between part and whole is a completely different physiognomic perception than it is in the sphere of gestalts with formal properties (e.g., squares). Gestalts with formal properties have holistic qualities, but their parts can be isolated or at least be focused without destroying the whole. For example, we can see that a square is structured into sides because the grasp of the parts does not destroy the whole. In a physiognomic gestalt, however, analytical decomposition of the whole into parts leads to destruction of the dynamic, to a freezing and geometrization of the form. For example, the specific characteristics of a face are destroyed if analyzed into individual parts. If eyes are looked at in isolation, e.g., by covering the whole face but leaving little slits for the eyes, then the eyes may look like glass beads or colorful bubbles, but they lose the specific character of being the mirror and center of the face. "The ensouled center of the face has... become a physical part of the body" (Werner, 1932, p. 50, my translation). Still, the study of physiognomic perception cannot omit analysis as a means of scientific research. However, this analysis cannot proceed in a geometric way but must take the forms of expression as meaningful, indivisible wholes.

Werner creates the microgenetic method to study how the structuring of perception (***Aktualgenese***) originates in and develops out of physiognomic perception (see Valsiner & van der Veer, 2000). To study this developmental process, objects must be displayed under labile and poorly structured conditions and not under well-articulated and highly structured conditions. In other words, the process of structuring that usually runs off quickly and unnoticed must be artificially interrupted. In order to achieve this, Werner briefly presents diverse stimuli (mostly words) with a tachistoscope and asks participants to report their experience. Stimulus presentation is continued until the participants have formed a stable and structured percept.

On the basis of his findings, Werner (1932) suggests that physiognomic perception has the following features. First, and most important, when objects are perceived physiognomically, they are characterized by an all pervasive dynamic and inner tension. It is this dynamic that distinguishes phenomena of physiognomic perception from those of objective-technical perception. By contrast, Gestalt concepts are insufficient to capture the specific characteristic of physiognomic perception because these concepts apply indifferently to phenomena of both physiognomic perception and objective-technical perception.

Second, objects apprehended physiognomically are psycho-physically neutral or indifferent in that the living body is not yet separated into physical body and

soul, inner and outer. In this context, Werner draws on the devastating criticism that Scheler (1913) directed against the (currently fashionable, see Gopnik, Meltzoff & Kuhl, 2001; Tomasello, 1999) assumption that we infer the emotional states of other people by analogy to our own emotional states. Following Plessner and Buytendijk (1925), Werner suggests that we initially perceive psycho-physically neutral personal attitudes (see Hobson, 1993).

The third feature of physiognomic perception is that expressive phenomena are experienced as intrinsically meaningful. Furthermore, the meaning of expressive phenomena is not tied to any particular sensory domain, but is intersensorial, i.e., the expression can be experienced optically, acoustically, or tactilely. Werner adopts the romanticist idea that initially all senses flow together in one common feeling, the ***sensorium commune*** (see Herder, 1971). The idea of the ***sensorium commune*** explains the existence of synaesthetic experiences in which, for example, sounds are simultaneously experienced as colorful and colors as sounding (Werner, 1934). Experimental support for the ***sensorium commune*** comes from the findings that stimuli presented to different sensory domains influence each other (Zietz & Werner, 1927) and that the organization of a stable and articulated perceptual world is rooted in and develops out of vital sensations (Werner, 1930, 1934). Vital sensations are subjective, bodily, affective-motor feelings or attitudes. For example, in a vital tonal experience, the tone is felt in the body of the listener. One of Werner's subjects describes this experience as follows: "I am filled with sound, as if I were a violin or bell" (see Werner, 1934, p. 162).

Language is most suitable for the study of physiognomic perception (Werner, 1927, 1928, 1932). Language can be considered either as a system of signs or as an objective reality. If considered as an objective reality, language takes on an expressive-pictorial character and words become bodies with a peculiar substantial quality. Expressive, physiognomic language differs from the conceptual use of linguistic signs: whereas the former illuminate a particular, subjective aspect of a concept, the latter have a general meaning. For example, from a conceptual perspective, the word "soap" (***Seife***) is determined by the number of features that are necessary and sufficient to grasp the essence of all kinds of soap. From a physiognomic perspective, the word is perceived as having a drawn out, smearing quality without fixed form and consistency. Physiognomic perception does not just mean an object; the expressive meaning is directly perceived in the sound. Sounds and sound connections receive their expressive quality from the sphere of meaning. Only in the context of the meaning of a word, sentence, or speech, and only in reference to a particular language system, can the expressive character of sounds be understood. Following Humboldt and Herder, Werner states that sound and meaning (i.e., matter and form) penetrate each other such that every word is the sounding expression of an idea.

Werner's (1932) book on physiognomic language deals with principles of modeling expression, the physiognomy of word classes and syntax, and individual differences in the physiognomic perception of language. Werner (1930) also examined the physiognomic perception of language from a comparative perspective,

inferring from differences in the physiognomic perception of words that in different languages have a similar reference (e.g., ***Seife*** and soap) to the mind-set and attitudes of the respective language community.

Continuity with Later Work

Werner continued his work on the perception and physiognomic perception of language at Clark University, and a number of empirical studies on these topic are summarized in various articles and books (e.g., Werner, 1955; Werner & Kaplan, 1963; Werner & Wapner, 1952). Interestingly, the concepts of ***sensorium commune*** and direct perception of emotion gain increasing attention in contemporary psychology (Hobson, 1993; Sroufe, 1996).

CONCLUSION: DEVELOPMENT OF A DEVELOPMENTALIST

Werner's development of ideas has a long history. Werner's early writings reflect the influence of Mach and Stöhr, and that his interest in aesthetic-expressive phenomena is due to the intellectual-cultural climate of fin-de-siècle Vienna. Werner's reception of Krueger's work on development then led to a deepening of Werner's approach to development.

In the course of the writings that stretch from the Vienna to the Hamburg period, we observe that the developmental perspective becomes increasingly pronounced and expanded in Werner's work. First, he applies the developmental perspective to concepts, then to metaphor and lyric and, eventually, to perception. With the radicalization of the concept of development goes an "aesthetization" of perception, because physiognomic perception is characteristic of the aesthetic sphere (Werner, 1932, p. 4). Thus, the radicalization of the concept of development coincides with the radicalization of aesthetics. In this manner, the concepts of development and physiognomic perception integrate the diverse areas of Werner's interest that were unrelated in his early work.

With the concept of physiognomic perception, Werner arrives at a primoridal way of being in the world. Werner's idea that the initial and fundamental apprehension of the world is not logical-rational but expressive influenced Cassirer's (1957) philosophy of symbolic forms as well as Merleau-Ponty's (1962) phenomenology of perception. As Werner (1932) points out, a serious shortcoming of psychology is that it has mostly studied logical-analytical thought and forms of cognition in which objects are unambiguous and precisely determined. "The living world of things, in which the human being participates with his feelings, strivings and reflections, does virtually not exist for this psychology [i.e., the psychology studies geometrical-technical perception, U. M.]; but only the cold, thing-like, and distanced world of relative closure, which in truth is hardly ever realized" (Werner, 1932, p. 2). Given that developmental psychologists today consider even the infant

a little scientist (Gopnik et al., 1999), Werner's remarks are even more relevant now than they were in 1932.

REFERENCES

Ash, M. G. (1985). Die experimentelle Psychologie an den deutschsprachigen Universitäten von der Wilhelminischen Zeit bis zum Nationalsozialismus [Experimental psychology at german-speaking universities from the Wilhelmian period to national socialism]. In M. G. Ash & U. Geuter (Eds.), *Geschichte der deutschen Psychologie im 20. Jahrhundert* (pp. 45–82). Opladen: Westdeutscher Verlag.

Austeda, F. (1974). Einleitung [Introduction]. In A. Stöhr, *Philosophische Konstruktionen und Reflexionen* (Ed. F. Austeda, pp. 1–13). Wien: Verlag Franz Deuticke.

Benetka, G. (1995). *Psychologie in Wien: Sozial- und Theoriegeschichte des Wiener Psychologischen Instituts* [Psychology in Vienna: Social and theoretical history of the Psychological Institute in Vienna]. Wien: WUV-Universitätsverlag.

Berlage, A. (1992). *Empfindung, Ich und Sprache um 1900: Ernst Mach, Hermann Bahr und Fritz Mauthner im Zusammenhang* [Sensation, ego, and language around 1900: Ernst Mach, Hermann Bahr, and Fritz Mauthner in context]. Frankfurt am Main: Peter Lang.

Bücher, K. (1902). *Arbeit und Rhythmus* (Labor and rhythm; 3rd ed.). Leipzig: B. G. Teubner.

Blackmore, J. T. (1978). Three autobiographical manuscripts by Ernst Mach. *Annals of Science, 35*, 401–418.

Bühler, K. (1919). *Die geistige Entwicklung des Kindes* [Mental development of the child]. Jena: Fischer.

Bühler, K. (1990). *Theory of language* (transl. By D. F. Goodwin). Amsterdam: John Benjamins Publishing Company. (Original work published in 1934)

Cassirer, E. (1957). *The philosophy of symbolic forms* (Vol. 3). New Haven, CT: Yale University Press. (Original work published in 1929)

Geuter, U. (1985). Das Ganze und die Gemeinschaft—Wissenschaftliches und politisches Denken in der Ganzheitspsychologie Felix Kruegers [The whole and the community—Scientific and political thought in the holistic psychology of Felix Krueger]. In C. F. Graumann (Ed.), *Psychologie im Nationalsozialismus* (pp. 55–87). Berlin: Springer.

Gopnik, A., Meltzoff, A. N., & Kuhl, P. K. (1999). *The scientist in the crib: Minds, brains, and how children learn.* New York: William Morrow and Company, Inc.

Glick, J. A. (1992). Werner's relevance for contemporary developmental psychology. *Developmental Psychology, 28*, 558–565.

Haller, R. (1988). Grundzüge der Machschen Philosophie [Essentials of Mach's philosophy]. In R. Haller & F. Stadler (Eds.), *Ernst Mach: Werk und Wirkung* (pp. 64–86). Wien: Hölder-Pichler Tempsky.

Herder, J. G. (1966). Essay on the origin of language. In J. H. Moran & A. Gode (Eds.), *On the origin of language* (pp. 87–166). New York: Frederick Ungar Publishing, Co. (Original work published in 1772)

Herrmann, T. (1978). Ganzheitspsychologie und Gestalttheorie [Holistic psychology and Gestalt theory]. In H. Balmer (Ed.), *Psychologie des 20. Jahrhunderts, Vol. 1: Die europäische Tradition* (pp. 572–658). Zürich: Kindler Verlag.

Hobson, R. P. (1993). *Autism and the devleopment of mind.* Hove, UK: Lawrence Erlbaum Associates Limited.

Jacobson, R., & Cross, S. K. (1955). Aphasia as a linguistic problem. In H. Werner (Ed.), *On expressive language* (pp. 69–81). Worcester, MA: Clark University Press.

Janik, A., & Toulmin, S. (1973). *Wittgenstein's Vienna.* New York: Simon & Schuster.

Johnston, W. M. (1972). *The Austrian mind: An intellectual and social history 1848–1938.* Berkeley: University of California Press.

Kaplan, B., & Wapner, S. (1960). Introductory remarks. In B. Kaplan & S. Wapner (Eds.), *Perspectives in psychological theory: Essays in honor of Heinz Werner* (pp. 13–19). New York: International Universities Press, Inc.

Krueger, F. (1915). *Über Entwicklungspsychologie* (On developmental psychology). Leipzig: Verlag von Wilhelm Engelmann.

Krueger, F. (1924). Der Strukturbegriff in der Psychologie. In *Bericht über den 8. Kongreß für experimentelle Psychologie in Leipzig 1923* (pp. 31–56). Jena: Fischer.

Langer, J. (1969). *Theories of development.* New York: Holt, Rinehart, and Winston, Inc.

Langer, J. (1970). Werner's theory of development. In P. H. Mussen (Ed.), *Carmichael's manual of child psychology, Vol. 1* (3rd ed., pp. 733–771). New York: Wiley.

Langer, J., & Sugarman, S. (1978). Die Entwicklungstheorien von Heinz Werner und Jean Piaget [The developmental theories of Heinz Werner and Jean Piaget]. In G. Steiner (Ed.), *Die Psychologie des 20. Jahrhunderts, Band 7: Piaget und die Folgen* (pp. 568–583). Zürich: Kindler Verlag.

Lotze, H. (1885). Microcosmus: An essay concerning man and his relation to the world (transl. by E. Hamilton & E. E. C. Jones). Edinburgh: T. & T. Clark.

Mach, E. (1903). *Populär-wissenschaftliche Vorlesungen* [Popular-scientific lectures]. Leipzig: Barth.

Mach, E. (1906). *Erkenntnis und Irrtum* (2nd edition) [Knowledge and error]. Leipzig: Barth.

Mach, E. (1987). *Die Analyse der Empfindungen und das Verhältnis des physischen zum psychischen* [The analysis of sensations and the relation of the physical to the psychical]. Darmstadt: Wissenschaftliche Buchgesellschaft. (Original work published in 1902)

Mach, E. (1960). *The science of mechanics: A critical and historical account of its development* (trans. By T. J. McCormack). LaSalle, Ill: Open Court. (Original work published 1904)

Mead, G. H. (1934). *Mind, self, and society from the standpoint of a social behaviorist.* Chicago: The University of Chicago Press.

Merleau-Ponty, M. (1962). *The phenomenology of perception.* New York: Humanities Press. (Original work published in 1945)

Musil, R. (1979). *The man without qualities, Vol. 1* (translated by E. Wilkins & E. Kaiser). London: Pan Books. (Original work published in 1930)

Piaget, J. (1976). Autobiographie. *Revue Européenne des Sciences Sociales, 14,* 1–43.

Plessner, H., & Buytendijk, F. J. J. (1983). Die Deutung des mimischen Ausdrucks: Ein Beitrag zur Lehre vom Bewusstsein des anderen Ichs (The interpretation of mimic expression: A contribution to the theory of consciousness of the alter ego]. In H. Plessner, *Gesammelte Werke* (Vol. VII, pp. 69–129). Frankfurt am Main: Suhrkamp. (Original work published in 1925)

Prinz, W. (1985). Ganzheits- und Gestaltpsychologie und Nationalsozialismus [Holistic and Gestalt psychology and national socialism]. In C. F. Graumann (Ed.), *Psychologie im Nationalsozialismus* (pp. 89–111). Berlin: Springer.

Scheerer, E. (1985). Organische Weltanschauung und Ganzheitspsychologie [Organic world view and holistic psychology]. In C. F. Graumann (Ed.), *Psychologie im Nationalsozialismus* (pp. 15–53). Berlin: Springer.

Scheler, M. (1954). *The nature of sympathy.* Routledge & Kegan Paul. (Original work published in 1913)

Schorske, C. E. (1961). *Fin-de-siècle Vienna: Politics and culture.* New York: Random House.

Sommer, M. (1987). *Evidenz und Augenblick. Eine Phänomenologie der reinen Empfindung* [Evidence and moment: A phenomenology of pure sensation]. Frankfurt am Main: Suhrkamp.

Sommer, M. (1988). Denkökonomie und Empfindungstheorie bei Mach und Husserl—Zum Verhältnis von Positivismus und Phänomenologie [Thought economy and theory of sensation in Mach and Husserl—On the relation between positivism and phenomenology]. In R. Haller & F. Stadler (Eds.), *Ernst Mach: Werk und Wirkung* (pp. 309–328). Wien: Hölder-Pichler Tempsky.

Sroufe, A. L. (1996). *Emotional development: the organization of emotional life in the early years.* Cambridge: Cambridge University Press.

Stadler, F. (1988). Ernst Mach—Zu Leben, Werk und Wirkung [Ernst Mach: Life, work, and impact]. In R. Haller & F. Stadler (Eds.), *Ernst Mach: Werk und Wirkung* (pp. 11–57). Wien: Hölder-Pichler Tempsky.

Stern, C., & Stern, W. (1965). *Die Kindersprache* (4th ed.) [Children's language]. Darmstadt: Wissenschaftliche Buchgesellschaft. (Original work published in 1907)

Stöhr, A. (1910). *Lehrbuch der Logik in psychologisierender Darstellung* [A textbook of logic from a psychologistic perspective]. Leipzig: Verlag Franz Deuticke.

Stöhr, A. (1917). Psychologie. Wien: Deuticke.

Stöhr, A. (1974). *Philosophische Konstruktionen und Reflexionen* [Philosophical constructions and reflections] (Ed. F. Austeda). Wien: Verlag Franz Deuticke.

Tomasello, M. (1999). *The cultural origins of human cognition.* Cambridge, MA: Harvard University Press.

Valsiner, J., & van der Veer, R. (2000). *The social mind: Construction of the idea.* Cambridge: Cambridge University Press.

Von Allesch, C. G. (1987). *Geschichte der psychologischen Ästhetik* [History of psychological aesthetics]. Göttingen: Hogrefe Verlag.

Vygotsky, L. S. (1971). *The psychology of art.* Cambridge, MA: MIT Press. (Original work published in 1925)

Vygotsky, L. S. (1986). *Thought and language* [transl. By A. Kozulin]. Cambridge, MA: MIT Press. (Original work published in 1934)

Werner, H. (1912a). Begriffstafel auf genetischer Grundlage [A concept table on genetic foundation]. *Archiv für systematische Philosophie, 18,* 45–62. [Partly reprinted in S. S. Barten & M. B. Franklin (Eds.) (1978), *Developmental processes: Heinz Werner's selected writings, Vol. 1: General theory and perceptual experience* (pp. 9–21). New York: International Universities Press, Inc.

Werner, H. (1912b). Ein Beitrag zur Lehre logischer Substitution [A contribution to the theory of logical substitution]. *Archiv für systematische Philosophie, 18,* 431–444.

Werner, H. (1913a). Über künsterlerisch-individuelle Prozesse [On artistic-individual processes]. *Archiv für systematische Philosophie, 19,* 429–441.

Werner, H. (1913b). Untersuchungen über den "blinden Fleck" [Investigations into the blind spot]. *Pflüger's Archiv für die gesamte Physiologie, 153,* 475–490.

Werner, H. (1913c). Ein Phänomen optischer Verschmelzung [A phenomenon of optical fusion]. *Zeitschrift für Psychologie, 66,* 263–270.

Werner, H. (1914). Eine psychophysiologische Theorie der Übung [A psychophysiological theory of practice]. *Vierteljahresschrift für wissenschaftliche Philosophy und Soziologie, 38,* 417–441.

Werner, H. (1915). Begriffspsychologische Untersuchungen [Investigations into the psychology of concepts]. *Archiv für systematische Philosophy, 21,* 162–172.

Werner, H. (1918). Über optische Rhythmik [On optical rhythm]. *Archiv für die gesamte Psychologie, 38,* 115–163.

Werner, H. (1919). *Die Ursprünge der Metapher* [The origins of metaphor]. Leipzig: Verlag von Wilhelm Engelmann. [Partly reprinted in S. S. Barten & M. B. Franklin (Eds.) (1978), *Developmental processes: Heinz Werner's selected writings, Vol. 2: Cognition, language, and symbolization* (pp. 353–384). New York: International Universities Press, Inc.]

Werner, H. (1922). *Grundfragen der Intensitätspsychologie* [Basic questions of the psychology of intensive qualities]. *Zeitschrift für Psychologie,* Supplement 10 (whole number).

Werner, H. (1924a). *Die Ursprünge der Lyrik* [The origins of lyric]. München: Ernst Reinhardt Verlag.

Werner, H. (1924b). Studien über Strukturgesetze I: Über Strukturgesetze und deren Auswirkung in den sogenannten geometrisch-optischen Täuschungen [Studies on structural laws I: On structural laws and their effect on so-called gemotrical-optical illusions]. *Zeitschrift für Psychologie, 94,* 248–264.

Werner, H. (1924c). Studien über Strukturgesetze II: Über das Problem der motorischen Gestaltung [Studies on structural laws II: On the problem of motoric organization]. *Zeitschrift für Psychologie, 94,* 265–272.

Werner, H. (1925). Studien über Strukturgesetze IV: Über Mikromelodik und Mikroharmonik [Studies on structural laws IV: On micromelodies and mircoharmonies]. *Zeitschrift für Psychologie, 98,* 74–89.

Werner, H. (1926a). *Einführung in die Entwicklungspsychologie* [Introduction into developmental psychology]. Leipzig: Barth.

Werner, H. (1926b). Studien über Strukturgesetze V: Über die Ausprägung von Tongestalten [Studies on structural laws V: On the formation of sound gestalts]. *Zeitschrift für Psychologie, 101,* 159–181.

Werner, H. (1927). Ueber die Intensität der Empfindungen [On the intensive qualities of sensations]. In *8th International Congress Psychological Proceedings and Papers* (pp. 85–93). Groningen: Nordhoff.

Werner, H. (1927b). Ueber physiognomische Wahrnehmungsweisen und ihre experimentelle Prüfung [On physiognomic perception and their experimental study]. In *8th International Congress Psychological Proceedings and Papers* (pp. 443–446). Groningen: Nordhoff.

Werner, H. (1930a). Untersuchungen über Empfinden I: Das Problem des Empfindens und das Problem seiner experimentellen Prüfung [Studies on sensation I: The problem of sensation and the problem of its experimental study]. *Zeitschrift für Psychologie, 114,* 152–166.

Werner, H. (1930b). Untersuchungen über Empfinden II: Die Rolle des Sprachempfindens im Prozess der Gestaltung ausdrucksmässig erlebter Worte [Studies on sensation II: The role of language intuition in the process of forming expressively experienced words]. *Zeitschrift für Psychologie, 117,* 230–254.

Werner, H. (1932). *Grundfragen der Sprachphysiognomik* [Basic issues of the physiognomy of language]. Leipzig: Barth.

Werner, H. (1948). *Comparative psychology of mental development* (3rd ed.). New York: International Universities Press.

Werner, H. (1955). "Expressive language" and the expressive function of poetry. In H. Werner (Ed.), *On expressive language* (pp. 11–18). Worcester, MA: Clark University Press.

Werner, H. (1957). The concept of development from a comparative and organismic point of view. In D. B. Harris (Ed.), *The concept of development: An issue in the study of human behavior* (pp. 125–148). Minneapolis: University of Minnesota Press.

Werner, H. (1978). Unity of the senses. In S. S. Barten & M. B. Franklin (Eds.), *Developmental processes: Heinz Werner's selected writings, Vol. 1: General theory and perceptual experience* (pp. 153–167). New York: International Universities Press, Inc. (Original work published in 1934)

Werner, H., & Kaplan, B. (1956). The developmental approach to cognition: Its relevance to the psychological interpretation of anthropological and ethnolinguistic data. *American Anthropologist, 58,* 866–880.

Werner, H., & Kaplan, B. (1963). *Symbol formation.* New York: Wiley.

Werner, H., & Wapner, S. (1952). Toward a general theory of perception. *Psychological Review, 59,* 324–338.

Witkin, H. A. (1965). Heinz Werner: 1890–1964. *Child Development, 36,* 307–328. Wundt, W. (1862). *Theorie der Sinneswahrnehmung* [Theory of sense perception]. Leipzig: C. F. Winter'sche Verlagshandlung.

Wundt, W. (1916). *Elements of Folk Psychology: Outlines of the development of mankind.* London: George Allen & Unwin Ltd. (Original work published in 1912)

2

HEINZ WERNER AND THE PSYCHOLOGICAL INSTITUTE IN HAMBURG

Kurt Kreppner

In this contribution, Werner's time in Hamburg from 1917 to 1933 will be covered. My focus will be on Werner's multifaceted, comparative approach to development, and his attempt to link organismic-vitalistic with cultural and anthropological concepts. Werner went to Hamburg from Vienna and Munich in September 1917, to become an assistant to William Stern. Although Werner had already specialized on issues of aesthetic and psychophysiological phenomena and had a genuine interest in human development when he arrived in Hamburg, he was deeply influenced by Stern's conceptual approach linking experimental and humanistic-philosophical thinking in psychology. He was the first of Stern's assistants to complete the habilitation procedure at the University of Hamburg (in December 1920), and he became a *Privatdozent* in 1921. He gained an independent position when he was appointed to a professorship in 1926.

During the years from 1922 to 1933, Werner published numerous articles which show his broad interests, varying from basic issues, such as the law of structures, to very specific topics, such as the mutual influences of sound and color during perception. Moreover, during these years, Werner showed increasing involvement in basic concepts of developmental and comparative psychology, manifest in his famous *Einführung in die Entwicklungspsychologie*, which later became *Comparative Psychology of Mental Development* in the U.S. With regard to this approach, the influences in Werner's work of von Uexküll's vitalistic biology and Cassirer's humanistic and neo-Kantian approach in philosophy will be discussed. Furthermore, Werner's intellectual development in Hamburg between 1917 and 1933 and his

creative approaches centering on a holistic and humanistic psychology were a part of a larger perspective: William Stern's attempt to establish a new model of psychology. This new psychology was to reconcile organismic and mechanistic approaches, as well as to deal with both theoretical and practical questions in parallel.

When Heinz Werner arrived at Hamburg's Dammtor Bahnhof on Friday afternoon, September 21, 1917, Germany was still in the First World War. Werner was a new assistant for William Stern, who had been appointed the director of the new Psychological Institute at the "Vorlesungswesen" in 1915. Stern had begun his work in this institution March 1, 1916, and Werner arrived to substitute for Theodor Kehr, an assistant of the late Ernst Meumann (letter from Stern to Cohn 9/19/17, in Lück & Löwisch, 1994, p. 110). Kehr had served as the administrator of the Institute until Stern's arrival and was an important person because he represented the continuity between Meumann and the newly appointed Stern. Now, after Kehr's sudden death, Stern needed a person who fit into Kehr's profile of knowledge and experimental expertise on the one hand, and promised to move beyond Kehr and to establish more advanced experimental approaches on the other. When Werner arrived in Hamburg, what kind of psychological thinking did he encounter?

PSYCHOLOGY IN HAMBURG BEFORE WILLIAM STERN

Under the aegis of Meumann, a student of Wundt, psychology had changed its character considerably, from a theoretical and mostly philosophical subject to an empirical and educational science. Meumann, a well-known researcher in education had been offered a position in Hamburg in 1911. The reason for this offer in Hamburg was the intention to provide the education of teachers with an academic-scientific base. In only four years, Meumann had built up a kind of educational-psychological lab where a variety of experiments were conducted. This lab gained much reputation as a hub for basic educational research. During his time in Hamburg, Meumann had only one position for an assistant. From 1911 to 1913, the main assistant was Richard Goldschmidt, and after him came Gerhard Anschütz (1913–1915), who mainly helped built up and organize the big new laboratory of Meumann.

Theodor Kehr, Anschütz's successor, was responsible for runnng this laboratory. He was expected to hold the position for another two years, from 1915 to 1917. When Meumann suddenly died from a lung inflammation on April 26, 1915, he left a lab which, up to this time, had been run continuously by Anschütz. After his two years serving as an assistant for Meumann, Anschütz had accepted a professorship in Istanbul, Turkey, and had left Hamburg. Thus, Kehr was fully responsible not only for the lab but for the entire Institute.

Kehr had conducted a series of attention experiments and published a book *The Problem of Conscience* (1916). His studies had focused on phenomena of optical, acoustical and sensorimotor deceptions, rhythmizations, and other aspects of subjective perception mechanism; they represented the state of the art. In the interest

of Meumann, an extended series of experiments had been conducted investigating apperceptions and attention in children.

William Stern's Move to Hamburg

The decision to offer Meumann's position to William Stern—who was then in Breslau—came comparably quickly. After Spranger had declined the offer to come to Hamburg, the Hamburg Teachers' Association offered the position to Stern, who had gained high reputation among teachers for his research on personality, intelligence, and children's development (Stern, 1907, 1911, 1914, 1917; Stern & Stern, 1907, 1909). On the one hand, the teachers in Hamburg hoped that Stern would continue Meumann's excellent experimental work with regard to memory and learning. On the other hand, they expected further innovations in the broader area of teaching. Stern considered the offer a very attractive chance to become the director of an already renowned Institute that could provide new opportunities for his work. He had developed new interests in Breslau and intended to expand the area of practical psychology not only into the field of education but also in developmental psychology.

Breslau was not the ideal place for Stern. As a young scholar he had joined Ebbinghaus in Breslau after some unsuccessful attempts to get a position as assistant professor at the Berlin Institute under Carl Stumpf. Physiology and memory psychology had not been the preferred field of research in his years in Breslau, where he had the opportunity to expand his activities into new areas such as personality and differential psychology. Now, after nearly 19 extremely creative years in Breslau, Stern was confronted with the new directorship in Hamburg and the task to continue Meumann's well-known tradition of experimental work in education.

What Stern really found when he came to Hamburg after Meumann's death was a comparably small Institute. Kehr, the only official assistant, was sick and—as Stern writes in a letter to Jonas Cohn, the philosopher and friend (letter from Stern to Cohn 10/05/16, in Lück & Löwisch, 1994, p. 100–103)—exempted from military service because of a chronic lung disease for just three months. In addition to Kehr, there was one secretary, a part-time mechanic, a young voluntary student assistant without payment, and "Miss Meta Meumann," Meumann's sister, who seemed to be the best person to administer his private, 1,200 volume library, which he had donated the Hamburg Institute. Since Meumann had not left a fortune for his sister, she had to earn a living after her brother's death.

When Stern began work on March 1, 1916, he first organized Meumann's laboratory to set it to work under Kehr, and soon began to build up new contacts with the administration in Hamburg, particularly with the Teachers' Association and a new organization in Hamburg, ***Bund für Schulreform***, which intended to reform the German school system. Kehr suffered more and more from a lung disease during 1917 and could no longer do his duty in the Institute. This created a crisis since some urgent military research was on the agenda: the development of aptitude tests for war pilots and drivers. Stern hired Wilhelm Benary, a lieutenant from the German cavalry to substitute for Kehr in order to continue the important military

research. He continued Kehr's research until the end of the war. When Kehr died in August 1917, Stern immediately began to look for a successor to run the Meumann's laboratory and to continue Meumann's basic experimental educational research. He chose Heinz Werner.

THE PERSONALITY AND POTENTIAL OF HEINZ WERNER WHEN ARRIVING IN HAMBURG

Heinz Werner came directly from Munich, where he had accomplished some major laboratory experiments under Oswald Külpe and Karl Bühler. It seems that he had been much attracted to these two scientists, who had attempted to widen the field of experimental sensory psychology into domains that Wundt had for a long time strongly rejected as proper areas for psychophysiological research. Famous for—among other things—having initiated the new experimental approach to human thinking, well known as the "Würzburg School," both Külpe and Bühler already had some experience in the venture to carry experimental methodology into new areas where, within the framework of classical psychophysics, no "material substratum" could be measured. Werner had also conducted a series of experiments applying the Würzburg School methodology in Munich, and, if we take a closer look at his earlier work, already in Vienna.

When we analyze Werner's publications between 1912 and 1918—his studies conducted in Vienna and Munich—one aspect emerges immediately that may be significant for his further career in Hamburg. Although still young in years—27—he arrived in Hamburg as a person who had already extended his first excursion in the area of psychological research from pure physiological studies in perception (optical and acoustical stimulations) into the complex terrain of human thinking, such as the development of concepts and ideas. Furthermore, when he went from Vienna to Munich, he had already published on aesthetics and the process of creativity in artists and children. He left Vienna and the laboratory of Sigmund Exner to learn at another place—Munich—where two of the leading modern psychologists of his time tried to extend Wundt's psychophysiological approach to the complex and fascinating world of associations and thinking.

In Vienna, Werner had worked in such difficult psychological areas as basic logical thinking (1912a), formation of abstractions (1912b), and even creativity (1913d), as well as in more classical psychophysical domains like optical perception (blind spot phenomena or phenomena of optical fusion, etc.) (1913a, b), and practice (1913c). Thus, when Werner left for Munich, it seems as if he had already a specific scientific program in mind, the integration of the various inputs of the senses and the analysis of the dynamics of their inner representations. He was eager to learn from the two Würzburg School protagonists, Külpe and Bühler. Still working in a very technical psychophysical tradition, Werner already had cautiously extended his interests and research into more cognitive areas. There he tried to trace the development of abstractions and conclusions, topics far beyond purely psychophysical boundaries.

Thus, when Heinz Werner went to Hamburg, Stern knew well that this young man already had a distinguished profile of his own interests in science. Stern must have been delighted by his expertise in dealing with psychophysiological experimental studies on the one hand, and his interest in a broader access to both differential and developmental questions on the other. Werner was a full-fledged experimentalist who knew how to run a psychological laboratory, how to teach experimental psychology, and how to participate in contemporary discussions about psychophysics. As a student of both Exner and Külpe, Stern saw in him certainly a person who could represent the segment of academic psychology which had been administered in Breslau by Ebbinghaus and which Stern considered a core aspect of the psychology which had been established by Meumann in Hamburg.

Thus, as Stern welcomed Werner at the Dammtor Bahnhof on Friday, September 21, 1917, he was full of hope that his new assistant could, at least in the long run, help continue, deepen, and renovate basic research in Meumann's laboratory and at the same time help develop new creative approaches in the growing field of experimental psychology. For Stern, Werner seemed to be an ideal person to put together a new staff. One reason was that Werner was one of the few who had worked both in Vienna and Munich with instruments and techniques created by Meumann. So he seemed privileged to competently continue research in Meumann's work.

Another reason for Stern's optimism was that Stern had always regarded himself as a scientist who felt, at least in part, committed to strict experimental psychophysical research. This is clear in his habilitation thesis, *Psychology of the Perception of Change* (1898), and also in his methodological commentaries in his classic book *Differential Psychology in Its Methodological Foundations* (1911). However, during the years in Breslau, he had somewhat reduced this area in his own work, perhaps because Ebbinghaus had been representing this segment of psychology there. Now, as the new director of the Psychological Institute, Stern needed a person who was fully competent in experimental psychophysical research. According to the large variety of topics addressed in Werner's experimental studies, Stern might have seen in his new assistant one of those young and promising scientists who was able to extend the ground of experimental psychology beyond the classical areas of psychophysics, into the more complex terrain of logic, thinking, language, and even personality.

SIGMUND EXNER, THE ENVIRONMENT OF VIENNA, AND WERNER'S EXPERIMENTAL ORIENTATION

Werner, who originally intended to become an engineer, recognized after a few years at the Vienna Institute of Technology that this was not his real vocation. So in 1909, he changed to musical science at the Vienna University, studying mainly the history of music. During this time, three different strains of thinking were present: Darwinism and evolution theory, neo-Kantianism, and positivism/empiricism. Generally, one could perhaps speculate that Werner went through similar doubts and divergent schools of thinking, as had been the case with William Stern during

his time at the Berlin University, where he found himself jammed between two divergent schools of thinking in psychology, the school of Dilthey and that of Ebbinghaus—the first favoring an understanding-hermeneutic approach, the second preferring the experimental-elementaristic paradigm for analyzing psychological phenomena. Stern's intention was to reconcile these two controversial ideologies in the still young science of psychology. Although his background was quite different, Werner seemed to fit very well into what Stern thought could be a new school of psychological research integrating both experimental and humanistic-understanding studies.

When Heinz Werner had successfully finished his dissertation entitled *About the Psychology of Aesthetic Joy*, at the University of Vienna in 1914, he had already published a considerable number of studies. From 1914 to 1915, he went for a post-doctoral year to Exner's laboratory in Vienna. He was called for a short time to military service in 1915, and after this went on to Munich in order to accomplish some experiments under the guidance of Külpe. This move seems to be have been, for several reasons, of great importance for Werner's further development: First, with his move from Vienna to Munich, Werner left the pure psychophysiological area, which was associated with the studies by Exner (e.g., Exner, 1873, 1875b). Furthermore, Werner tried to provide a dignified theoretical and experimental foundation to his earlier attempts to conduct classical psychophysical research in areas beyond the narrow boundaries of relatively simple physiological phenomena. His original mentor Sigmund Exner had already made major progress in research on physiological and psychological phenomena (Exner, 1875a): Exner's well-known "spiral" anticipated, in a way, later concepts of stroboscopic vision and the perception of movement, formulated by Wertheimer (1912, 1923), Koffka (1922), and Köhler, (1929). These founders of Gestalt psychology later referred in their studies to the work of Sigmund Exner: "Movements are qualities of their own, not reducible to elements."

Werner continued these lines of exemplifying this gestalt-like conception of perception in his earlier research, trying to integrate sensory and gestalt psychology in his publications. These focus on two larger topics: optical phenomena and microprocesses in the genesis of concepts. Starting with the concepts of psychophysics, from the beginning Werner seemed to expand the physiological view beyond materialistic, elementary thinking. Well guided by his teacher, Sigmund Exner, Werner knew very well the intricacies of physiological measuring and about the difficulties of interpreting sensory phenomena outside the narrow physiological-neurological area.

EXPANDING PSYCHOPHYSICS INTO NEW CONTENT AREAS

In his "studies on the blind spot" (1913a), which had brought him a prize (Trebitsch prize), and in his study "on a phenomenon of optical fusion" (1913b), Werner focused on phenomena associated with optical perceptions that were not

explainable by physiological measures alone. Disappearing objects in the blind spot area, as well as a kind of three-dimensional vision, were interpreted by introducing the concept of an active perceiver. Moreover, his early research on the logic of concepts (1912a, 1912b, 1915) exemplifies his deep involvement in association psychology and language as well as, put in modern terms, in the psychology of the mind. Here, one can see a preliminary approach to his later preoccupation with concepts like physiognomics of language, expressing also his great interest in both cross-cultural and developmental issues. Thus, it seems as if Werner's later interest profile had already been formed and can be found in these early articles.

Aside from being an expert in psychophysiology, Werner had also studied musicology. Thus, we often find in his investigations a two-pronged approach to psychological phenomena: Psychophysics on the one hand, and esthetics and creativity on the other. Moreover, Werner also began to study children's development of differentiation of basic movements, such as turning to something or turning away from something, i.e., paying attention to or losing interest in something. Here, Werner started from classical psychophysiological problems of his time, but broadened the view on them by expanding the methodology to new and meaningful units representing the real psychological life of human beings, such as the fundamental emotional dimension of pleasure and reluctance (*A Psychophysiological Theory of Practice*, 1913c). Another example of Werner's attempts to grasp the essence of such complex processes as creativity are manifest in his publication *On Artistic-Individual Processes* from 1913(d), where he speculated on the development of ingenious thinking and divided the entire process into three segments, a pre-ingenious, an ingenious, and a post-ingenious process.

This expansion of psychophysics to human-specific phenomena, so typical for Werner's later work, seems to be present already in his *Outline for a Table of Concepts on Developmental Basis*, published in 1912(a). By "development of concepts," Werner means the process of abstraction by which prototypical memory-based, affective-cognitive units are formatted. In this approach, Werner distinguishes between perceptual and emotional concepts. Perceptual concepts are further subdivided into static and dynamic perceptions. Interestingly, dynamic perceptions are characterized by their focus on movements, and here Werner demands an active subject. For example, the concept 'ball' can be conceived of by three different modes: first, by a static concept as an object of spherical form and a certain material; second, by describing the action which can be conducted with this object, e.g. throw the ball up in the air; and third, by focusing on its movements, as children often imitate the jumping ball in its movements. This kind of analysis for existing concepts of objects can perhaps be taken as his starting point for cross-cultural comparisons, e.g. German and French concepts for the same objects such as *porte-feuille* and *Brieftasche* (wallet), indicating a concept focusing on dynamic action (carry leaf!) as in French, or characterizing a static concept which is just linking two objects (letter and bag) as in German. Werner concludes that this difference across cultures may well be manifest in more general patterns representing a culture-specific format of thinking and explaining the world. By the same token, Werner argues,

it could be very worthwhile to analyze children's use of words and concepts, in order to learn more about continuities and discontinuities in the process of forming concepts.

Thus, already in 1912, we find in a tiny study what later became so typical in Werner's thinking: The intention to shed light on the nature of an abstraction of a piece of reality found in one cultural context and to compare it with the kind of abstraction of the same piece of reality in other cultures. Furthermore, to open an avenue for better understanding of development in children, Werner began to embed this process of higher order abstraction into the evolution of culture-specific models for conceptions representing similar segments of reality.

In a similar vein, Werner, in his ***Begriffspsychologische Untersuchungen*** [*Studies on The Psychology of Concepts*] (Werner, 1915), compares the mind of a child when forming concepts of growing complexity with the mind of an adult who is confronted with a foreign culture and realizes for the first time that so far he or she had always taken things that are different for identical. The new differential knowledge enables the person in the foreign culture to form a higher-order concept which can localize the specifics of the difference. That is, the process of forming general concepts or categories can be studied in children as well as in different cultures. We find this approach further elaborated in Werner's *Comparative Psychology of Mental Development*, which is based on his German version of *Introduction to Developmental Psychology* (1926).

WHAT WERNER LEARNED IN MUNICH

In his Munich years, from the end of 1915 to fall 1917, Werner intensified his interests in experiments focusing on the analysis of concept formation in all the various areas of sensory input. Using Külpe's laboratory (which was directed by Bühler), he proceeded to conduct increasingly sophisticated experiments centering on the analysis of microprocesses. On one side, he continued his own expansions of psychophysiology. On another—influenced by Külpe and Bühler—he intensified his attempts to broaden his theoretical view by applying a gestalt-oriented approach for studying complex mental processes. This direction entailed a developmental approach—look art how 3–5 year olds begin to create melodies (Werner, 1917).

In his article *On Optical Rhythmics*, published 1918 when Werner was already in Hamburg, Werner tested subjects' tendencies to organize a series of incoming tactile, optical, and acoustical stimuli by giving them certain rhythmic structures. The new aspect was to show that even optical stimuli were rhythmically organized. Furthermore, Werner was also interested in showing mutual influences of different perception modes such as acoustic and optic stimulation. The notion of gestalt and entity began to play a major role in his thinking. Although the research design can be described as representing all typical essentials of contemporary psychology of the senses, Werner strongly followed a non-reductionistic and even humanistic approach, with active subjects organizing incoming stimulations (1919a). Werner's

main interests focused on the manipulation of reproductive processes. Aside from questions concerning general intersensory influences such as which sense organ was producing the greatest amount of interference in multiple input situations, acoustical stimulation, Werner elaborated on differential rhythm creations in his subjects, depending on their specific attitudes.

In a way, Werner created a new concept of activity when organizing a series of percepts, which he called the "phrasing of rhythms," which led to a "gestalt" in a series of stimuli. Furthermore, his experiments revealed interesting differential results: In an experiment in which he wanted to investigate the rhythmization of optical stimuli in subjects, he found that his subjects differed strongly according to the kind of rhythm they were construing by focusing either on the series of flashes or on the dark phases between them (Werner, 1918).

WERNER'S METHODOLOGY—COMPARED WITH MEUMANN, EBBINGHAUS, AND STERN

One of the reasons why Werner was attracted to the work of Külpe in Munich was this scientist's affinity to both humanities and natural science. Külpe, a student of Wilhelm Wundt and Georg E. Müller, was a person who had studied history at the same time he was becoming an experimenter. He was open to efforts to extend experimental methods to complex phenomena, like the formation of associations and directed thinking, an area which both Wundt and Müller had rejected as proper fields for scientific research. This affinity for expanding a more or less physiological and mechanical-technical scientific approach to a field where research should be oriented toward a more holistic and organismic world view was something Werner already shared with other two scientists highly relevant to him: Exner and Külpe. Feeling strong obligations to music and the fine arts, Werner found open doors for these orientations when he came to Hamburg.

The Legacy of Ernst Meumann

Perhaps one should consider in some more detail the backgrounds of both the "genius loci" in Hamburg, Ernst Meumann, and one of the significant teachers of Stern, Hermann Ebbinghaus. Both men were scientists who moved softly between natural sciences and humanities. Both were aligned to experimental methodology, but both also had a wider concept of the field of psychological phenomena than Wundt and Müller. Ebbinghaus, the mentor of Stern, had extended exact methodology to the study of memory and learning. A former teacher himself (for some time he was the personal teacher of the German Prince Waldemar of Prussia, who died 1878), Ebbinghaus was fascinated by the new experimental methodology. Meumann—also a student of Wundt—had extended experimental methodology to study learning in a scientific manner in Zurich, Switzerland, in Königsberg

in East Prussia, and in Münster in Westfalia—places where he held academic positions.

Originally motivated to become a priest, Meumann had, after his years with Wundt in Leipzig, turned into an engaged scientist who wanted to gain new insights into processes which were accompanied by learning: memorizing, perception, attention, presentation of stimuli, etc. When he was finally offered a position at the Institute for Colonial Studies in Hamburg, he became an engaged teacher of elementary school teachers, founded a new Institute for the Study of Adolescence, and established a highly technical psychological laboratory at the newly founded psychological Institute. In his *Introductory Lectures into Experimental Education* (Meumann, 1911, 1913), he relied on the many experimental studies he had developed with revolutionary measurement instruments.

Thus, when Stern accepted the professorship in Hamburg as the new director of this Psychological Institute, he felt more than just an obligation to continue the work of his predecessor. He wanted to follow Meumann in his intention to teach, but he also wanted to continue the experimental tradition he was committed to since he had followed Ebbinghaus to Breslau and which he saw well established in Meumann's lab. Furthermore, Stern had an additional obligation to extend his activities beyond academic psychology: It had been the Teachers' Association in Hamburg that had unanimously voted for Stern during the discussion concerning the succession of Meumann. It was clear that teachers in Hamburg expected practical advice from Stern on how to optimize their professional activities in teaching children.

Heinz Werner Work Tasks in Hamburg

Werner's job, first of all, was to continue all the nonmilitary work in the Meumann's laboratory, since this had been the task of Kehr, whom Werner had been hired to replace. Stern was highly engaged in the Hamburg teacher education and, associated with this involvement, he had strong interests in intensifying the necessary school reform in Germany. During his first years, between fall 1917 and 1919, Werner worked in an Institute which was in a state of transition, as was most everything at the end of the First World War. At that time, Stern invested much of his energy to convince the Hamburg administration to transform the Colonial Institute into a full-fledged university. Werner, as Stern's assistant, helped to realize this idea and to offer basic education for teachers. However, at that time, the future in general appeared to be insecure and the living conditions were very difficult. According to letters he wrote to his friend Jonas Cohn (letter from Stern to Cohn 01/22/18 and 02/20/18, in Lück & Löwisch, 1994, p. 111–112), Stern himself was deeply involved in practical tasks, like the selection of 1,000 female streetcar drivers to run the public traffic system during the war, and he had to direct war-relevant research on attention and perception processes. Werner was highly occupied in these mostly technical research tasks, but he also wrote papers in which he analyzed data

from experiments which he had conducted in Munich (Werner, 1918). Furthermore, during this first period in Hamburg, Werner married a woman, Jo Gervai, who was deeply devoted to the arts.

After the end of the war, Stern was intensely politically active and organized meetings to defend freedom of teaching (letter from Stern to Cohn 11/15/918, in Lück & Löwisch, 1994, p. 116–117). He and Werner were busy organizing lectures for the many soldiers coming home. On January 6, 1919, the former Hamburg Colonial Institute became a private university and, by Easter 1919, the Psychological Institute became an Institute as part of the new University. Stern described in some detail the concrete shaping of the new Institute in his first annual report in 1922: The Institute was partitioned in three departments: (1) General Psychology, (2) Applied and Organizational Psychology, and (3) Educational Psychology and Science of Adolescence. Stern rejected a separation between psychology and philosophy in his Institute, since this had been established already in many other universities, both in Germany and in the U.S. He saw this as a tragedy that should in no case been replicated in the new University. On the contrary, Stern worked hard to attract the famous philosopher Ernst Cassirer to the new institution, succeeding in 1919.

With the time, especially after 1921, the Hamburg Institute became a very interesting and well-known place attracting other scientists as well. Until 1933, it seems that Stern and Cassirer were in a permanent discussion. Of course, Heinz Werner was also strongly influenced by this neo-Kantian philosopher (Cassirer, 1923, 1925, 1929) who brought the relationship between evolution and culture into focus, a topic which more and more emerged in Werner's publications (e.g. Werner, 1926).

In this report from 1922 describing the history of the young university, Heinz Werner summarizes his own activities at the Institute on pages 11–15. They show a broad scale of topics, such as the problem of the genesis of gestalts, critical reflections about experimental procedures which are applied, for example, to measure opinions, and discussions concerning basic questions about the psychology of intensity. Moreover, Werner reports experiments dealing with phenomena of vision, tactile perception, rhythm in perception, and laws of the formation of language. This short summary depicts the richness of Werner's many activities during his first year as a *Privatdozent*—which he became after his habilitation in 1920—still with a strong psychophysical orientation (e.g. Werner, 1922, 1924b). But this period also brought Werner a deeper involvement in language and the fine arts. His *Origins of the Metaphor,* which he published in 1919(b) and was the basis for his habilitation.

After he became a *Privatdozent* at the new University, he obviously taught much. In 1923, the dean of the philosophical faculty had to answer a query of the administration with regard to Werner's high number of lectures—eight weekly hours, a number much too high for a *Privatdozent.* Of course, it was the administration's decision to pay only three weekly hours, not more. But the dean intervened and protected Werner's teaching enthusiasm at that time. In 1926, finally, Heinz Werner was appointed professor and vice director of the Institute.

Werner's Search for General Laws of Structure

Between 1921 and 1927, Werner more and more shifted his topic of interest. From his focus on *Sinnespsychologie*, that is, the psychology of the senses, he vigorously started to design increasingly sophisticated experiments in order to gain stronger arguments for the importance of the "inner dynamics," describing the active processing of incoming information from the various sense organs. He began to discuss the concept of a "vivid process of forming gestalts" (Werner, 1927, p. 164) after reading protocols of his subjects. Werner's publications during this period exhibit very clearly a permanent move in his thinking. The notion of structure, or "gestalt," became more and more salient. Of course, elements of this holistic conceptualization of information processing were already present in earlier publications, but as indicated by the caption for a series of articles—"studies on the laws of structure" [*Studien über Strukturgesetze*]—Werner now intensely focused his experimental work on the microgenesis of structures and gestalts (1925).

The time between 1921 and 1927 may be called the "golden" time in Werner's scientific career. This is also the time when discussions went on between Cassirer and Stern on how the individual is born to become a personality by actively internalizing and working on what is given by culture. From 1926 on, the theoretical biologist Johann Jakob von Uexküll (Uexkyll, 1909, 1920) participated in these discussions.

The search for general "laws of structure" became more and more manifest in Werner's publications during the following years. The core of them appeared in the *Zeitschrift für Psychologie* between 1924 and 1927 and were labeled as products of the Hamburg Psychological Laboratory. Aside from these articles covering various aspects of sensory integration and dynamics of perception, Werner wrote his famous *Introduction to Developmental Psychology*, which appeared in 1926. Here, he emphasized comparative investigations as being a prerequisite for understanding developmental processes in general. Moreover, he turned to areas which had always attracted him and which he must have seen as a genuine field in his thinking: pathology, non-Western cultures, and the arts. An example of his growing interest in pathological forms of perception is seen in his systematic comparisons in *Introduction to Developmental Psychology*, where he describes formats of thinking in non-Western, "primitive" cultures, then analyzes children's processes of cognitive development, and, finally, illustrates formats of thinking processes in patients with cerebral damage (Werner, 1926). Moreover, he illuminates different layers of sensory inputs in a clinical case in which a subject cannot perceive movements generated by a stroboscope (Werner & Creuzer, 1927). By the same token, when he turns to consider processes which lead to the production of language and art—a topic which was already present in his very early publications (Werner, 1913d)—he published some articles on aesthetics, such as the origin of lyric poetry (Werner, 1924a) or on the structure of words (Werner & Lagercrantz, 1924).

The various "Studies on the Laws of Structure," published as a series over the years, do convey a somewhat paradoxical message. On the one hand, these publications still convey that the main topic is sensory psychology but, at the same time, they lead the reader into areas far away from basic psychophysics. The investigations center on comparisons of perceptual phenomena across different cultures and languages, and they amply contain speculations about the process of creating structure and gestalt. For example, in the study about laws of structure and their effects on so-called geometrical-optical deceptions (1924b), Werner distinguishes between homogenuous and inhomogenuous, centered and uncentered, and diffuse and ordered structures. He offers a kind of topology for classifying expressive forms. Interestingly, Werner adds to this description of antagonism the sentence: "... without including a developmental perspective" (1924b, p. 248). This addition suggests that Werner was very aware of the fact that he was approaching the aspect of forming gestalts in perception only on a typological level, neglecting the dynamic developmental component. However, Werner explicitly demands the inclusion of the dynamic dimension to grasp the genesis of these structures, to understand how they are created.

For Werner, each Gestalt is the vivid expression of an individual's forming process. Werner goes one step further: He looks for recurring patterns in this forming process, and detects in each gestalt the tendency to represent something like the intended nature of the structure, or, in other words, a trend to underline the *essence* of the perceived figure. He introduces the concept of "assimilation" and "dissimilation" for describing two diverging formatting processes. The process of assimilation is typical for the undifferentiated and homogenuous perception of a formation representing the essentials of the form in all its different parts. The process of dissimilation characterizes differentiated perception: the parts of the specific form are contrasted and therefore represented in dissimilar forms. In this process, one can also uncover specifics of those dynamics which might be inherent in development and which later were elaborated on as the "orthogenetic principle" (Werner, 1957; see also Kaplan, Bhatia & Josephs, this volume).

Still in 1924, Werner further illuminates his approach of analyzing microgenetic processes in gestalt formation in the area of motor functioning. In his study "On the Problem of Motor Shaping" (Werner, 1924c), he focuses on the process of drawing with closed eye, and illustrates that phenomena like dissimilation or assimilation, known from the gestalt-formation in perception, can even be found when individuals actively try to master the task of drawing. Moreover, as in the process associated with the perception of diffuse and differentiated gestalts, he conceptualizes two different processes accompanying the motoric formation, either a diffuse homogeneous formation or an elaborated and inhomogeneous structure. Again, Werner demonstrates that the law of differentiation is effective to form gestalts. Here, he widens his theoretical concept of gestalt formation considerably by claiming the existence of "rhythm" in the formation process, structuring a regular series of acoustical or optical stimuli.

Another example of how Werner tried to widen the field of experimental research into complex areas is his study of the structure of words. (1924, together with Lagercrantz). Modern experimental instruments like the *kymographion* (a kind of polygraph) are applied for registering the stream of sounds produced by the larynx. Subjects had to articulate meaningless word-like sounds and syllables (within the frame of German language sound), and the aim of the study was to find differences in the quality of formation according to variations in subjects' articulation. Differentiated accentuation or diffuse production of sound without articulation were interpreted within the general framework of the two processes of assimilation or dissimilation, or differentiation or diffusion. In this study, Werner tried to find out whether the *process* of producing a form would be influential for the final quality of the produced form or gestalt. New questions were asked with regard to a possible reversal of this process: Would it be possible to reconstruct the intention of the producer from the final quality of a gestalt, that is, the cultural meaning in words? Werner asks for the reason of the tendency for differentiation so clearly present in languages, and discusses the relationship between assimilation and dissimilation during the period of language acquisition, a highly relevant issue during concept formation in children.

Another series of experiments (Werner, 1927) focuses on the process of music production. Werner's favorite experimental instrument in this context was the sound variator constructed by William Stern when working on problems of perceptual changes (Stern, 1898). Werner proposed three basic laws describing the production of harmony in microprocesses: First, the law of increasing determination; second, the law of increasing structuredness; and third, the law of increasing constancy of sounds. These three laws rely on the developmental passage which starts in the state of non-structuredness and leads, according to Werner, to increasing structuredness. Sounds and intervals are integrated and begin to form a relational system where sounds and intervals merge to a melody. Werner suggests that this process produces increasing sharpness of differences and that it represents another example for the genesis of gestalts.

Thus, when Werner finally wrote up his *Introduction to Developmental Psychology*, which appeared in 1926, the impact of his manifold studies centering on psychophysical issues created a new concept for understanding developmental processes. In this book, a kind of summary approach, he linked together comparative, psychopathological, creative, and developmental aspects in order to develop new insights about commonalities and differences in processes, which are considered to cover quite different areas of human behavior. Uncovering these microprocesses helped to better understand actual modes of perceiving and structuring. But at the same time, these analyses were considered to be essential for explaining the development of cultural products like language and other expressions such as melodies, paintings and sculptures. By intertwining cultural and human development and by linking children's mode of thinking with "primitive thought," i.e., world views in non-Western and nonrational cultures, Werner set new margins for thinking about individual and culture development.

WERNER'S FINAL TIME IN HAMBURG: 1927–1933

In 1926, Werner had been appointed Professor and Deputy Director of the Psychological Institute. He felt well settled as a person with a distinct scientific interest profile at an Institute which had become a hub for excellent experimental research, ecological studies (Muchow, 1926), and ample theoretical discussions. During this period, Werner deepened what he had already touched on in earlier studies: his process-analytical approach for analyzing both integrative and differential sensory experiences in subjects. He intensified studies where he tried to analyze the integration process of different sensory area, and he went on to do tentative research in a new and widely unknown field that didn't exist during this time and can be characterized, under today's perspective, as "develomental psychopathology" (Sroufe & Rutter, 1984; Rutter & Sroufe, 2000). The study of perception and concept formation processes in persons who were "deviant" with regard to "average" or "normative" processes became more and more interesting (Werner & Creuzer, 1927). Moreover, Werner turned to the analysis of varying formats of cultural expressions, such as melodies, paintings, or language (Werner, 1928, 1931, 1932). Thus, both clinical studies, as well as intercultural and comparative approaches, brought new insights and were used as material for illustrating common roots in the very general developmental laws that he began to formulate.

During this late period in Hamburg, Werner began to integrate both intercultural and aesthetic form-discussions and focused on still another topic in psychology which was already, though to a lesser degree, present in many of his earlier investigations: The role of emotion in perception. This issue was very much neglected at the time Werner tried to bring it up as a major developmental theme. In newer infant studies, however, this topic plays a major role (Saarni, Mumme, & Campos, 1998; Sroufe 1996).

Moving to even higher levels of abstraction, Werner seemed eager to formulate universal laws for cultural structures in general, and for the impact of cultural context on the process of individual development in particular. The "principle of constellation" and the "principle of transposition" represent two attempts to argue against a simplistic stimulus-reaction concept (Werner, 1929). The emergence of a context-oriented and culture-specific thinking in Werner's later publications, between 1927 and 1932, can perhaps be linked to the growing influence of Ernst Cassirer. Moreover, a new kind of radical holistic argumentation is found. Outside the isolated lab, Werner begins to communicate that he sees in real life the perpetual connectedness of all senses in human experience (Werner, 1929). The permanent oscillation between the differentiation and the unity of senses—observable, for example, in subjects when they are studied outside the lab in highly loaded emotional situations—is interpreted as a relevant developmental issue. In infants, according to Werner, sensory impressions are bound sometimes to only one specific domain of objects, such as colored blocks or a musical instrument, to produce according domain-specific experiences. Sometimes, however, the kind of singular or holistic impression formation may depend on the level of subjects' state of consciousness.

In young children's undifferentiated experiences, both these modes of impression formation, either isolated or integrated, can be found. Here, Werner seems to anticipate what Spitz (1965) later called the difference between coinesthetic (holistic) or diacritical (isolated) perception. In his article (1929) on the problem of feeling and the problem of testing it experimentally, Werner takes up an idea of Max Verworn (1907, 1912) about "romantic psychology," that is, a psychology which tends to understand how one person's experience can become related with the experiences of other persons in the same context. As such, he claims a kind of common and unitarian understanding of nature. Werner follows Herder (1772/1978, 1784–1791/1978) when he writes about the process of dismembering of sensations as an abstraction where the philosopher has to leave a thread of sensation or feeling which may follow another thread. However, only the entity of all single threads do produce a specific format of a complex texture responsible for a child's or a grown person's unique impression. Aside from being impressed by the thinking of Cassirer, Werner strongly seems to follow William Stern's concept of the person as a *unitas multiplex*, the person as a unit with a multitude of possiblities for performance, embedded in a living cultural context (Stern, 1935).

Despite the fact that during the 1920s, the Hamburg Institute gained a high degree of prestige and acknowledgement, psychology came under heavy critique during the early 1930s, long before the Nazis came to power. Times were economically very hard or even catastrophic in Germany during 1929 and 1930. All public budgets were sharply cut, and the Hamburg University was no exception. Moreover, many politicians seemed to have a particular reason to cut down the resources for the Psychological Institute: They believed at that time that psychology in general had played too strong a role in the public discussion during the '20s and that it was now time to take the opportunity to correct this. Once again, psychology as a science needed more public attention and justification. Werner increased his public radius by writing articles in newspapers against false "experts". In the *Hamburger Fremdenblatt*, he argued against a Ukrainian physician who claimed to be able to analyze a person's character by systematic electrical stimulation of the skull (see also van der Veer, this volume). Furthermore, he wrote an article in the renowned, very popular and widely read *Berliner Illustrierte Zeitung*, where he discussed the new possibilities to generate "mental deviances" experimentally, for example, by using drugs such as opium, cocaine, and mescaline. He illuminated the new opportunities to close the gap in the understanding of a continuity between psychiatric illnesses and normality. So he tried to keep psychology alive as a meaningful and promising young science.

WERNER'S FINAL YEAR IN HAMBURG

In 1933, things went wrong. Outside the Institute, the Nazis gained power on January 30, and began their cleansing of all public administrations. With their *Gesetz zur Wiederherstellung des Berufsbeamtentums* ("law for the reconstitution of the civil

servants"); they banned all political opponents, pacifists, and Jews from public servant positions. This meant a dramatic wave of dismissals in all public institutions, mostly without further financial help. Whereas William Stern was dismissed with a pension, Werner was banned from the Institute without further payment by end of July (exact date of dismissal is July 25, according to a letter of Werner's lawyer in the 1950s claiming compensation from Germany). This was what happened outside the Institute. Inside the Institute, things were not better. Some Nazi assistants (Roloff, Krueger, and Bonte) went openly against Stern, Werner, Muchow, and all the other non-fascist members of the staff with a letter from July 10 (Staatsarchiv Hamburg, 1933) to the head of the administration for schools and universities in Hamburg, containing very defamatory statements about Stern, Werner, and many others in the Hamburg Institute.

Between March and the end of July, a series of "emergency PhD exams" were held in Stern's apartment with Werner who, like Stern, still kept working hard and helped students to finish their doctoral dissertations in order to equip them with some academic degree, at least, in these catastrophic times (according to Moser, 1986, p. 21). After July, most members of the old staff left Germany, including Werner. Stern stayed longer in Hamburg. In a letter to Cohn, dated December 19, 1933, Stern wrote about the opportunities for colleagues and friends to get jobs abroad:

> Cassirer is in Oxford (where he even begins to lecture in English), Katz in Manchester, Wertheimer, Lewin, Werner in America. I am very glad particularly for Werner, because he stood there without any means, impoverished. He had not had a tenure position at the University. There came Pillsbury and offered him a position as lecturer at Ann Arbor. (in Lück & Löwisch, 1994, p. 170)

WHAT COULD WERNER BRING TO AMERICA?

In this review of Werner's scientific development during the Hamburg years, I have emphasized three aspects which might help to characterize his basic orientation when he came to America. First, he was an expert in experimental methodology; second, he was deeply oriented towards a comparative approach for the analysis of developmental processes; and third, he was eager to formulate universal laws for developmental processes, covering both microgenetic and macrogenetic aspects in individuals as well as in cultures.

One could perhaps argue that all these components were present in Werner's thinking before he arrived in Hamburg. However, even when they were there in a nascent stage, the time in Hamburg was needed to bring them out clearly. His integration in the general creative climate of a living Institute devoted to promoting the new science of psychology on the one hand and open for interdisciplinary discussions on the other, contributed to his unique profile of research. The experience of the cooperation with Stern, Cassirer, von Uexküll, Katz, Muchow, and all the many

others may have pushed him to broaden his view into the secrets of the cultural formation of perceptions and into the surprises of intercultural comparisons.

REFERENCES

Cassirer, E. (1923–1929). *Philosophie der symbolischen Formen.* Vol I–III [Philosophy of symbolic forms]. Vol. I (1923) Die Sprache [Language], Vol II (1925) Das mythische Denken [Mythical thinking], Vol III (1929) Phänomenologie der Erkenntnis [Phenomenology of knowledge]. Berlin: Bruno Cassirer Verlag.

Exner, S. (1873). Experimentelle Untersuchungen der einfachsten psychischen Prozesse [Experimental studies of the most simple psychological processes]. *Archiv für die gesamte Physiologie, 7,* 601–660.

Exner, S. (1875a). Über das Sehen von Bewegung und die Theorie des zusammengesetzten Auges [On the perception of motion and the theory of the assembled eye]. *Sitzungsbericht der Akademie der Wissenschaften Wien (Math-nat. Kl. Abt. 3), 72,* 156–190.

Exner, S. (1875b). Experimentelle Untersuchungen der einfachsten psychischen Prozesse III. Abhandlung: Der persönlichen Gleichung zweiter Theil [Experimental studies of the most simple psychological processes III. Essay: The personal equation's second part]. *Archiv für die gesamte Physiologie, 11,* 403–432.

Herder, J. G. (1772/1978). Über den Ursprung der Sprache. [On the origin of language]. In R. Otto (Hrsg.), *Werke,* Bd. V. Berlin Aufbau Verlag.

Herder, J. G. (1784–1791/1978). Ideen zur Philosophie der Geschichte der Menschheit [Ideas on the philosophy of the history of mankind]. In R. Otto (Hrsg.) *Werke,* Bd. IV. Berlin: Aufbau Verlag.

Kehr, T. (1916). *Das Bewußtseinsproblem.* [The problem of conscience]. Tübingen: Mohr.

Koffka, K. (1922). Perception: An introduction to the Gestalttheorie. *Psychological Bulletin, 19,* 531–585.

Köhler, W. (1929). *Gestalt Psychology.* New York: Liveright.

Lück, H. E. & Löwisch, D.-J. (1994). *Der Briefwechsel zwischen William Stern und Jonas Cohn* [The correspondence between William Stern and Jonas Cohn]. Frankfurt: Peter Lang Europäischer Verlag der Wissenschaften.

Meumann, E. (1911). *Vorlesungen zur Einführung in die experimentelle Pädagogik und ihre psychologischen Grundlagen.* 1. Band, 2. Aufl. [Lectures introducing into experimental education and their psychological foundations, Vol. 1, 2nd ed.] Leipzig: Engelmann.

Meumann, E. (1913). *Vorlesungen zur Einführung in die experimentelle Pädagogik und ihre psychologischen Grundlagen.* 2. Band, 2. Aufl. [Lectures introducing into experimental education and their psychological foundations, Vol. 2, 2nd ed.] Leipzig: Engelmann.

Moser, H. (1986, April). *Anmerkungen zur Geschichte des Hamburger Psychologischen Instituts bis 1945 oder: Die verlorene Psychologie des William Stern.* [Notes to the history of the Hamburg Psychological Institute until 1945 or: The lost psychology of William Stern]. Manuskript. Psychologisches Institut I, Universität Hamburg.

Muchow, M. (1926). Psychologische Untersuchungen über die Wirkung des Seeklimas auf Schulkinder [Psychological studies on the impact of sea climate on school children]. *Zeitschrift für pädagogische Psychologie, 27,* 18–31.

Rutter, M. & Sroufe, L. A. (2000). Developmental psychopathology: Concepts and challenges. *Development and Psychopathology, 12,* 265–296.

Saarni, C., Mumme, D. L. & Campos, J. J. (1998). Emotional development: Action, communication, and understanding. In W. Damon & N. Eisenberg (Eds.), *Handbook of Child Psychology, Fifth Edition, Vol. 3:* Social, emotional, and personality development (pp. 237–309). New York: Wiley.

Spitz, R. (1965). *The first year of life. A psychoanalytic study of development of object relations.* New York: International Universities Press.

Sroufe, L. A. (1996). *Emotional development. The organization of emotional life in the early years.* New York: Cambridge University Press.

Sroufe, L. A. & Rutter, M. (1984). The domain of developmental psychopathology. *Child Development, 55*, 17–29.

Staatsarchiv Hamburg, (1933). Denunziantenbrief von Roloff, Krüger und Bonte vom 10.7. 1933 an die Hamburger Landesunterrichtsbehörde. Hochschulwesen [Denunciation letter of Roloff, Krüger, and Bonte from 7/10/33 to the Hamburg School Authority]- DPA I 68, Bl. 29/30.

Stern, W. (1898). *Psychologie der Veränderungsauffassung.* [Psychology of the perception of change] Habilitationsschrift, Breslau.

Stern, W. (1907). Grundfragen der Psychogenesis [Basic questions of psychogenesis]. *Zeitschrift für Pädagogische Psychologie, Pathologie und Hygiene, 9*, 77–80.

Stern, W. (1911). *Die differentielle Psychologie in ihren methodischen Grundlagen.* [Differential psychology in its methodological foundations] Leipzig: Barth.

Stern, W. (1914). *Psychologie der frühen Kindheit* [Psychology of early childhood]. Leipzig: Quelle & Meyer.

Stern, W. (1917). *Die Psychologie und der Personalismus* [Psychology of personalism]. Leipzig: Barth.

Stern, W & Stern, C. (1909). Anleitung zur Beobachtung der Sprachentwicklung bei normalen Kindern [Guidline for the observation of language development in normal children]. *Zeitschrift für angewandte Psychologie und Sammelforschung, 2*, 313–337.

Stern, C. & Stern, W. (1907). *Die Kindersprache: Eine psychologische und sprachtheoretische Untersuchung* [Child language: A psychological and linguistic study]. Leipzig: Barth.

Uexküll, von, J. J. (1909). *Umwelt und Innenwelt der Tiere* [Environment and inner world of animals]. Berlin: Springer.

Uexküll, von, J. J. (1920) *Theoretische Biologie* [Theoretical biology]. Berlin: Springer.

Verworn, M. (1907). *Mechanik des Geisteslebens* [Mechanics of mental life]. Leipzig: Teubner.

Verworn, M. (1912). *Die Entwicklung des menschlichen Geistes* [The development of the human mind]. Jena: Fischer.

Werner, H. (1912a). Skizze zu einer Begriffstafel auf genetischer Grundlage [Outline for a table of concepts on developmental bassis]. *Archiv für systematische Philosophie, 18*, 45–62.

Werner, H. (1912b). Ein Beitrag zur Lehre logischer Substitutionen [A contribution to the theory of logic substitutions]. *Archiv für systematische Philosophie, 18*, 431–444.

Werner, H. (1913a). Untersuchungen über den blinden Fleck [Studies on the blind spot]. *Archiv für die gesamte Physiologie, 153*, 475–490.

Werner, H. (1913b). Ein Phänomen optischer Verschmelzung [A phenomenon of optical fusion]. *Zeitschrift für Psychologie, 66*, 263–270.

Werner, H. (1913c). Eine psychophysiologische Theorie der Übung [A psychophysiological theory of practice]. *Vierteljahrsschrift für wissenschaftliche Philosophie und Soziologie, 39*, 417–441.

Werner, H. (1913d). Über die künstlerisch-individuellen Prozesse [On artistic-individual processes]. *Archiv für systematische Philosophie, 19*, 429–441.

Werner, H. (1915). Begriffspsychologische Untersuchungen [Studies on the psychology of concepts]. *Archiv für systematische Philosophie, 21*, 162–172.

Werner, H. (1917). *Die melodische Erfindung im frühen Kindesalter. Eine entwicklungs-psychologische Untersuchung* [The melodic invention in early childhood: A development-psychological study]. Wien: A. Hölder.

Werner, H. (1918). Über optische Rhythmik [On optical rhythmics]. *Archiv für die gesamte Psychologie, 38*, 115–161.

Werner, H. (1919a). Ordnen von Begriffsreihen [Organization of concept series]. *Zeitschrift für angewandte Psychologie, 81*, Beiheft 18.

Werner, H. (1919b). *Die Ursprünge der Metapher* [The origins of the metaphor]. München: Barth.

Werner, H. (1922). Grundfragen der Intensitätspsychologie Basic questions of intensity psychology]. *Zeitschrift für Psychologie, 89* , Ergänzungsband 10.

Werner, H. (1924a). *Die Ursprünge der Lyrik* [On the origins of lyric poetry]. München: Ernst Reinhardt.

Werner, H. (1924b). Über Strukturgesetze und deren Auswirkung in den sogenannten geometrisch-optischen Täuschungen [On the laws of structure and their impact in so-called geometrical-optical deceptions]. *Zeitschrift für Psychologie, 94*, 248–264.

Werner, H. (1924c). Über das Problem der motorischen Gestaltung [On the problem of motoric shaping]. *Zeitschrift für Psychologie, 94*, 265–272.

Werner, H. (1925). Über Mikromelodik und Mikroharmonik [On micromelodics and microhamony]. *Zeitschrift für Psychologie, 98*, 74–89.

Werner, H. (1926). *Einführung in die Entwicklungspsychologie* [Introduction to developmental psychology]. Leipzig: Barth.

Werner, H. (1927). Über die Ausprägung von Tongestalten [On the markedness of sound gestalts]. *Zeitschrift für Psychologie, 101*, 159–181.

Werner, H. (1928). Über die Sprachphysiognomik als einer neuen Methode der vergleichenden Sprachbetrachtung [On the physiognomics of language as a new method for comparative language studies]. *Zeitschrift für Psychologie, 109*, 337–363.

Werner, H. (1929). Das Problem des Empfindens und die Methode seiner experimentellen Prüfung [The problem of sensation and the method of its experimental testing]. *Zeitschrift für Psychologie, 114*, 152–166.

Werner, H. (1931). Raum und Zeit in den Urformen der Künste [Space and time in the prototypes of the arts]. In H. Noack (Hrsg.), *Vierter Kongreß für Ästhetik und allgemeine Kunstwissenschaft* (Beilageheft zur Zeitschrift für Ästhetik und allgemeine Kunstwissenschaft, 25, pp. 68–86). Stuttgart, Enke Verlag.

Werner, H. (1932). *Grundfragen der Sprachphysiognomik* [Basic questions of the physiognomics of language] . Leipzig: J. A. Barth

Werner, H. (1957). The concept of development from a comparative and organismic point of view. In D. B. Harris (Ed.), *The concept of development* (pp. 125–148). Minneapolis: University of Minnesota Press.

Werner, H. & Creuzer, H. (1927). Über einen Fall von "Schichtspaltung" beim Bewegungssehen [A casestudy on "mental split" during the perception of motion]. *Zeitschrift für Psychologie, 102*, 333–337.

Werner, H. & Lagercrantz, E. (1924). Experimentell-psychologische Studien über die Struktur des Wortes [Experimental-psychological studies on the structure of the word]. *Zeitschrift für Psychologie, 95*, 316–363.

Wertheimer, M. (1912). Experimentelle Studien über das Sehen von Bewegung [Experimental studies on the perception of motion]. *Zeitschrift für Psychologie, 61*, 161–265.

Wertheimer, M. (1923). Untersuchungen zur Lehre von der Gestalt II [Studies on the theory of gestalt II]. *Psychologische Forschung, 4*, 301–350.

3

THE MAKING OF A DEVELOPMENTAL PSYCHOLOGIST

René van der Veer

In this chapter I will present an analysis of Heinz Werner's (1890–1964) work by concentrating on his developmental views. I will argue that Werner's view of development has its roots in theories dating back to the 19th or even the 18th century and is based on assumptions that are now viewed as questionable. Interesting as Werner's theory may be, it is in need of criticism and cannot be seen as the final word in our thinking about development. It is in rethinking the developmental ideas of predecessors such as Krueger, Werner, Koffka, Bühler, Piaget, and Vygotsky that we may hope to advance some steps forward in our understanding of the concept of development.

That I concentrate on Werner's developmental views does not mean I view Werner as exclusively a developmental psychologist or a child psychologist. Throughout this book, it becomes clear that Werner was much more than that. Through his wide reading and excellent contacts, through his boundless curiosity and omnivorous interests, Heinz Werner was able to acquire a vast knowledge of the sciences of his time. Werner's knowledge went far beyond a narrowly defined psychological domain, and he could write with equal authority on the blind spot and on the creative process, on musical history and on the psychology of intensity (Werner, 1913a; 1913b; 1922). That he ended up being called a developmental psychologist—just like such other hybrid figures as Piaget and Vygotsky—just demonstrates our inability to cope with scholars who transcend the ordinary boundaries and our preference for facile labels. Such labels can be only partially justified if we understand the term "development" in the very broad sense outlined below.

WERNER'S CONCEPT OF DEVELOPMENT

Werner's conception of development was undoubtedly influenced by the thinking of his contemporaries (see, for example, the chapters 1 and 2 in this book). However, in this chapter, I will argue that part of his thinking was based on the reading of much older literature. Werner's tremendous knowledge of the field of ethnography, for instance, was largely based on the reading of books and articles that dated from the 19th century. And several of the basic principles of his developmental approach had their roots in—or were, at any rate, preceded by—the still earlier thinking of Goethe (1749–1832), Herder (1744–1803), and Hegel (1770–1831).

Werner himself (e.g., 1924c, 1926c, 1930a, 1932) was quite clear about this 18th-century legacy, and repeatedly and positively referred to these predecessors. Of course, this does not mean he actually *derived* his ideas from these authors. In discussing several of the ideas of Goethe, Herder, and Hegel, we must hold in mind the possibility that Werner independently or through some other authors (e.g. Sander, Spencer, Volkelt) arrived at basically similar ideas and only subsequently discovered their intimations in the older literature. But it does mean that Werner felt great affinity with these 18th-century thinkers?

Historical Roots

Which of Goethe's, Herder's, and Hegel's ideas did Werner cite approvingly in outlining his own developmental approach? From Goethe, Werner (1924c; 1926c) quoted the idea that development proceeds from a global to a differentiated state. As Goethe stated in his essays on morphology:

> The less perfect the creature, the more its parts are identical or similar, and the more they resemble the whole. The more perfect the creature becomes, the more its parts become dissimilar. In the first case, the whole is more or less similar to its parts, in the latter the whole is unlike its parts. The more the parts resemble each other, the less they are subordinated to each other. The subordination of parts points to a more perfect creature. (quoted via Werner, 1924c, p. 1)

Thus, if we replace the terms "less perfect" and "more perfect" with "primitive" and "higher," this law essentially says that primitive organisms are less differentiated and less hierarchically organized than higher organisms.

This developmental principle taken from phylogeny was complemented by Werner (1930a, 1932) with Herder's statements about the ***sensorium commune.*** In his famous essay on the origin of language, Herder had argued that speech, sight, hearing, smell, and so on originally hung together and that only with development have they become more sharply differentiated. This intersensory nature of perceived reality makes it possible that words evoke smells, sounds, forms, and so on. To put it in Herder's words:

> Where did man take the art to alter what is not sound into sound? What have the color and roundness in common with the word that so naturally developed from them, just like the word "to bleat" from the sheep? . . . How do sight and hearing, color and word, smell and tone hang together? . . . Most visible objects move; many make a sound while moving . . . The words: smell, tone, sweet, bitter, sour etc. all sound as if one felt them; for what other than feeling are all senses originally? (Herder, 1770, pp. 50–53)

Werner approvingly quoted these words to argue that in primitive organisms, the senses still form an undifferentiated whole and it is only with development (e.g., in human ontogeny) that organisms learn to have experiences that are restricted to one sense. He argued, however, that some types of individuals still can experience the world with several senses simultaneously (i.e., they show the phenomenon of *synaesthesia*) and others can learn to revive this primitive capacity. The primordial world of the organism, then, is an unbroken, holistic one.

Finally, Werner (1926c) referred to Hegel to argue that developmental capacities, once they have phenomenally disappeared, are not simply replaced or destroyed but are retained in some way to resurface in extraordinary cases of pathology. Hegel had stated that:

> Life of the present spirit is a cycle of levels that, on the one hand, still exist side by side but appear as transition, on the other. The moments the spirit seems to have left behind, it also has in its present depths. (quoted via Werner, 1933, p. 35)

This was, of course, a formulation of Hegel's principle that in development, levels of functioning of the mind are *superseded,* i.e., preserved and replaced at the same time. Werner clearly needed such a principle to be able to argue that in certain cases of pathology subjects regress and again show the more primitive levels of functioning they earlier had left behind. Without a principle of this kind cases of pathology have no relevance for arguments about development.

Thus, in the writings of these three classic authors, we can find the rough outlines of Werner's developmental approach. In development, the organism develops from global to differentiated, from nonhierarchical to hierarchical (Goethe). In this process, the mind's senses that originally form one global whole, a ***sensorium communae***, gradually differentiate into clearly separate modalities (Herder). However, under specific circumstances, older and seemingly extinct layers of mind may resurface, because development does not mean the abolition of previous capacities but their preservation in new structures (Hegel). This implies, in essence, that the rough outlines of Werner's famous orthogenetic principle (which viewed development as differentiation and hierarchic integration) were already there in the early 1920s and that the roots of this principle can be traced back to the ideas of much older thinkers.

Some Questions for Werner's View

There is no doubt that Goethe, Herder, and Hegel meant their principles to apply to one domain of development, say, phylogeny. Werner, however, stated that we can see the operation of these laws in five developmental domains, i.e., in microgenesis, ontogenesis, phylogenesis, the history of human culture, and in pathological regression. His own research was largely restricted to microgenesis and—to a much lesser extent—ontogenesis, and his claim that they are valid for the other domains as well was based on his reading and interpretation of the available literature.

Werner's position came rather close to that of several of his predecessors, such as Ernst Haeckel and G. Stanley Hall, who had seen parallels between ontogeny, phylogeny, embryonic development, and the history of human culture in their respective versions of recapitulation theory. And Werner's position raised similar questions as had been posed to these previous theories. How can the assumption be justified that the same laws rule in these different developmental domains? Can it be upheld that in human history, we find the same principles as in human ontogeny? That in ontogeny we witness the same developments as in phylogeny? Did Werner, perhaps, subscribe to any version of the recapitulation theory? Can we assume that all cultures go through similar "stages of development" and that some cultures have advanced further than others? Was Werner's thinking about non-Western cultures perhaps ethnocentric in the sense that he tacitly assumed the superiority of the European culture? These and similar questions need to be addressed if we wish to understand the full flavor of Werner's developmental approach.

About Formal and Not-So-Formal Parallels

Werner addressed several of these questions most explicitly in his grand book on developmental psychology (Werner, 1926c), and we would do well to follow his reasoning. What's crucial for the concept of development, Werner argued, is the consideration of both the *structure* of different levels and the *development* from one level to the other. Each level must be considered as an organic whole, and the development or regression from one level to the other must not be seen in quantitative terms (i.e., as a matter of addition or subtraction of features), but as a qualitative shift that is essentially unpredictable. This concept implies that any analytical unit, whether it is an ontogenetic level or the level of the culture of a people must be considered an organic whole that cannot be reduced to its individual properties.

Werner continued by stating that it is often thought that the development from one level or stage to another is a process of steady, regular increments. This is false, however. What we witness are crises or creative new achievements (***Neuleistungen***). Here, Werner gave the example of primitive man, who in his view does not think *less* logically than we do but employs *another* logic. Thus, development is creative change, the formation of truly new structures (Werner, 1926c, p. 17). Werner went on

to argue that development is not a unilinear process. Rather, in all developmental domains, he believed, we can distinguish behavioral types specific to one or the other developmental level. Layers of a more primitive mentality are still preserved in the Western mind, and this is the reason we can partially understand the mentally ill, primitive people, children, and animals (ibid., p. 33; cf. footnote 4). The idea is not to take normal Western man as the norm and quantitatively compare animals, children, primitive people, and mentally disturbed Western adults with this norm. According to Werner, we must not view these groups as lacking something. Instead, we must regard their expressions as somehow logically determined by their specific mental structure, or ***Bauplan***.

But if we find that the Western child and non-Western illiterate people share certain basic features, does it mean that they have basically the same mental makeup? This Werner denied. He explicitly rejected the recapitulation theories of Ernst Haeckel and G. Stanley Hall. Werner was concerned with formal similarities between, for instance, Western children and Australian aborigines, and in no way did he imply their identity. Australian aborigines display a level of primitivism that is also characteristic of Western children but it does not follow that they necessarily resemble our ancestors (ibid., p. 18). The problem of genealogy is of no interest to developmental psychologists, Werner stated. He just noted formal similarities.

To make his point, he listed several differences between the Western child and primitive man, such as the fact that primitive people's development begins and stops earlier than that of Western man. Werner (ibid., pp. 24–25) approvingly quoted a researcher who claimed that Negroes show a precocious motor development but that their intellectual development fairly early on comes to a halt and starts lagging behind that of Western man. Their ontogeny, so to speak, is shorter than that of European people. The same is true for animals, and it can be concluded that a long youth is characteristic of higher species.

Neither can we say that certain patients suffering from mental disturbances become *literally* like children, but useful parallels again abound. In this sense, Werner joined his superior at Hamburg, Wilhelm Stern, who had also spoken of genetic parallels.

Three Critical Points

Werner's position that the developments in his five different developmental domains are not identical *qua* content but display formal similarities raises several questions. First, we must ask ourselves whether his distinction between five developmental domains makes any sense and how these domains are related. Logically, it would seem that microgenesis and pathology fall under ontogeny. But the relationships are less than clear. For example, is any microgenetic development relevant for ontogeny? And when can we say that microgenetic findings hold for ontogeny as a whole? And in what sense can we say that pathology is a developmental category? Does not the decision to regard some mental disease as regression (i.e., a case of reverse development), depend on some debatable choice

of symptoms (cf. Barker, Dembo, & Lewin, 1941)? I do not think these questions are clearly answered by Werner.

Secondly, one may wonder to what extent Werner was able to stick to his position that he was just objectively registering formal properties and parallels. With Jahoda (1999, p. 187), I believe that Werner often forgot about his reservations and that the so-called formal parallels were found in the context of a biased and prejudiced position. The example of the limited development of Negroes given above shows that Werner's characteristics of the levels (the formal properties) of thinking in preliterate cultures were bound to be ethnocentric (and hardly could be otherwise given the biased 19th century ethnographic literature that he consumed). To make this point even more clear, consider another example: One may undoubtedly discern formal parallels between the mental development of kangaroos and women, but the question then remains, why exactly were these groups selected for comparison and why were specific features of kangaroos and women being compared and others not? In other words, the suspicion with Werner is that the groups (e.g., Negroes and children) and features he selected for formal comparison were selected on the basis of some prejudice (cf. Jahoda, 1999).

Thirdly—related to the previous points—I believe there is a problem with Werner's thinking about other cultures. In all the books in which Werner made use of the ethnographic literature, he followed the same procedure: He outlined the developmental stages (from more primitive to less primitive) of some capacity, say, the ability to write poems using rhythm, rhyme, alliteration, etc., and then showed that the most primitive stage in poem writing was characteristic of the most primitive society, the more advanced lyrics were characteristic of more advanced societies, and so on.

Comparison of Societies

Nowhere did Werner explain how he arrived at his global assessments of cultures as a whole, say, that North American Indians are less primitive than Australian aborigines or African bushmen. And this poses a serious problem for his thinking, because unless the judgment about a specific capacity and the assessment of the level of a specific culture are independent, statements such as "In primitive society X, the level of poetry is primitive" become completely tautological.

The empirical (although not very reliable) material Werner had at his disposal consisted of hundreds of examples in the anthropological literature of cultural accomplishments of peoples, tribes, clans, etc., living in different parts of the world. In his armchair, he could compare the formal properties of their songs, etc., with those of Western children. But how could he rank societies by making statements such as "In the more advanced society of X, we find the more refined songs with property Y"? There is no way he could do that, in my opinion.

Ranking societies would involve assessing the poetry, prose, dance, religion, morals, art, technology, social structure, laws, and so on, of various societies according to some debatable standards and then arriving at global qualitative or quantitative conclusions concerning the relative "value" or "level" of these societies. But what standards could that be? In what sense is monotheism more advanced

than polytheism? And shamanism on a higher level than spiritism? And given that one could reach consensus concerning one particular cultural phenomenon, how would one come to global assessments of cultures as a whole, let alone compare them in meaningful ways? (cf. Van der Veer, 1996a; 1996b) That would be very problematic, I think.

And yet throughout his career Werner's books abound with statements about the alleged levels of cultures. He spoke, for example, about our Western "advanced spiritual existence," "heightened mental *habitus*," "spiritual superiority" (Werner, 1924c, pp. 3/4), and about Western "advanced cultural man" (Werner, 1926c, p. 99), whom he contrasted with the "lower races" (ibid., p. 42) and the "poorest types of pygmoid tribes" (Werner, 1931a, p. 86). Such judgments were quite typical of the beginning of the 20th century and even more so of the 19th century, but they were without justification, and therefore I think it is fair to say that Werner, despite his repeated emphasis on the purely formal nature of his endeavor, fully shared the ethnocentric bias of his time (cf. Jahoda, 1999).

In sum, I believe Werner's developmental position as outlined in his major books can be criticized on various theoretical grounds. It is now time to take a closer look at the empirical evidence that Werner gathered to buttress his theoretical position.

INTERPRETING EMPIRICAL FINDINGS

Werner found justification for his theoretical claims in the research findings concerning the five developmental domains mentioned above. As I said before, his own research concerned the domains of microgenesis and ontogeny. For the other domains he had to rely on his extensive knowledge of the existing literature. It is now time to take a closer look at the nature of the evidence that Werner adduced to justify his theoretical claims. I will concentrate on Werner's microgenetic work, his view on the findings concerning ontogeny and ethnography, and on his view of physiognomy and the intersensory nature of perception. In the context of our discussion of Werner's (1926c) book on developmental psychology, some attention will be paid to the remaining two domains of development, that is, phylogeny (i.e., comparative psychology) and pathology (i.e., deranged individuals who have supposedly regressed to an earlier state of development or at least have changed into a state that is structurally similar to an earlier state).

Physiognomy

The topic of physiognomy is a curious one and one typical of Werner. Some of its roots are already discernable in the first paper he ever published. In this theoretical paper, he (1912a) attempted to make distinctions on a genetic basis between various sorts of concepts. 'Dynamic concepts', for instance, are characteristic for young children.

One type of dynamic concept (the *practical concept*) is no more than the tendency to react in specific motor ways when confronted with a certain class of objects. Balls, for example, elicit the tendency to catch them, throw them, and so on. Such tendencies slowly develop as other, less appropriate, actions (e.g., biting the ball) fade away. Another type of dynamic concept (the *aesthetic concept*) is the motor imitation of certain objects and is rooted in play. Children can, for example, imitate cars by making the appropriate movements and sounds.

Werner then distinguished various types of 'static concepts' and claimed that individual persons and populations may show a preference for this or that type of concept. Take balls, for instance. Balls can be grasped in three diverse ways. First, as objects of a specific form and material. Second, as something with which we can do specific things (e.g., throw it). Third, as something that can be imitated (e.g., by jumping up and down). In all cases, subjects display an understanding (a 'concept') of the object. Now Werner claimed that some persons (e.g., the writers of lyrical poetry) prefer static (contemplative) concepts, while others (e.g., novelists) prefer dynamic concepts. Moreover, he believed that such dispositions are characteristic for whole nations. The Latin peoples, for example, are hot-blooded and clearly prefer dynamic concepts, whereas the cold-blooded Germanic peoples, with their disposition toward quiet contemplation, resort to static concepts (Werner, 1912a, p. 55). The difference in spiritual nature (*Volksgeist*) between Latin and Germanic people is evident in products of art such as paintings but mostly in language, that "reflection of all spiritual and emotional life of a people."

Werner even viewed indications for the different spiritual nature of peoples in the way they compound words. French compound words are much more logical and functional than German composite words, he argued. The German words *Backfisch* (fried fish) and *Backofen* (oven) do not make clear whether the object can be fried (*Backfisch*) or is needed to fry something (*Backofen*). In both cases, the word used is *Back*. In French, however, these functions are clearly differentiated, Werner argues. Fried fish is *poisson fris*, but an oven is a *four à cuire* (an oven to bake). In this respect, then, French is much more logical than German, he reasoned.

Werner's logical distinctions between various sorts of concepts do not seem to be of any practical value, and the generalizability of his examples may be doubted (cf. Jahoda, 1999, p. 188). But this early paper announced in interesting ways several of Werner's later themes. First, there is the idea that children use different sorts of concepts than adults. Second, there is the idea that persons belonging to one culture share certain ways of feeling and apprehending reality. And third, there is the conviction that these become expressed in language. Similar assumptions would play a role in Werner's later physiognomic writings.

Comparative Physiognomy

It was in 1929 that Werner first explicitly dealt with the idea of a comparative physiognomy of language. He (1929a) explained that we can apprehend words (and objects in general) in a sober, objective way but also in the physiognomic way. Besides their meaning, all words evoke in the person certain images, colors,

smells, etc. That is, they evoke certain connotations that do not coincide with the denotation of the concept. These connotations, however, differ between language communities. Every nation has its fundamental attitude (***Grundhaltung***), its language spirit (***Sprachgeist***), and these are expressed in the words. Consequently, we can do comparative language physiognomy. Referring to Humboldt's idea of the inner and outer form of the concept, Werner claimed that the outer form of words is dealt with in the objective investigation of word meanings in different languages (comparative linguistics). The inner form, however, is investigated in physiognomy. He gave as an example the following: The German word ***Seife*** (soap) connotes a formless, liquid, syrup-like substance. The French ***savon*** (soap), however, sounds like a well-formed, fashionable soap for ladies. From other examples as well, it seemed to follow that the French language is better defined, thing-like, and chic. This is also reflected in the way French people speak, well articulated and clear, unlike the diffuse mumbling of Germans.

Werner claimed that he had also begun to question Russian subjects, and here it turned out that German was the more formal, disciplined, and rational language. Russians experience their words as boundless, emotional, directionless, sometimes mystical. The Russian ***zhit'*** (to live), for instance, is much more directionless and dark than the gay German word ***leben*** (to live). The Russian ***vor*** (thief) is a nicer fellow than the German ***Dieb*** (thief), indeed he can sometimes be a hero. This seemed to fit the Russian nature as analyzed by Semyon Frank, Werner argued.[1] Thus to Werner (1929a), comparative physiognomy appeared to be a discipline that offered a phenomenological, deep view of language free from prejudices, a discipline that could be used to complement linguistics and psychology.

But how did Werner know what connotations words have in different languages? How did he know the images and feelings, etc., that a word elicited? These and many other questions were answered in his monograph on physiognomy (Werner, 1932). Here, Werner argued that there is a conception of the world that precedes the objective, rational, conceptual view. This conception focuses on fluent, dynamic traits. Just like we cannot describe a face in purely formal terms, just like we cannot capture the unique expression of a face in words (cf. the failure of photo-fit pictures used by the police), we cannot capture the world in formal, rational concepts. Paintings, buildings, pieces of music, and spaces may have an inner tension and dynamic character that defies description in the "language of concepts" (***Begriffssprache***). Our modern rational view of the world is a later development of an original pre-intellectual view, which focused on emotions and expressive

[1] The Russian philosopher Semyon Lyudvigovich Frank (1877–1950) was internationally known in the early 20th century. He lectured in various European countries and was also quoted by, among others, Lev Vygotsky. With Berdyaev and others, he published the volume *Vekhi* [*Landmarks*] (1909/1967) in which they criticized the philosophical materialism and atheism of the Russian intelligentsia. In 1922 Frank was expelled from the Soviet Union for his philosophical and political views. While in exile in, respectively, Berlin, France, and London, he continued writing about religious-philosophical themes. Two of his more well known books are *Krushenie kumirov* [*The Downfall of Idols*] (1924; in Frank, 1990) and *Smysl zhizni* [*The Meaning of Life*] (1926/1976).

movements, and did not favor one sense above the others but was "intersensorial" (see below). This does not mean that the physiognomic way of grasping the world has disappeared: it is still there in our aesthetic judgments and creative art, but it has receded to the background in most individuals.

Language as well can be understood in a rational, conceptual way and in the physiognomic way. A rational approach to the word "house," for example, would be to give its defining features, indicate its function, and so on. The physiognomic approach to the word "house" would be to ask people what expressive value this word has to them. For instance, does it have a specific color or form, does the word feel hard or cold, does it sound sharp or soft, is it static or dynamic? Gifted people—and Werner claimed artists and poets were particularly gifted in this respect—can easily produce such physiognomic descriptions of words. That people are capable of "feeling" the color or form of words, Werner (1932, p. 18) explained by positing with Herder that our senses were originally not as sharply divided as they are now, that there existed, and to an extent still exists, a *sensorium commune*—an undifferentiated sensory center (see above). Physiognomic perception thus illustrates that the developmental principle of differentiation has not been carried to its extremes in the case of the development of perception.

Examples of Physiognomic Perception

It may be instructive to present some examples of physiognomic reactions to words, both to give the reader an idea what physiognomic descriptions are like and to give an indication of the immense variety in the type of reactions. One subject, for instance, reacted to the presentation of the word ***kalt*** (cold) as follows:

> The external form of 'kalt' seems to me to be hard and sharp, as if it is made from metal. It appears to me like a whitish-gray, like gleaming metal. The metallic gleaming seems to be particularly clearly expressed in the 'l' and the 'a,' but all parts of the word do have something of this peculiar hardness and coldness. (Werner, 1932, p. 35)

This subject experienced the word in a strikingly visual manner, describing the "physical" properties of the word as if they were seen. Another subject reacted to the word ***hart*** (hard) in a completely different way, basing her description on bodily experiences:

> First I experience a specific (immediate) body organization with a center in the back and the neck, particularly strongly in the upper cervical vertebra. It corresponds exactly to the word image and its meaning, has a steel-like quality. Then the word dissolves for some time. I am however rather rapidly able to get it again when I concentrate on the 'h' and 't'. What I first experienced in myself is now graphically present: a vertical organization just like in myself. Starting from this I regain the image. But now it is clearly separated from me. Has an existence outside for itself. Is made of a light-colored substance, somewhat rigid and stiff, sharp-edged as well. (ibid., p. 53)

Ways for Investigating Physiognomic Perception

Werner investigated the physiognomic perception of language in various ways. Mostly he would present subjects with words or phrases written on index cards and ask them to give their impressions. But he also experimented with repeated tachistoscopic presentation of phrases or word combinations to investigate how the physiognomic "image" emerges.[2] The subjects' task was to try to identify the words until they were completely confident. The following is an example of one of Werner's protocols (the subject has to identify the tachistoscopically presented phrase ***glühendes Holz*** (glowing wood) and needs five trials to recognize it completely):

1) ...wood	Preceded by a rather long word, or two words; I have the feeling that it is something 'sourish' but that does not make sense.
2)	?
3) healthy wood	I am very surprised that this is it. I expected something with much more tension
4)	
5) glowing wood	Indeed a word with much more tension than 'healthy' and one that to me has a somewhat sourish taste

Werner (ibid., p. 62) used these protocols to argue that the experience of expressive qualities of words and phrases may precede their actual articulation. In other words, there may be something like a (subliminal) dim awareness of the quality and feeling of words before we actually recognize them and are able to formulate them. To Werner this meant that our articulate, objectified, conceptual perception of the world is preceded by a primordial physiognomic one that is vague, nonarticulate, and based on a sort of primitive bodily awareness.

In the remainder of his book, Werner dealt with various issues that will not be described in any detail here. He found that there is something like physiognomic grammar, e.g. the physiognomic perception of verbs, such as "to book," differs from that of equivalent nouns, such as "book." He described that physiognomic perception often has a spatial character. Tones or moods can be perceived as high or low, for example. He also claimed that physiognomists can be distinguished in various categories. Some people give physiognomic perceptions in terms of concrete terms, others prefer more symbolic terms, still others perceive words in terms of dynamic tendencies.

Evaluation

To the uninitiated, the physiognomic approach to language may seem arbitrary and flawed. After all, different people will tend to give different physiognomic

[2] This method—repeated brief presentation of an object—as well as others (e.g., increasing the size of a presented object until it is recognized) were explicitly mentioned by Friedrich Sander (1932, p. 336) as ways to demonstrate the development of Gestalten, or what he called their *Aktualgenese.*

descriptions of the same words, homonyms give rise to different physiognomic descriptions, and so on. So what is physiognomic perception other than free associations to words based on a meaning that is already known?

Werner naturally tried to provide answers to these obvious questions. He admitted that physiognomic perception is not and cannot be independent from knowledge of word meanings. But this dependency does not make the study of physiognomic perception superfluous, in his view. Werner denied that physiognomic descriptions of words are arbitrary—native speakers of a language share an "expressive base" (*Ausdrucksbasis*) that makes the understanding of each other's physiognomic experiences possible (ibid., p. 42). People tend to use a variety of physiognomic descriptions of words, because the words of language are complex, multilayered cultural products that allow for different perceptions (ibid., p. 45).

The problem with this explanation is twofold. First, the fact that I understand another person's interpretation does not necessarily mean that we share an "expressive base." On an intellectual level I understood all of Werner's German and Russian examples and yet I am no native speaker of German or Russian. Second, Werner's position cannot be refuted. Even if one were to show that the same person gives different physiognomic reactions to the same word at different time-points—which would seem to point to its arbitrary nature—this might be explained by referring to the subject's selectively paying attention to different layers of the words of our language at different times. We have no way, then, to distinguish between arbitrary and volatile associations and genuine physiognomic perceptions of different layers of words.

Microgenesis and the Intersensory Nature of Perception

It is now time to take a look at part of Werner's own experimental work on microgenesis. It was this work that provided empirical evidence for his claim that development begins with global undifferentiated structures and ends with separate hierarchically organized structures. Most of the work was carried out with a limited number of subjects (from 1 to 10 people) in the Psychological Institute in Munich.

Werner's first studies, carried out during 1915 and 1916, did not address the issue of microdevelopment directly but focused on the interference or cooperation of the different senses. The object of Werner's (1918) study about optical rhythm was to know whether optical rhythms can be perceived. Werner chose to test this possibility by indirect means, i.e., by testing whether optical rhythms (flashing lights) can interfere with (the memory of) tactile and motor rhythms. It turned out that optically presented rhythms can disturb a motor rhythm that has to be continued from memory (e.g., a metronome indicates a rhythm that the subject must continue by pressing some pad) in a similar way as acoustic or tactile rhythms do, i.e., the rhythm becomes slower or faster on account of the interfering rhythm. A-rhythmic interfering stimuli have no influence. How does one explain the interference? It seemed an automatic process. Subjects were unaware that they adapted the rhythms to each other until they had fully coincided. Werner's

explanation was in terms of psychic energy and limited processing capacity: the rhythm becomes slower because it takes energy to process the interfering light series.

Werner (1919c) complemented his investigation of rhythm with a phenomenological study. On the basis of experiments with himself and 4 other subjects, he reached several conclusions as to what it is to experience a rhythm. He first concluded that to experience a rhythm of light flashes, one needs to experience both the dark pauses in between and the light flashes themselves. Something similar holds for other rhythms. Thus, rhythm is the simultaneous experience of two or more repeatedly presented alternating events (Werner, 1919c, p. 201). But in what way does rhythm differ from mere experienced regularity? Werner's answer was that in simple regularity, one of the events (say, darkness) is not experienced as a *Gestalt* itself but simply as the time in between two *Gestalten*. In genuine rhythm, this is different. Phenomenologically speaking, the nature of rhythm is the chaining of two or more Gestalten (***mehrwertige Gestaltverkettung***), i.e., two or more Gestalten become linked (***ineinander verschoben***) so that each element is complemented (***eingebettet***) and co-determined by the other (Werner, 1919c, p. 208).

These first studies are important because they show that Werner was a careful empirical researcher who paid much attention to the subjects' subjective experiences. They also suggested that under specific circumstances, the senses cannot work separately. In further studies, Werner elaborated the issue of the intersensory nature of perception and focused more on micro-development.

Werner (1926a), for example, dealt with the question of whether subjects can be trained to perceive "micromelodies" and "microharmonies," Subjects were presented tones that differed very little in frequency. At first they hardly noted any difference. But after months of training, the perceived interval began to increase and the subjects eventually learned to hear melodies and perceive them as normal. Werner described the perceptual changes in great detail and distinguished several "genetic laws." Thus, tones and differences between tones become less vague (law of increasing definiteness, or *Bestimmtheit*), some become more dominant than others (law of the increasing subordination, or *Gegliedertheit* of the tones in the system), and so on.

In a subsequent paper, Werner (1927) argued that the differentiation between tones is not merely a matter of hearing: his subjects reported that their whole body participated, that they took different postures, that they experienced the tones in specific body parts, and so on. This led Werner (1927, p. 171) to argue that a specific bodily posture is necessary to make perception of the differences possible. He concluded that hearing is a total-body experience, that tone differences are more easy to detect if all layers of the psychophysical subject cooperate. We only realize this when we do experiments with an object world that has yet to be conquered.

Thus, these and other investigations (e.g., Schiller, 1932a; 1932b; Werner, 1930a; 1930b; Zietz & Werner, 1928, Zietz, 1931) seemed to demonstrate that perception becomes differentiated in time and that the different senses do not work separately. Visual discrimination, for example, requires a specific body set and unfolds in

time. Werner (1930a) argued that it makes sense to describe the different stages in the development of visual discrimination in terms of sensation (***Empfindung***) and perception. Tachistocopically presented colors, for example, are sensed or felt before they can be seen; words are experienced before they are read. This first stage of dim awareness we may call sensation. These sensations belong to the vital-bodily sphere that serves as the basis for objective, differentiated perception. The fact that a specific bodily posture is necessary for visual discrimination or perception to take place demonstrates that visual perception is linked to other processes and that our impression that the senses are clearly separable is either false or only valid for later stages in development.

Evaluation

Werner's empirical work on perception was highly interesting and stimulating and deserves to be studied in detail. But we may of course question the conclusions he reached. Especially interesting was his finding that perceptual discrimination is better when the whole body is prepared, i.e., when there is an enhanced muscle tone and specific posture. Werner claimed that this finding reflected an original state of the organism in which the motor sphere, the emotional sphere, and the perceptual sphere are not yet separated. He posited that our present tendency to deal with the senses as if they were clearly independent and separate is mistaken. It is not even correct for the Western adult, he argued, but even less for children and primitive people. Werner related some experiments that allegedly showed that a reverse development is possible. Subjects were asked to experience tones with their whole body (the presumed primordial way of perceiving), and after intense training, succeeded to do so (Werner, 1927c).

But what did these microgenetic experiments actually prove? Suppose someone is trained to distinguish subtle differences in the taste of wine. Does this mean he developed from a global wine perceiver to one whose taste is more differentiated? We can certainly call it that way, just like we can say that the experienced chess player perceives subtle differences where the layman perceives nothing. But here much depends on the particular examples selected. If we were to take examples from motor development—for example, the development of locomotion or the process of learning to ride a bike—it would be much harder to describe these in terms of a law of differentiation.

Thus it would seem that, on the one hand, there are processes that are traditionally considered highly relevant for ontogeny, such as the development of locomotion, that nevertheless are not easily described in terms of Werner's law of differentiation. On the other hand, there are developmental processes that are traditionally considered not relevant for ontogeny, such as developing chess skills, that can be described in terms of differentiation.

If this is true, then we should be particularly critical of Werner's repeated suggestion that the law of differentiation, which he claims to observe in his microgenetic experiments, holds for the ontogenetic and phylogenetic domains as well. It certainly seems unwarranted to draw any conclusions about these domains from

Werner's microgenetic experiments. The claim, for example, that children's perception originally has an intersensory nature is in need of independent proof. And if I am right that ontogenetic development does not always imply differentiation, and that differentiation does not always imply ontogenetic development—then it is upon Werner and his followers to argue convincingly which microgenetic processes are relevant for ontogeny and which are not. This brings us to Werner's own study of ontogeny.

Ontogeny

When Werner dealt with the developmental laws of ontogeny, he usually relied on the existing writings of child psychologists such as Ament, Idelberger, Piaget, the Sterns, Sully, and so on. He rarely empirically investigated the mental development of children himself. The major exception was his early monograph on the development of children's ability to sing (Werner, 1917).

Musical Development

In this early study Werner studied 45 children from 2.5 to 5 years old, and registered their attempts to sing by means of a phonograph. The children were required to sing two melodies of their own making. One melody had to be with lyrics (using a text known by the children and provided by Werner) and another without lyrics (making la-la-la sounds). The recordings took place in several of the Viennese homes for children that were founded during the war (Werner, 1917, p. 7).

Werner first gave a detailed description (with staves) of the melodies the children produced in terms of the motives, the number and pitch of the tones, and the rhythms used. He then proceeded to analyze his findings. Werner found that for the youngest children, the melodies with lyrics turned out to be much richer than the melodies without. His explanation was that the lyrics themselves (mostly one phrase long) have a melodic structure that elicits a more complex melody. With older children, the difference disappears because the melodies without lyrics become more complex. This finding in itself led Werner to dismiss the melodies with lyrics as a reliable indication of the child's musical development. Both in young and older children, the result is substantially influenced by the sentence structure, which is something that comes from the adult world (ibid., p. 48). Thus, according to Werner, melodies without lyrics provide us with the clearest indication of the child's musical development.[3]

Werner then proceeded to analyze what the melodies of children in the same age group have in common, in order to give a description of stages in development. Again he provided the reader with much technical detail about the melodic

[3] This distinction between what is truly characteristic of the child and what is merely borrowed from the adult world was also characteristic of other thinkers, such as Piaget. It was Vygotsky who considered this separation to be artificial and theoretically unsound (Vygotsky, 1935, in Van der Veer & Valsiner, 1994, p. 361).

accomplishments of the subjects (using musical terms such as *portamento*, *glissando*, and *ambitus*). Werner regarded both what he called the elements of the melodic material (the *ambitus*, or range, the number of different pitches, and the intervals) and its structure (e.g., variations, pitch order, final). He emphasized that ontogenetically, later, more developed melodic structures do not replace older forms but complement them. Thus, an older child may display older, more primitive forms plus a new form (ibid., p. 55).

Werner had made very fine age distinctions (he distinguished 10 age groups for the period from 2¾ to 5 years) and as a result, he had no more than 3 or 4 subjects per age group. In spite of these limited numbers, he still thought he could distinguish different melodic types characteristic of each age period. The first, most simple, melodic type characteristic of children under 3 years old, for example, displayed the following features: a frequently repeated descending, two-tone minor third motive plus derivations caused by narrowing of the *ambitus*. The fifth and highest type, characteristic of children up to 5 years old, was much more complex. Among other things, it had more tones, quarter steps as minimum intervals, a maximal *ambitus* of a diminished fifth, and so on.

Characteristic of all childish musicality and of childish activity at large is its repetitive nature, Werner (ibid., p. 66) stated, and he referred to Baldwin's concept of the "circular reaction" to clarify this finding. At first, children repeat their melody as an undifferentiated mass, and they are unable to sing a song in another key, because this requires a perception of the parts or relationships of the whole. But, gradually, the child will become able to repeat not the whole, but only parts of it.

This latter remark and his remark that, ontogenetically, structures do not replace but complement earlier ones were about the only observations of a more general nature about child development that Werner made. He subsequently did not carry on his studies into the musical development of the child, despite his life-long fascination with music. The reason may have been that the investigation triggered his interest in the child's mental development at large.

The Magic of Magical Thinking

A recurrent theme in Werner's work is that both mankind and children pass through a stage of magical thinking. The information about the history of mankind is necessarily indirect, but with children, one may use more direct means. Werner (1928a) related that he and Martha Muchow gathered information about children's magical thinking via surveys filled out by either parents and other caretakers of children or by adults who looked back at their magical thinking in childhood.[4]

The surveys yielded a wealth of examples in which Werner tried to bring some order. He interpreted young children's resistance against any change of habits or tradition (e.g., in the reading of stories, in bedtime rituals) as an example of their

[4] In Werner's archives, there is an anonymous letter (dated 9 October 1929) by a woman who describes the magical rituals she practiced in childhood. This shows that Werner and Muchow continued to gather information on childhood magic.

emphasis on the whole rather than on the parts of a structure. In older children, Werner distinguished two types of magical acts: first, the attempt to control fate directly (e.g., through prayers, through rituals bordering on compulsive acts, by touching objects that bring luck); and second, the attempt to interpret fate by means of various "oracles" (e.g., an event will take place if the child throws a 6 with the dice, if the child's father comes home before a specific time, if car A reaches the traffic lights before car B). Characteristic of all magical thinking, Werner (ibid., p. 466) concluded, is a low degree of differentiation (***Gliederung***): the child's emotions and actions are fused and children are focused on the whole rather than its parts, nor does the child clearly distinguish between itself (the ego) and the world.

EVALUATION. Werner's investigation of the development of musical ability is interesting and deserves to be repeated on a larger scale, preferably with a longitudinal setup. Such a study might show that his assumption that there is such a thing as a spontaneous musical development uncontaminated by the adult world is questionable. His study of magical thinking in children was interesting as well. But here, too, one would like to see longitudinal data. Such data might show whether adults indeed display less magical thinking than children do and, if so, by what other symbolic means to control the world magical thinking is replaced.

Werner's attempt to explain magical thinking in terms of a lack of differentiation seems somewhat artificial to me: much depends upon the features one pays attention to and the way one interprets them. For example, Werner explains children's insistence to have a story told each time in exactly the same way by positing that they emphasize the whole rather than the parts of a structure, i.e. children cannot differentiate between the essential and nonessential parts of a story. But, in my view, he might as well have concluded that children are very good at differentiating between different versions of the same story because they pay close attention to details. In other words, in my view, the same behavior seen from different viewpoints may be regarded as either much or little differentiated.

Ethnography

Werner's extensive reading of the ethnographic literature became apparent in his books on the origin of metaphor and lyrics (Werner, 1919b; 1924c), and in his book on genetic psychology (Werner, 1926c; cf. 1931a). The latter book deserves a separate discussion. Here I will limit myself to his books on metaphor and lyrics. Both were written during World War I, but could not be published at that time.

Werner's (1919b) study on the origins of metaphor was published in the series of publications of the Leipzig Psychological Research Institute edited by Felix Krueger. In his preface, Werner stated that it actually was an expanded section of his book on lyrics.

Is it possible to study the origin and development of metaphor? The answer, Werner said, depends on what we mean by the terms "origin," "development," and "metaphor." He postulated that the development of humanity has "materialized in the spatial juxtaposition of contemporary cultural levels" (Werner, 1919b,

p. 1), which was a roundabout way of saying that present-day "primitive" cultures can throw light on earlier stages of human development. In other words, to understand our past, we can travel to contemporary non-Western people. These people allegedly show different degrees of cultural primitiveness and thus represent different stages in the development of mankind. Werner never made clear the criteria he used to measure the "cultural age" of a people and its level of "primitiveness," and nowhere did he deal with the question of whether these concepts can be defined or measured independently. His thinking in this regard coincided with most of the 19th century authors whose works he abundantly referred to.

The Development of Metaphor

Werner wished to reserve the term "metaphor" for cases where the subject deliberately used one term instead of the other knowing very well that the terms do not fully cover each other. He argued that such deliberate use is not possible for the most primitive people. When, for example, these people claim they are parrots, they do not wish to say they are in some respect similar to parrots and in others not. Such people really believe they are equal to parrots.

Werner's argument was that the origin of metaphor is rooted in the pneumatic worldview. By the pneumatic worldview he meant the belief in ***pneumas*** or invisible forces operative in the things around us. Such a belief in hidden forces is widespread among primitive people and involves a number of assumptions, such as all beings have a ***pneuma***, it can be operative without losing its power, and it can be communicated to another thing or being.

The relationship between ***pneuma*** and taboo, Werner argued, is complex. Transmission of ***pneuma*** through touch was believed to be very effective. Hence, it became forbidden to touch dangerous objects, such as dead or sick people, out of fear that their ***pneuma*** might take possession of the person touching them. Genetically, then, the taboo for death (the corpse, the sick person) is primordial, and a taboo was originally the prohibition to touch something. Subsequently, taboos became more widespread through contiguity, similarity, and contrast, i.e., through the laws of association.

It is still a long way from a prohibition to touch something to the use of metaphor. How should we conceive this development? Making use of countless ethnographic examples, Werner arrived at the following reconstruction. In magical thinking, the sorcerers or shamans originally acted directly on part of the body or object. Later, these body parts came to "stand for" the subject to be killed or cured. This marks the transition to what Werner called an object metaphor (***Dingmetapher***): the body part begins to symbolize the whole body. Werner (ibid., pp. 68–73) speculated that speech gradually entered into such magic rituals—first as a part and accompaniment of the act, later as its completion, still later as its replacement. The magic rituals also had to be kept hidden from the enemy: "The wish for secrecy and the fear for treason force the magician... to check whether the relationship between [the words for the object and the object itself] is vague enough" (ibid., p. 67). And this—to indicate an object with a word that is

deliberately vague—is already the essence of metaphoric speech. Werner (ibid., pp. 197–213) also discussed subsequent developments, e.g., an original taboo to mention some topic may turn into mockery, but these are refinements of his model. In essence, he posited that a prohibition to act in certain ways gradually turned into a prohibition to mention these acts, which in various subtle ways led to the use of metaphoric speech.

Evaluation

It is hard to give a balanced judgment of Werner's book. It does, of course, betray an immense knowledge of the ethnographic literature available at the time. But it is quite difficult to say whether the central idea of the book (that metaphor originates in taboo) made any sense. This is essentially a claim about a historical development. Werner inferred this development, however, on the basis of material gathered in contemporary cultures, a procedure that raises several questions. One thing that I find problematic is the assumption that developmental stages of mankind can be inferred from the culture and belief systems of present-day non-Western cultures. Another thing that I find doubtful is the assumption that present-day non-Western cultures can be rank ordered according to some degree of primitiveness. I would like to hear the criteria used for such rank ordering, but Werner did not provide them anywhere. Finally, it would seem to me that the concepts of the cultural age of a society and its degree of primitiveness should be defined independently. If we do not define them independently, then such claims as "older cultures are more primitive" become vacuous. In sum, I severely doubt whether what Werner was trying to do—trace stages in the cultural development of mankind on the basis of ethnographic evidence from contemporary non-Western cultures—actually made sense.

Werner's (1924c) book on the origin of lyrics was a very similar book, again rich with ethnographic detail. Werner's aim was to trace the historical development of lyrical expressions, from primitive rhythmic songs composed of meaningless sounds to modern meaningful poems that make use of sophisticated devices such as rhyme and alliteration. His procedure was essentially the same as that used in his book on metaphor: he outlined a structurally simple or primitive form of lyrics and claimed it was characteristic of the most primitive tribes, then defined a slightly more complicated form of lyrics characteristic of more advanced tribes, and so on and so forth.

More than in his book on metaphor, Werner characterized the properties of the primitive mind. It is less differentiated, i.e., diffuse, complex-like, homogeneous, not articulated (***ungegliedert***), and not yet centralized. We Western people tend to think that motor behavior, perception, ideation, and feeling, etc., are sharply separated. This is not true even in our case, let alone for the primitive mind, where feelings and logic are mixed, where concepts are tied to concrete experiences, and so on. This was the theme that Werner (1926c) would elaborate on in his later book on developmental psychology.

EVALUATION. Due to the wealth of ethnographic detail and its captivating and protracted argument, Werner's book on lyrics is a very interesting book. But its use of ethnographic data to trace historical developments runs against the same problems as have been outlined above (cf. Werner, 1926c; 1931a).

MISCELLANEOUS WORK

We now must look briefly at some of Werner's work that cannot be readily classified into one of the previous categories (e.g., Werner, 1912b; 1914; 1915; 1922; 1923; 1928a; 1928b). In fact, Werner's writings in his European period were so varied—both in content and what concerns the investigative approach—that any classification is bound to be like a Procrustean bed. Especially in his early career, he published sober experimental work side by side with clearly theoretical or even speculative writings. To the latter category we may reckon his papers on logical substitutions (Werner, 1912) and memory (Werner, 1914).

Take his theory on memory. Werner's aim was to explain why, in learning a motor skill, for instance, we remember useful things and forget useless ones. He posited that any stimulus always leads to the innervation of various nervous pathways and that the pathway becomes stronger and gets a lower threshold if it is used more frequently. He also posited that if two nerve centers are repeatedly stimulated at the same time, a pathway will be formed between these two centers that becomes stronger the more these centers are stimulated simultaneously. In fact, these two centers subsequently become interchangeable, i.e., they will be elicited by the same stimuli and elicit each other.

Werner further claimed that if for one reason or another, the nervous energy of a center is blocked, the energy will search an outlet in other pathways, both locomotor and vasomotor ones. The vasomotor stimulation will result in a constriction of the smaller arteries, which results in a greater amount of blood in the larger blood vessels and a subsequent higher blood pressure. This local higher blood pressure is felt by the subject as unpleasant. For example, when we give a hungry young child a non-edible object, the child will chew the object and then lay it aside. The stimulation of the nervous pathways of the digestive track will not result in secretory activity or in activity of the musculature of the stomach, and so on, which means that the excess excitation will flow into the vasomotor system and cause a higher blood pressure, which is subjectively felt as hunger (1914, pp. 425–7). In the case of the actual eating of an edible object, the nervous energy can be used for the digestion of the food, and any tension in the vasomotor system will disappear, a condition that is subjectively felt as pleasant. Werner's assumption, then, was that the vasomotor system acts as a sort of reservoir for superfluous nervous excitation.

Now that we know how pleasant and unpleasant feelings are caused, we can ask in what way they facilitate learning and forgetting. For this we must assume that in the case of superfluous nervous excitation, the brain arteries constrict as well, with a resulting enhanced blood pressure in the large blood vessels. The

diminished blood flow in the brain (subjectively felt as unpleasant) causes the connecting nerve paths to deteriorate to the extent that the stimulation of one center will no longer cause the other center to fire. For example, the sight of an edible object causes a visual brain center, as well as a center related to the digestive system, to become active. When the object proves inedible, the nervous excitation of the digestive center will have no outlet, and the nervous energy will flow into the vasomotor system and diminish the blood flow to the path connecting the visual and the digestive center. As a result, the connecting fiber will deteriorate, and eventually the visual center connected to the non-edible object will no longer activate the digestive center. In skill learning, unnecessary movements will disappear because they occur haphazardly and will be "reinforced" (to use an anachronistic term) less frequently (ibid., p. 439). In old age, the elasticity of our blood vessels diminishes (in subjective terms, our feelings of pleasantness and unpleasantness become less extreme), with the result that we have more difficulty in learning.

What do we make of this revolutionary brain theory? It was, I would say, no less hypothetical than the brain explanations for the phenomena of classical and instrumental conditioning. Werner did not refer to any of these investigations (he did refer to several physiological papers in the German language), but his ideas seem at least compatible with theories of conditioning, and his concepts appear no more fantastic than, say, Pavlov's concept of 'irradiation'. Suffice it to say, it is in only in the last decades that we have begun to learn more about the exact physiological mechanism of learning and memory.

Werner's (1922) book on the psychology of intensity belongs to his lesser known works. It was a careful book, based on experimental work with 9 subjects (10 subjects, when we include Werner), whose introspective declarations were highly valued by him. The subjects were presented auditory or visual stimuli and asked to rate their intensity or to judge whether two stimuli had the same intensity. This work built on the previous psychophysical work done by Herbart, Fechner, Wundt, and Stumpf, but Werner would not be Werner if he did not develop his own theoretical distinctions and empirical approach.

Werner first explained that intensity is different from quality and extension, and then proceeded to clarify that stimuli can be felt as intense when they are either very clear (***Klarheit***) or very penetrating and distracting (***Eindringlichkeit***). Thus, softly spoken, meaningful words can be experienced very intensively and clearly; distinct sounds are often perceived as loud. In practice, these distinctions lose part of their value since empirical phenomena are often of a mixed nature, i.e., it is difficult to distinguish between clear and distractive sounds. Given this restriction, one can commence asking subjects for their intensity experiences.

Werner's book relates a great number of experiments with various senses and with his attempts to understand them. He investigated, for example, whether with two ears we hear the same stimulus louder than with one ear and, if so, what the explanation might be. He noted that higher tones are perceived as louder, that attention lowers the threshold of perception, and so on. With a device of his own making, he measured the sensitivity of the skin and found, for example, that a

tactile stimulus is felt more strongly when presented alone than in conjunction with another stimulus. He demonstrated that simultaneously presented and sequentially presented stimuli tend to influence each other, i.e., the subjective experience is changed by the presence of another or earlier stimulus. Here, of course, the variations are endless. Werner worked with tones, diffuse sounds, flashes of light, and tactile stimuli.

His theoretical interpretation of the research data (Werner, 1922, pp. 239–246) was in terms of Gestalt principles and took the form of rather general "laws," such as "The impact of intensity on Gestalten is dependent on the effect upon those parts of the Gestalt that get special attention." In sum, Werner's book intended to establish certain psychophysical relationships and interpreted these in Gestalt terms.

Werner's (1923) paper breathed a totally different atmosphere. Theory was not wanted and speculation was inappropriate. What was needed was the solution to a very practical problem. A local railway company had approached the Psychological Laboratory of Hamburg University to test their train drivers. To this end, Werner and his colleagues (Ulrich Hallbauer and Hildegard Sachs, among others) built an apparatus that was intended to simulate the normal problems a train driver faces. A moving belt with signs painted on it simulated the rails and signal lights. Subjects had to react properly to these signs and bring the train (belt) to a complete stop from different velocities before a specified mark, etc. Two other belts moved in parallel motion at different speeds and could simulate pedestrians or other traffic. Mass verification of the first results was not possible because the management of the railway company insisted that the investigators begin with the real testing of their drivers (cf. Hallbauer, 1923, p. 113). It remains unclear to what extent the railway company actually used Werner's simulation device to train or select its personnel.

Other examples of Werner's broad interests are two short papers published in the local press. These deserve mentioning since they are little known and belong to a genre that Werner hardly ever practiced: popular science writing.

In a 1928 newspaper article, Werner (1928b) discussed recent experiments to experimentally induce mental disturbances by taking drugs (hashish, mescaline, opium, cocaine). The idea was that psychologists and psychiatrists could artificially create states of mind that were quite similar to those of schizophrenics and other patients. He (ibid., p. 392) concluded that through such experiments, we can change ourselves into mentally disturbed people, which would allow us to understand the pathological condition more fully and take empathy with the patients.

Slightly more bizarre is the topic of his other newspaper article of that year (Werner, 1928c). It dealt with a recent variant of phrenology advanced by a Ukrainian doctor named Biskh. Biskh's claim was that more developed mental capacities can be measured because they show less resistance to an electric current applied to the skull and suggested that his method should be used for job selection, identification of criminals, and matching of potential marriage partners (see Blakemore, 1977, for some details on the history of phrenology, including the

similar Lavery Electric Phrenometer of 1907). Werner pointed out that the results were totally unreliable, since research had shown that the resistance to electric currents is dependent on the tissue involved (bone, muscle, etc.) and the way the electrodes are attached. Rather than relying on such a crude apparatus to unriddle the mind, he concluded, we should use our intuition and judgment of character to understand the whole person.

WERNER'S HOLISTIC VIEWPOINT

There is no doubt that Werner was well acquainted with the work of the Berlin Gestalt school—he repeatedly quoted the work of Koffka, Köhler, and others—but when it comes to influence, it is fair to say that he took more from the Leipzig *Ganzheitspsychologie* approach of Felix Krueger, Hans Volkelt, and Friedrich Sander. The two Gestalt schools shared many assumptions, e.g. an inclination towards phenomenology and a distrust of purely empiricist views, but the work of Krueger and his colleagues was explicitly developmental (Valsiner & Van der Veer, 2000).

Werner's own work in the Gestalt tradition was either theoretical (e.g., Werner, 1924a; 1931b; cf. Lagercrantz, 1927) or, characteristically, microgenetic (e.g., Werner & Lagercrantz, 1924a; 1924b; Werner & Creuzer, 1927). His paper on the motor structuring tendency (*motorische Gestaltung*) was an example of the latter. Werner (1924b) argued that the Gestalt principles operative in the visual field are valid for the other "senses" as well. To demonstrate this, he asked subjects to draw certain figures with a particular set (*Einstellung*). When subjects were asked to repeatedly draw a right angle either as an articulate or a global figure, different results were obtained. In the first case, the angle became more emphasized with repetition and two clearly differentiated line segments resulted. In the second case, the figure was gradually drawn more smoothly, almost like a circle segment, and a homogeneous figure resulted. Thus, the subjects tended to structure the figures according to their set, and this structuring tendency (or *Gestaltung*) resulted in more outspoken results with repeated trials.

A somewhat similar study was carried out by Werner with the linguist Eliel Lagercrantz (Werner & Lagercrantz, 1924a; 1924b; cf. Werner & Lagercrantz, 1927; Lagercrantz, 1927[5]). Subjects were asked to pronounce words, with various stresses and different rapidity. The phonetic quality of the spoken words was measured with various devices, and subjects were asked to introspect. Werner and Lagercrantz argued that the phonetic phenomena they found, such as assimilation and dissimilation, were explainable on the basis of Gestalt principles. They also claimed that the regularities they found—for instance, that words that have various syllables (are more articulate) are more resistant to change when spoken rapidly—had

[5] Later, Lagercrantz combined Werner's ideas and psychoanalytic theory to analyze the products of Lappian folklore (Lagercrantz, 1950).

developmental relevance. After all, they reasoned, articulate forms develop out of global forms and thus should be more stable than earlier ones.

Finally, Werner and Creuzer (1927) discussed a case history that they considered relevant for the claim that the formation of Gestalten is due to the total psychophysical organism. This article thus combined the idea of a structuring tendency with that of the inter-sensory nature of perception. The subject declared that in a stroboscopic experiment, she perceived two movements at the same time: one in 2 dimensions (a circle and a triangle approach each other), the other in 3 dimensions (the circle and the triangle rotate around an imaginary vertical cylinder so that first the triangle appears closer to the front, then the circle). With the first movement, the subject claimed to 'see'; the second was 'felt'. Werner and Creuzer argued that this proved that two layers of the mind (the optic and the motor) are at work. Normally these are adapted to each other (the principle of ***Adäquation***) and with repeated trials, the phenomenon disappears. But according to Werner and Creuzer, this particular case demonstrated that different layers of the mind coexist and have to be adjusted to each other in order to yield normal clear, stable perception.

This last article was very typical of Werner's way of investigating. It combined controlled experimentation (by use of a tachistoscope), reliance on introspective evidence, an emphasis on the idea that perception is a whole-body performance, and a developmental interpretation.

The interpretation that Werner gave to these data was in terms of Gestalten. But clearly his Gestalt approach was a developmental one and as such had more affinity with Krueger's and Sander's approach than with the approach of the Berlin Gestalt school (cf. Werner, 1931b). Gestalten are not given "out there" but are the result of the subject's structuring tendencies. These structuring tendencies also cause the differentiation of the organism from a primordial global state into an articulate structure with clear-cut separate senses.

THE FAMOUS BOOK

There is no doubt that Werner's ***Einführung in die Entwicklungs-psychologie*** was the book that made him well known. In many ways it was the culmination of the work Werner had done in the preceding 15 years or so. First published in 1926, the book went through several editions, was translated into various languages (e.g., Werner, 1936), and eventually appeared in English as ***Comparative Psychology of Mental Development*** (Werner, 1948).[6] The book exerted a strong influence on contemporaries, among them Lev Vygotsky, who at the time was still fully unknown in the world of international psychology.[7]

[6] All page numbers and quotations refer to the second edition, published in 1933. An analysis of the differences between the various German editions and a comparison of the German and the English edition would be interesting, but falls beyond the scope of this chapter.

[7] There must have been some contact between Werner and members of the cultural-historical school, most probably through Luria, because in the third edition of his book Werner (1933, p. 416) referred to

The central idea of the book was to gather developmental laws from the comparisons between children and adults, animals and humans, normal and deranged individuals, and Western and non-Western ('primitive') people (see above). Werner argued that careful investigation of these various domains showed that we can describe development in terms of what he later called the "orthogenetic principle." This principle states that whenever development occurs, it proceeds from a state of relative lack of differentiation to a state of increasing differentiation and hierarchic integration. Werner (1933, pp. 44–46) elaborated on the concept of differentiation with the help of four concept pairs.

Two concept pairs concerned the structure of a phenomenon. The concept pair global-articulate (***diffus-gegliedert***) referred to the structure of a whole. When the structure has few or no independent parts, this structure is called global. When it has several, clearly separable and independent parts, the structure is called articulate. The concept pair vague-clear (***verschwommen-prägnant***) again concerned structure. We see, for example, something vaguely through a piece of paper and clearly without the paper.

Two other concept pairs concerned the meaning of a phenomenon. First, we can say that the meaning of something is indefinite or definite (***unbestimmt-bestimmt***). Second, the meaning of a phenomenon can be complex-like or syncretic rather than discrete (***komplex-abgesondert***). A dream image may be called syncretic, for example, when two persons or objects are combined into one. Normally these objects would be clearly distinguished or discrete.

With the help of these terms, Werner hoped to characterize the process of differentiation in development. He emphasized, however, that the process of differentiation goes hand in glove with a process of subordination, hierarchization, and centralization.[8] That is, as soon as a global structure develops into distinguishable, separate parts, these parts will form a hierarchy and some parts will begin regulating the others. The evolution of the mammalian brain may serve as an example.[9]

Clearly, then, for Werner the process of development had a progressive, directional character. All development, whether in the microgenetic, ontogenetic, or phylogenetic domain, proceeded from a confused, global state to a state of segmentation, dissimilarity, and subordination. This conception was influenced by the ideas of Goethe, Herder, and Hegel, as we have seen above. It also echoed the older theories of Von Baer (who described embryogenesis in terms of differentiation)

an unpublished English-language manuscript by Luria on the genesis of children's writing. For Luria's text, see Cole (1978, pp. 145–194).

[8] Much later, Hans Volkelt (1944, pp. 214–5) still felt the need to defend genetic *Ganzheitspsychologie* against the reproach that it conceived development as mere differentiation. He, too, referred to Herder (and to Aristotle's *entelechy* concept) to argue that development is integration, organization, and directedness as well.

[9] Werner's collaborator and coauthor, Eliel Lagercrantz (1950, p. 6), declared that the folklore of the Lappian people was a product of the lower parts of their brain, which somehow were still very active in these people.

and Spencer (who claimed that development proceeds from homogeneity to heterogeneity). But its more direct sources, perhaps, were the Gestalt movement and Wilhelm Stern's ideas. With Stern, Werner stated that the original state of the child is a 'diffuse' and global state and that development is differentiation or the emergence of order from chaos (Morss, 1990, pp. 188–190). From the Gestalt movement (see above), Werner took the idea that developmental change is change in organization and not the blending together of sensory images.

Werner argued that the law of orthogenetic principle manifests itself in ontogeny in various ways. One of his favorite examples was that of the developing subject-object distinction. Presumably, newly born children do not distinguish their own actions or body parts from objects and actions in the world. Their phenomenal world is a global world of bewildering impressions, and only gradually will they learn to make the ego-world distinction. This idea was quite common at the time and shared in one or the other form by such thinkers as James, Stern, and so on (cf. Morss, 1990).

More original and interesting, perhaps, was Werner's (1933, p. 156) claim that the development from a more primitive state of mind to a more advanced one also involves a development from immediate, unplanned behavior to mediate, meditated behavior. In this context, he claimed that young children's behavior is fully determined by the environmental situation. They react to stimulation from outside. Gradually, children learn to detach themselves from the environment. As Werner noted:

> The first distancing from subject and object is realized when private body means are used to master a situation. The use of means—even when they belong to the private body—always means a certain detachment from the concrete field, a partial distancing from the direct total situation in which the subject and the object are united and is a 'detour' in the broadest sense of the word. (Werner, 1933, p. 156)

To argue this view, Werner referred to the work of Lewin (who showed how children's behavior is determined by field vectors), Köhler (who argued that only higher animals such as chimpanzees are capable of making detours in reaching a goal), Guillaume and Meyerson (who replicated Köhler's experiment with apes), and Head (who argued that aphasic patients are no longer capable of making detours in playing billiards). He also mentioned the evidence gathered by Thurnwald and others that primitive people still use body parts in counting.

> Thus development proceeds by way of increasing mediacy (*Mittelbarheit*): alteration of the situation in accordance with the action, the mobilization of auxiliary means of a graphic and eventually non-graphic nature, a development that can be interpreted as a progressive intellectualization of an increasingly abstract performance of the action. (Werner, 1933, p. 157)

Thus, for Werner, development proceeds from immediate to mediate behavior, and evidence from both comparative psychology, ethnography, ontogeny, and

pathology shows that this involves making use of auxiliary means and being capable of making detours. The reader will no doubt have come across these ideas when reading the works of the Russian cultural-historical school. Indeed, it would be Lev Vygotsky who made these tenets into one of the cornerstones of his cultural-historical theory, essentially drawing on the same literature and the same examples.

Evaluation

It would be impossible and useless to summarize Werner's book in a few pages. He dealt with a great variety of topics, ranging from concept formation, perception, and children's drawings to concepts of time and space. His leading idea was that of the structural similarity between the various developmental domains. To argue this idea, he adduced an immense variety of data that made this similarity more or less plausible. But it would be misleading to think that he derived this principle from the data he gathered. On the contrary, it would be more correct to say that the principle of structural similarity was a leading principle in light of which Werner looked at all his sources. After discussing the perception of children, for example, Werner wondered about the perception of 'natural man':

> *On the grounds of genetic parallelism we must assume* that primitive natural man as well still has this perceptual unity in much higher degree than the European and that only gradually in the process of development the differentiation between image and perception develops further .... As a working hypothesis, until we have—if possible, experimental—observations of natural peoples, this idea of differentiation is very plausible. On the basis of the available data, we probably cannot convincingly prove the existence of primordial modes of perception, because all contemporary natural peoples have long since overcome the earliest stage of primitivism. Still, there is a whole series of facts that seem to prove that in contemporary natural man too the domains of imagery and perception are functionally much more connected than in adult cultural man. (ibid., p. 115; emphasis added)

This quote is highly characteristic of Werner's style of thinking. The principle of structural similarity or genetic parallelism formed his working hypothesis to look at the data of ethnography, psychopathology, and so on. In light of this principle, he searched for analogies between the different developmental domains. Sometimes these analogies were rather strained (e.g., when he claimed on p. 162 that the behavior of insects that repeat the whole action sequence when it has been interrupted at some point, was structurally similar to that of children who resist changes in rituals); sometimes they seemed more plausible. Werner did not go as far as to claim that contemporary non-Western cultures were literally like our predecessors, but nevertheless he saw interesting structural parallels. He thus essentially defended a weakened version of recapitulationist thinking.

CONCLUSIONS

In this paper I have discussed a substantial part of Werner's early European writings. It has become clear that Werner's breadth of knowledge was, by any standards, quite remarkable. His doctoral dissertation, his six monographs, and his more than 30 articles written in his European period dealt with a great variety of topics. Werner could write with equal fluency and authority about the history of lyrics, about children's magical thinking, and about the perception of rhythm and the blind spot. In other chapters of this book, it will be seen that these European investigations formed a firm basis for much of Werner's later American writings.

It is a pity that a substantial part of Werner's early European work has gone into oblivion, partly because of language difficulties (cf. Barten and Franklin, 1978), partly because they do not seem to fit the present *Zeitgeist*. Werner's psychophysical investigations, for example, are almost never mentioned, and neither are his applied papers, his articles on memory, student selection (Werner, 1919a), and so on. In my view, these experimental papers are no less, and even more, interesting than his theoretical ones. For this reason, I have paid some attention to Werner's applied work in this chapter.

Werner's theoretical developmental writings show that Werner the theorist was a Romantic speculative thinker whose thinking was deeply rooted in 19th- and 18th-century thinking. In the previous paragraphs I have raised several questions concerning his developmental views. Most important, I think, is the issue of the relationship between developmental domains (and hence the potential relevance of findings in one domain for another) and the issue of the rank ordering of cultures. In the end, these issues show, I think, that Werner deluded himself by thinking and writing that he was just registering objective formal parallels between different developmental domains. The rank ordering of cultural products, for instance, carefully followed the ranking of cultures from the older (ethnocentric) literature. In discussing the degree of differentiation in, say, the lyrical products of Australian aborigines, Werner knew well that according to his 19th- and 18th-century literature, Australian aborigines were supposed to be among the most culturally primitive tribes of mankind and his judgment could not be, and was not, independent of that knowledge. The formal principles of differentiation and hierarchical integration, no matter how interesting they are for a systemic view of development, were applied in the context of ethnocentric thinking, and thus led to dubious conclusions.

Despite these criticisms, I feel that Werner was one of the more interesting figures of the psychology of the beginning of the 20th century. Werner's writings, and especially his *Comparative Psychology of Mental Development*, have inspired generations of psychologists and still form a source for hypotheses. If Werner failed in his theoretical writings, then at least he failed in an interesting way. There is little more that one can aspire as a theorist if one studies such complicated issues as Werner did. If this chapter has succeeded in highlighting Werner's theoretical

endeavor and in redressing the contemporary textbook picture of Heinz Werner, then it has served its purpose.

REFERENCES

Argelander, A. (1927). *Das Farbenhören und der synästhetische Faktor der Wahrnehmung*. Jena: Fischer.

Barker, R., Dembo, t., & Lewin, K. (1941). *Frustration and regression: An experiment with young children*. Iowa City, IA: University of Iowa Press.

Barten, S.S., & Franklin, M.B. (Eds.) (1978). *Developmental processes: Heinz Werner's selected writings*. New York: International Universities Press. (2 vols)

Berdyaev, N. A. et al. (1909/1967). *Vekhi*. Frankfurt am Main: Posev.

Blakemore, C. (1977). *Mechanics of the mind*. Cambridge: Cambridge University Press.

Cassirer, E. (1922). *Die Begriffsform im mythischen Denken*. Berlin: Teubner.

Cassirer, E. (1931). Mythischer, ästhetischer und theoretischer Raum. In *Vierter Kongress für Ästhetik und allgemeine Kunstwissenschaft. Hamburg, 7–9 Oktober 1930* (pp. 21–36). Stuttgart: Enke.

Cole, M. (1978). *The selected writings of A.R. Luria*. White Plains, NY: Sharpe.

Crain, W. (1992). *Theories of development*. Englewood Cliffs, NJ: Prentice Hall.

Frank, S.L. (1926/1976). *Smysl zhizni*. Brussels: Zhizn s Bogom.

Frank, S.L. (1990). *Sochineniya*. Moscow: Pravda.

Hallbauer, U. (1923). Prüfung der Aufmerksamkeits- und Reaktionsweise von Triebwagenführern. *Praktische Psychologie, 4*, 104–113.

Jahoda, G. (1999). *Images of savages: Ancient roots of modern prejudice in western culture*. London: Routledge.

Lagercrantz, E. (1927). Über Gestaltbildung in den Dialekten der lappischen Sprache. *Zeitschrift für Psychologie, 104*, 201–223. (Edited by H. Werner)

Lagercrantz, E. (1950). *Entwicklungspsychologische Analyse lappischer Folklore*. Helsinki: Suaomalainen Tiedeakatemia.

Morss, J. R. (1990). *The biologising of childhood*. Hove: Lawrence Erlbaum Associates.

Van der Veer, R. (1996a). The concept of culture in Vygotsky's thinking. *Culture & Psychology*, 2, 247–263.

Van der Veer, R. (1996b). On some historical roots and present-day doubts: A reply to Nicolopoulou and Weintraub. *Culture & Psychology*, 2, 457–463.

Volkelt, H. (1944). Abwehr eines Angriffes auf die genetische Ganzheitspsychologie. *Archiv für die gesamte Psychologie, 112*, 207–215.

Von Herder, J.G. (1979). *Abhandlung über den Ursprung der Sprache*. München: Carl Hanser Verlag.

Von Schiller, P. (1932a). Untersuchungen über Empfindung und Empfinden 4: Das optische Verschmelzen in seiner Abhängigkeit von heteromodaler Reizung. *Zeitschrift für Psychologie, 125*, 249–289. (Edited by H. Werner)

Von Schiller, P. (1932b). Untersuchungen über Empfindung und Empfinden 5: Die Rauhigkeit als intermodale Erscheinung. *Zeitschrift für Psychologie, 127*, 265–289. (Edited by H. Werner)

Von Uexküll, J., & Roesen, H. (1927). Der Wirkraum. *Pflügers Archiv für die gesamte Physiologie des Menschen und der Tiere, 217*, 72–87.

Von Uexküll, J. (1932). Die Umwelt des Hundes. *Zeitschrift für Hundeforschung, 2*, 3–16

Von Uexküll, J. (1929). Plan und Induktion. *Wilhelm Roux' Archiv für Entwicklungsmechanik der Organismen, 116*, 36–44.

Wapner, S., & Kaplan, B. (Eds.) (1966). *Heinz Werner, 1890–1964: Papers in memoriam*. Worcester, MA: Clark University Press.

Werner, H. (1912a). Skizze zu einer Begriffstafel auf genetischer Grundlage. *Archiv für systematische Philosophie und Soziologie, 18*, 45–62.

Werner, H. (1912b). Ein Beitrag zur Lehre logischer Substitutionen. *Archiv für systematische Philosophie und Soziologie, 18*, 431–444.

Werner, H. (1913a). Über die künstlerisch-individuellen Prozesse. *Archiv für systematische Philosophie und Soziologie, 19*, 429–441.

Werner, H. (1913b). Untersuchungen über den 'blinden Fleck'. *Pflügers Archiv für die gesamte Physiologie des Menschen und der Tiere., 153*, 475–490.
Werner, H. (1913c). Ein Phänomen optischer Verschmelzung. *Zeitschrift für Psychologie, 66*, 263–270.
Werner, H. (1914). Eine psychophysiologische Theorie der Übung. *Vierteljahrsschrift für wissenschaftliche Philosophie und Soziologie, 38*, 417–441.
Werner, H. (1915). Begriffpsychologische Untersuchungen. *Archiv für systematische Philosophie und Soziologie, 21*, 162–172.
Werner, H. (1916). *Zur Psychologie des ästhetischen Genusses*. Vienna: Unpublished Doctoral Dissertation.
Werner, H. (1917). *Die melodische Erfindung im frühen Kindesalter. Eine entwicklungspsychologische Untersuchung*. Wien: Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften, Bd 182, Abh. 4. Philosophisch-historische Klasse.
Werner, H. (1918). Über optische Rhythmik. *Archiv für die gesamte Pychologie, 38*, 115–163.
Werner, H. (1919a). Die Auslese befähigter Volksschüler in Hamburg: Das ordnen von Begriffsreihen. *Zeitschrift für angewandte Psychologie und Charakterkunde, 18*, 49–56.
Werner, H. (1919b). *Die Ursprünge der Metapher*. Leipzig: Engelmann.
Werner, H. (1919c). Rhythmik, eine mehrwertige Gestaltenverkettung: Eine phänomenologische Studie. *Zeitschrift für Psychologie, 82*, 198–218.
Werner, H. (1922). *Grundfragen der Intensitätspsychologie*. Leipzig: Barth.
Werner, H. (1923). Prüfung der Fähigkeit der Geschwindigkeitsschätzung und Bremsführung an Triebwagenführern. *Praktische Psychologie, 4*, 113–117.
Werner, H. (1924a). Studien über Strukturgesetze 1: Über Strukturgesetze und deren Auswirkung in den sogenannten geometrisch-optischen Täuschungen. *Zeitschrift für Psychologie, 94*, 248–264.
Werner, H. (1924b). Studien über Strukturgesetze 2: Über das Problem der motorischen Gestaltung. *Zeitschrift für Psychologie, 94*, 265–272.
Werner, H. (1924c). *Die Ursprünge der Lyrik: eine entwicklungspsychologische Untersuchung*. München: Reinhardt.
Werner, H. (1926a). Studien über Strukturgesetze 4: Über Mikromelodik und Mikroharmonik. *Zeitschrift für Psychologie, 98*, 74–181.
Werner, H. (1926c). *Einführung in die Entwicklungspsychologie*. Leipzig: Barth.
Werner, H. (1927). Studien über Strukturgesetze 5: Über die Ausprägung von Tongestalten. *Zeitschrift für Psychologie, 101*, 159–181.
Werner, H. (1928a). Über magische Verhaltungsweisen beim Kinde und Jugendlichen. *Zeitschrift für pädagogische Psychologie und Jugendkunde, 29*, 465–476.
Werner, H. (1928b). Experimentell erzeugte Geistesstörungen. *Berliner Illustrirte Zeitung*, 391.
Werner, H. (1928c). Phrenologie. *Hamburger Fremden Blatt*.
Werner, H. (1929a). Über die Sprachphysiognomik als eine neue Methode der vergleichenden Sprachbetrachtung. *Zeitschrift für Psychologie, 109*, 337–363.
Werner, H. (1930a). Untersuchungen über Empfindung und Empfinden 1: Das Problem des Empfindens und die Methode seiner experimentellen Prüfung. *Zeitschrift für Psychologie, 114*, 152–166.
Werner, H. (1930b). Untersuchungen über Empfindung und Empfinden 2: Die Rolle der Sprachempfindung im Prozess der Gestaltung ausdruksmässig erlebter Wörter. *Zeitschrift für Psychologie, 117*, 230–254.
Werner, H. (1931a). Raum und Zeit in den Urformen der Künste. *Zeitschrift für Aesthetik und allgemeine Kunstwissenschaft. Beiheft, 25*, 68–86.
Werner, H. (1931b). Das Prinzip der Gestaltschichtung und seine Bedeutung im kunstwerklichen Aufbau. *Beihefte zur Zeitschrift für angewandte Psychologie, 59*, 241–256.
Werner, H. (1932). *Grundfragen der Sprachphysiognomik*. Leipzig: Barth.
Werner, H. (1934). L'unité des sens. *Journal de Psychologie, 31*.
Werner, H. (1936). *Compendio de psicología evolutiva*. Barcelona: Salvat Editores.
Werner, H. (1948). *Comparative psychology of mental development*. New York: International Universities Press.
Werner, H. (1965). *Psicología comparada del desarrollo mental*. Buenos Aires: Paidós.

Werner, H., & Creuzer, H. (1927). Studien über Strukturgesetze 6: Über einen Fall von Schichtspaltung beim Bewegungssehen. *Zeitschrift für Psychologie, 102*, 333–337.

Werner, H., & Lagercrantz, E. (1924a). Experimentellpsychologische Studien über die Struktur des Wortes: Vorbericht. *Mémoires de la Société Finno-Ougrienne, 52*, 316–339.

Werner, H., & Lagercrantz, E. (1924b). Studien über Strukturgesetze 3: Experimentellpsychologische Studien über die Struktur des Wortes. *Zeitschrift für Psychologie, 95*, 316–363.

Witkin, H. (1965). Heinz Werner. *Child Development, 30*, 307–328.

Zietz, K. (1931). Untersuchungen über Empfindung und Empfinden 3: Gegenseitige Beinflussung von Farb- und Tonerlebnissen. *Zeitschrift für Psychologie, 121*, 257–356. (Edited by H. Werner)

Zietz, K., & Werner, H. (1928). Studien über Strukturgesetze 8: Über die dynamische Struktur der Bewegung. *Zeitschrift für Psychologie, 105*, 226–249.

Part II

Topics in development

Werner in North America

4

METAPHOR AND PERCEPTION

Leonard Cirillo

In his years at Clark University, Werner inspired research programs in several different areas. These included research in perception, especially space perception, research in language and symbolization, and clinical research using inkblot tests. Although these programs were pursued from a single theoretical perspective, that perspective is specialized differently for different phenomena in varying contexts. Thus, different specifications of Werner's developmental concepts existed side-by-side historically. Wernerians doing clinical research with inkblot materials usually relied on Werner's concepts of perception to direct and organize their work. I think that the later concepts that Werner and Kaplan formulated to deal with symbolization would have been even more fruitful in this area. In this regard, I think the Wernerian enterprise shared in a more general movement in the human sciences that backgrounded traditional conceptions in favor of conceptions more adequate to cope with problems of representation and meaning.

In the following, I will elaborate this shift in Wernerian developmental research and comment on some of its implications. In doing so, I will first outline briefly the three areas of research involved.

THREE LINES OF RESEARCH

Clinical Research with Inkblot Tests

One of the lines of research considered here was carried out in clinical settings by clinical psychologists and graduate students who applied Wernerian theory to inkblot techniques widely used in clinical assessment (Hemmendinger, 1960; Phillips & Smith, 1953). The many empirical studies carried out by these investigators treated inkblot responding as a *perceptual* activity. The responses were

thought of as percepts whose organization could be assessed according to the orthogenetic principle. For instance, responses were ordered according to how the blot areas contained in them are structured, from undifferentiated or global wholes through segregated details to differentiated and integrated wholes. Such novel categories for developmentally ordering perceptual responses were used in empirical research on ontogenetic series, on microgenetic changes, and on pathological groups (Friedman, 1953; Hemmindinger, 1953; Phillips & Smith, 1953; Werner, 1945, 1957).

Although these research reports were couched in perceptual terms, the methods used were partly those of traditional clinical, verbal, "inquiry" of the person regarding his or her response. The person names the percept and verbally describes for the investigator how it looks. Some studies also incorporated methods of the perceptual laboratory. For example, studies of the microgenesis of the percept would expose an inkblot card tachistoscopically at sub-threshold levels (Werner, 1957). Nevertheless, the response was not given in the readily quantified measures of perceptual laboratory research but rather in relatively free verbal discourse.

This line of research demonstrated that Werner's theory could incorporate phenomena beyond the usual boundaries of laboratory psychology and of child development research. The impact of the work on clinical practice and research is still evident in the streamlined versions of developmental scoring that have become standard ingredients in assessment by means of inkblot techniques (Exner, 1986, 1991; Holtzman, 1961).

Perception Research

A second line of research was carried out with Wapner and many others, embodying an organismic approach to perception called ***sensori-tonic field theory*** (see chapter 6 in this book). The sensori-tonic group investigated a variety of problems in perception, especially space perception (Werner & Wapner, 1949, 1952). They used traditional psychophysical methods to quantify the effects of experimentally manipulated conditions on perceptual properties. For example, a luminescent rod in a darkroom would be adjusted until it seemed vertical to a research participant. Different studies of apparent verticality measured the physical position of the rod under various conditions of asymmetrical stimulation, e.g., body tilt, sound to one ear. In this way effects of non-visual organismic stimulation on visual space perception could be objectively demonstrated with experimental methods (e.g., Bauermeister, 1964; Wapner, Werner, & Chandler, 1951).

This work adopted the traditional psychophysical methods (Boring, 1942) that would have been familiar to 19th century researchers. However, the research demonstrated effects that transcended the traditional boundaries between the sense modalities and between sensation and movement. Further, it demonstrated developmental variations in these effects. In both these respects, the research used traditional experimental methods to demonstrate holistic theses beyond the confines

of traditional perceptual research and even those of the Berlin Gestalt psychology tradition.

Symbol Formation Research

A third line of research, with Kaplan, took an organismic and developmental approach to representational symbolism (Werner & Kaplan, 1963). The symbol group included many graduate students working on theses and dissertations and remained active after publication of the book. It investigated symbolic representation by asking participants to select or produce fitting representations for some verbally designated "referent" or to name fitting referents for some "vehicle" provided by the investigator. An inquiry was conducted with the research participant to understand how the symbolic vehicle stood for the referent. For example, the investigator, after briefly introducing the participant to the medium of non-pictorial line drawings, would ask the participant to make drawings to represent the meanings of sentences differing only in tense, e.g., "the man ran," "the man runs." A research participant might repeat whatever line drawing he or she produced to represent "the man runs," but in lighter lines to represent "the man ran." Upon inquiry, the symbolizer might say that the heavier line indicates full presence, while the fainter line less than full presence.

This line of research used methods more akin to those originated by the Würzburg school (Humphrey, 1951) than to the experimental methods of measurement standard in perception research. These methods of verbal inquiry were also like those used since Rorschach's time to understand precisely how a patient saw his or her response in the inkblot. However, the questions these methods were adopted to answer were formulated in tune with the general question posed by the neo-Kantian philosopher of symbolic forms, Ernst Cassirer (1955), that is, how a concrete perceptual object could come to signify a conceptual meaning. This research, too, demonstrated a holistic thesis—that a symbol involves, rather than an arbitrary association, a meaningful, inner relation between vehicle and referent—a relation by which the vehicle expresses or reveals its meaning. The vehicle and the conception are reciprocally reshaped so that the former is suited to adequately capture an aspect of the latter.

RELATIONSHIP OF LINES OF RESEARCH

The different lines of research had different, sometimes overlapping, personnel, and Werner's own kind and depth of involvement varied between them. Many of those working on two of these lines of research, "the sensori-tonic project" and "the language project," shared the same general theoretical orientation and communicated often. Nevertheless, they used different methods to address questions arising within different research traditions.

How did Werner and his colleagues understand the theoretical relationship between the two lines of research? They often drew on the concept of "levels" to distinguish psychological activities that differ in accordance with the orthogenetic principle, i.e., activities manifesting increasing differentiation of part-whole or means-ends (form-function) relation. Levels (Bunge, 1969; Feibleman, 1954; Schneirla, 1949) are, in this view, distinguished logically, not necessarily temporally, as in the concept "stages." That is, whether a temporal series is considered an "advance" depends on whether it also corresponds to the orthogenetic principle (Kaplan, 1967—see also chapter 5 in this book)—whether the items in the series represent advancing levels.

Although levels may be specified differently for different psychological activities, as in Werner (1948), Wernerians also sometimes spoke of more general levels. It was common, following Werner, to distinguish three general levels of psychological functioning: sensori-motor action, perception, and conception. According to this scheme, the research of the sensori-tonic and the language projects would be thought of as dealing with two different levels of functioning, the second and third—perception and conception.

Werner and Kaplan (1963) delineated a different series of levels in their work on symbol formation. They distinguished between tropistic-reflex reactions to stimuli, goal-directed sensory-motor action upon signaled things, and contemplative knowledge about objects. The last level, of contemplative knowledge, includes both percepts and concepts, in that both these mediate between human beings and their physical milieu.

According to this system, a distinctive instrument is forged within this level whereby symbolizers use the perceptual properties of objects and events to represent (stand for) conceptions. The conceptions represented are shaped by the percepts representing them, and the perceptual properties of the vehicles are reshaped so as fittingly to express their conceptual meanings. In this view, perceptual functioning is subordinated to the conceptual. The symbol is a distinctive form of hierarchical relationship forged for referential ends.

EFFECTS OF MEANING ON PERCEPTION OF SYMBOLIC VEHICLE

Werner and Kaplan (1963) cited a few perceptual experiments to show that when a stimulus object becomes a symbolic vehicle its perceptual properties change in accordance with the conception it represents. These experiments had been carried out by Werner and Wapner and their colleagues under the aegis of the sensori-tonic theory of perception. Although much of the sensori-tonic research explored the effects of "extraneous" stimuli on the perceptual location of a central stimulus object, some studies showed that the dynamic or vectorial properties of a stimulus object, affect the perceived location in space of that object itself. Werner and Kaplan cited a subset of such studies that measured apparent eye level with such stimulus objects

as luminescent hands pointing up or down and luminescent printed words like "lowering" and "dropping," "climbing" and "raising" (Kaden, Wapner, & Werner, 1955). The measurable perceptual properties of a stimulus object were shown to change to reflect the vectors or dynamics the object represents. So, when words referring to downward or upward movement are adjusted to apparent eye level, on independent trials, a word referring to upward movement would have to be adjusted lower than one referring to downward movement in order that the word be perceived as being at eye level. In these studies, the luminous perceptual objects are concrete things that are taken to stand for or represent something other than themselves. What they are taken to represent measurably affects their perceptual location.

These perceptual studies showed clearly one aspect of Werner and Kaplan's view of the place of perception in symbolic functioning: the perceptual reshaping of a symbolic vehicle to express its meaning.

JUXTAPOSITION OF THE DIFFERENT VIEWS OF PERCEPTION AND CONCEPTION

The separation of perception and conception as different functions on different levels coexisted in time with the novel idea from the work on symbolization. There is no logical contradiction between the two conceptions unless they are applied to one and the same subject matter. However, the earlier idea persisted in at least one domain that would have been better served by Werner and Kaplan's idea of symbolic functioning—the literature on the Rorschach and other inkblot techniques.

Wernerians and many others continued to treat inkblot responding as a perceptual activity. Other prominent conceptions included the view that inkblot techniques are associative tasks (Lindzey, 1961) and that they are a combination of perception and some higher mental function, e.g., imagination (Piotrowski, 1957). The most influential view was that the inkblot task calls for a combination of perception and association (Rapaport, Gill & Schafer, 1946; Schactel, 1945). Proponents of this view described a dynamic interplay between perception and association that seemed to many to capture the phenomenology of inkblot responding.

DEFICIENCIES OF TRADITIONAL CONCEPTIONS OF INKBLOT RESPONDING

However well these conceptions capture this or that limited feature of the experiential or behavioral aspects of inkblot responding, they each clash with other features. A few of these deficiencies will be outlined briefly.

The perceptual view certainly captures the facts that one has to perceive the blots to respond to them and that a blot can be differently organized perceptually

in different responses. However, when a person actually makes a purely perceptual response to a card, the response is thought of as a failure to respond adequately to the task and is often not even scored. So, descriptions of perceptual properties, e.g., of color, shading, symmetry, shape, are treated as inadequate to the task. The same applies when one responds to the instruction, "Tell me what it looks like," by identifying the stimulus in purely perceptual terms, e.g., "an ink-blot," "a smear of paint." Although responses like these are clearly based on perceptual similarities, they are not adequate to the task.

Treating inkblot responses as perceptual acts fits better with common lay usage of "perception" than with the usage in the academic research literature. The former usage includes all kinds of interpretation and even opinion, as when in an argument, one party says, "That's your perception." Perhaps the term "perception" has interfered with adequate discrimination between the narrower technical significance and the broader everyday meaning. It is the broader significance that encompasses inkblot responding because the person ordinarily takes the task to require interpreting the blot, not merely structuring it perceptually.

Inkblot responding has also been compared to instances of perceptual identification on the basis of visual cues (Exner, Armbruster, Mittman, 1978) or with deliberate mistakes in such identification (Exner, 1986). When one squints at a figure in the distance and announces, "It's Bill," one is communicating literally the identity of the perceived object. If one squinted at an object in the distance and announced, "It's an ink blot," one would be similarly communicating a perceptual identification. If "Bill" turned out to be "Dan" instead, this would have been a mistaken perceptual identification, but calling Card I "a bat" is no more a mistake than calling the Da Vinci painting "Mona Lisa."

Neither are associations adequate responses. If a person responded, "school days" because he or she made inkblots in school this would be an association to the stimulus perceptually identified as an inkblot. It would be quite strange as an answer to the question, "What does it look like?"

The view that inkblot responding requires some more dynamic, two-sided, interplay of perceptual and associative or imaginative activity seems to come closer to the mark. It recognizes that responders usually create a parallelism between their perceptual structuring of the blot and what is named in their response; it is this concordance that is elaborated in the person's answers to the verbal inquiry.

However, this parallelism is not captured by the concept of association by similarity. On one hand, this concept would include too much, e.g., "a smear of paint because that is like an inkblot," "the first card because this one is shaped like it." On the other hand, the concept blinkers the huge dissimilarity between the two dimensional blobs on the card and the objects named in the responses.

As with the earlier history of attempts to reduce various kinds of logical relations to associative processes (Humphrey, 1951; Rapaport, 1951), the special relationship between the perceptual structuring of the blot and the object or scene named in the response cannot be reduced to categories like perception, association or any aggregation of them.

INKBLOT RESPONSES ARE REPRESENTATIONAL ACTS[1]

Inkblot responses can be more adequately described in the terms introduced by Werner and Kaplan in their work on symbolization. The person takes the inkblot as perceptual material out of which a symbolic vehicle is to be formed, a vehicle adequate to stand for the referent as conceived in the response.

The same blot material may be structured differently to portray different referents. Another sensori-tonic experiment (Werner & Wapner, 1954) illustrates such a perceptual change perfectly. An ambiguous luminous figure in a darkroom was adjusted until it appeared to be "straight-ahead" (apparent median plane). Some participants were shown a picture of a mallard duck in flight and were told they would see silhouettes of birds in flight; others were shown a model plane and told they would see silhouettes of flying planes. All participants were then shown the same ambiguous stimulus. As a bird, the stimulus was flying to the left (right) and as an airplane, in the opposite direction. It resulted that, in order to appear to be straight ahead, this stimulus had to be displaced in different directions, to counter the direction of flight of the object depicted.

This study was taken to demonstrate the effect of "a meaning induced set" on perception. It used a traditional psychophysical method adapted to investigate the perception of an egocentric spatial dimension. However, the stimulus, like only a few others in these studies, is not a purely perceptual thing but is apprehended as a depiction of something other than itself, a bird or an airplane. Further, its physiognomic (dynamic) properties as a perceptual object change according to what it is taken to depict. In other words, the stimulus object is apprehended as a symbolic representation according to the conception outlined by Werner and Kaplan.

These are the characteristics of inkblot responding as well. When a person responds to the instructions on an inkblot test by saying, "It's a bat," he or she is taking a blot area to represent something other than itself. The blot is structured so as adequately to depict the referent named, and the referent is envisioned according to the perceptual particularities of the blot. This is not simply a relationship of similarity since one term of the relationship, the restructured blot, is taken to stand for the other, the referent envisioned.

METAPHOR

An inkblot response, like any symbol, fits Cassirer's conception of "radical metaphor" (Cassirer, 1946) in that a perceptual thing is taken to stand for something radically other than itself (Kaplan, 1962). An inkblot response is also a metaphor

[1] The conception summarized here is given fuller treatment in an as yet unpublished paper with Cathleen Crider, with whom the conception was worked out, "Ink blot responses are representational acts." An earlier version of these ideas, from my lectures in the 1970's, is used by Leichtman (1996), who carefully considers some of the issues involved. Treatment of inkblot techniques along these lines is rare in the literature (Harris, 1960), even when the term "representation" is used (Blatt, 1990).

in the narrower conventional sense that it is a verbalization in which one thing is spoken of as though it were another to which it is likened. When a research participant refers to a line as "happy," Wernerians focused on how the line and happiness were construed by the participant so that the line could function as an expressive representation. They did not emphasize the verbal metaphors generated in the course of the inquiry. Similarly, it is easy to overlook the metaphors that are ingredient in the verbalized (Gold, 1987) response to the inkblot. When a person says of Card I on the Rorschach, "It's a bat," the blot is being named metaphorically. The blots function like Peirce's iconic signs (Henle, 1958; Sonneson, 1996) and such representations, like Da Vinci's ***Mona Lisa***, are ordinarily named metaphorically with language literally applying to what they are taken to represent (for current views on iconic representation, see Sonneson, 2001).

Werner and Kaplan's (1963) book was entitled ***Symbol Formation***, emphasizing the formative, creative aspects of symbolic functioning. Indeed, their description of the mutual reshaping of the vehicle of representation and its referent applies well to the representational uses of artistic media.[2] I think it ironic that the creative use of inkblot materials has not been the focus of research into creativity and inkblot tests. Rather, researchers have sought correlations between inkblot scores and various measures of individual differences in creativity, thereby missing the opportunity to attend to the process of creation. The framework outlined by Werner and Kaplan would provide a good beginning point for research on this process.

That framework might also make a contribution to the never-ending wars over the validity of inkblot interpretation. Again, validity studies are dominated by the search for correlations between inkblot scores and the entire universe of important extra-test behaviors—perception, association, creativity, and on and on. That search could be better guided by a clearer, more accurate concept of the kind of behavior sampled by inkblot tests. The focus would then become whether people's ways of representationally interpreting inkblot materials correspond to like interpretations of concrete materials in other spheres, e.g., how they go about understanding the meaning of concrete interactions between people, including patient and therapist. Empirical confirmation of such generalizations would justify clinicians' continued use of inkblot techniques.

The Werner-Kaplan framework, as I have construed it here, might also account for limitations of the generalizability of inkblot interpretation. After all, there are not so many activities in which people name objects or events metaphorically, expressive of an iconic representation. Empirical demonstration of such limitations would cast doubt on the clinical usefulness of inkblot techniques.

[2] Cassirer helped inspire other philosophers like Suzanne Langer (1942, 1953) and Nelson Goodman (1976) who concerned themselves with aesthetic symbols. Goodman's other work on a general theory of symbolism (Goodman, 1978; Goodman & Elgin, 1988; McCormick, 1996) would repay more attention. A related view with respect to science is that of Hesse (1988).

However clinically useful or useless inkblot techniques may be, Werner and Kaplan's approach should turn out to have value not yet tapped for understanding many varieties of interpretation and creative meaning-making. Even such analogues to inkblot performances as seeing pictures in the clouds and reading crystal balls are of interest in their own right. Better psychological understanding of the interpretive processes they involve help further the study of meaning and its generation.

The historical changes in the implementation of developmental concepts that I have mentioned seem to me to belong to a broader movement during the 20th century toward conceptions better suited to constitute meaning as a subject of inquiry. By the latter part of the century discourse analysis, narrative analysis, and so forth, have come to provide alternatives to the domains and methods of perceptual and associationist research characteristic of the 19th century. Partly inspired by Cassirer's philosophy of symbolic forms, the shifts in Werner's theory brought about in collaboration with Kaplan participated in and contributed to this broad shift.

This change illustrates that existing conceptual instruments, e.g., such traditional categories as concept formation, perception, and association, shift in function to deal with novel phenomena only to be superseded by new categories better adapted to those phenomena. Psychological concepts are relative to particular purposes and social contexts, and they may be out of tune with others (Danziger, 1990, 1997). The diverse research enterprises inspired by Werner witnessed the survival of the traditional division of perception and conception alongside a newer idea about symbolic functioning. I have tried to suggest some domains of inquiry that would have benefited and can still benefit from these later conceptions.

REFERENCES

Bauermeister, M. (1964). The effect of body tilt on apparent verticality, apparent body position, and their relation. *Journal of experimental psychology*, 67, 142–147.

Blatt, S. J. (1990). The Rorschach: A test of perception or an evaluation of representation. *Journal of personality assessment*, 55, 394–416.

Boring, E. G. (1942). *Sensation and perception in the history of experimental psychology*. New York: Appleton-Century-Crofts.

Bunge, M. (1969). Metaphysics, Epistemology and Methodology of Levels. In L. L. Whyte, A. G. Wilson, & D. Wilson(eds.) *Hierarchical structures* (pp. 17–28). New York: Elsevier.

Cassirer, E. (1955). *The philosophy of symbolic forms. Vol. 1. Language*. New Haven & London: Yale University Press.

Cassirer, E. (1946). *Language and myth*. (S. K. Langer, trans.). New York: Harpers.

Danziger, K. (1990). *Constructing the subject: Historical origins of psychological research*. Cambridge, England: Cambridge University.

Danziger, K. (1997). *Naming the mind*. London: Sage.

Exner, J. E. (1986). *The Rorschach (2nd ed., Vol. 1)*. NY: Wiley.

Exner, J. E., Armbruster, G. L. & Mittman, B. (1978). The Rorschach response process. *Journal of Personality Assessment*, 42, 27–38.

Feibleman, J. K. (1954). Theory of integrative levels. *British Journal for the Philosophy of Science*, 5, 59–66.
Friedman, H. (1953). Perceptual regression in schizophrenia. *Journal of projective techniques, 17*, 171–185.
Gold, J. M. (1987). The role of verbalization in the Rorschach response process: a review. *Journal of Personality Assessment*, 51, 489–505.
Goodman, N. (1976). *Languages of art. (2nd ed.).* Indianapolis, IN: Hackett. (first published 1968)
Goodman, N. (1978). *Ways of worldmaking*. Indianapolis, IN: Hackett.
Goodman, N. & Elgin, C. Z. (1988). *Reconceptions in philosophy and other arts and sciences*. Indianapolis, IN: Hackett.
Harris, J. G. (1960). Validity: The search for a constant in a universe of variables. In M. A. Rickers-Ovsiankina (Ed.), *Rorschach psychology* (pp. 380–439). NY: Wiley.
Hemmindinger, L. (1953). Perceptual organization and development as reflected in the structure of Rorschach test responses. *Journal of projective techniques, 17*, 162–170.
Hemmendinger, L. (1960). Developmental theory and the Rorschach method. In M. A. Rickers-Ovsiankina (Ed.), *Rorschach psychology* (pp. 58–79). NY: Wiley.
Henle, P. (1958). Metaphor. In P. Henle (Ed.), *Language, thought, and culture* (pp. 173–195). Ann Arbor: University of Michigan.
Hesse, M. (1988). The cognitive claims of metaphor. *The journal of speculative philosophy, 2*, 1–16.
Holtzman, W. H. (1961). *Inkblot perception and personality*. Austin: Hogg Foundation, University of Texas.
Humphrey, G. (1951). *Thinking: An introduction to its experimental psychology*. NY: Wiley.
Kaden, S. E., Wapner, S., and Werner, H. (1955). Studies in physiognomic perception: II. Effect of directional dynamics of pictured objects and of words on the position of the apparent horizon. *Journal of psychology, 39*, 61–70.
Kaplan, B. (1962). Radical metaphor, aesthetic and the origin of language. *Review of Existential Psychology and Psychiatry, 2*, 75–84.
Kaplan, B. (1967). Meditations on genesis. *Human development, 10*, 65–87.
Langer, S. K. (1942). *Philosophy in a New Key: A Study in the Symbolism of Reason, Rite, and Art*. Cambridge, MA: Harvard University.
Langer, S. K. (1953). *Feeling and form.* New York: Scribner.
Leichtman, M. (1996). *The Rorschach: A developmental perspective.* Hillsdale, NJ: The Analytic Press.
Lindzey, G. (1961). *Projective techniques and cross cultural research.* New York: Appleton-Century-Crofts.
McCormick, P. J. (1996). *Starmaking: Realism, anti-realism, and irrealism.* Cambridge, MA: MIT.
Phillips, L. & Smith, J. G. (1953). *Rorschach interpretation: Advanced technique*. NY: Grune & Stratton.
Piotrowski, Z. A. (1957). *Perceptanalysis*. New York: MacMillan.
Rapaport, D. (1951). *Organization and pathology of thought: selected sources*. New York: Columbia University.
Rapaport, D., Gill, M. & Schafer, R. (1946). *Diagnostic psychological testing (Vol. 2).* Chicago: Yearbook.
Schachtel, E. (1945). *Experiential foundations of Rorschach's test*. New York: Basic Books.
Schneirla, T. C. (1949). Levels in the psychological capacities of animals. In R. W. Sellars, V. J. McGill, & M. Farber (Eds.), *Philosophy for the future* (pp. 243–286). New York: Macmillan.
Sonesson, G. (1996). An essay concerning images: From rhetoric to semiotics. *Semiotica*, 109-1/2, 41–140.
Sonesson, G. (2001). Iconicity strikes back: the third generation—or why Eco still is wrong. Plenary speech at the *Sixth Congress of the International Association for Visual Semiotics, Quebec City, Quebec, October 14–21, 2001.* Retrieved December 18, 2002 from http://www.arthist.lu.se/kultsem/sonesson/CV_gs.html
Wapner, S., Werner, H., & Chandler, K. (1951). Experiments on sensori-tonic field theory of perception: I. Effects of extraneous stimulation on the visual perception of verticality. *Journal of experimental psychology*, 42, 341–345.
Werner, H. (1945). Perceptual behavior of brain-injured, mentally defective children: an experimental study by means of the Rorschach technique. *Genetic psychology monographs*, 31, 51–110.
Werner, H. (1948). *Comparative psychology of mental development*. NY: Science Editions.
Werner, H. (1957). The concept of development from a comparative and organismic point of view. In D. B. Harris (Ed.), *The concept of development*. Minneapolis, Mn: University of Minnesota Press.

Werner, H. and Kaplan, B. (1963). *Symbol formation: An organismic developmental approach to language and the expression of thought*. NY: Wiley.

Werner, H. & Wapner, S. (1954). Studies in physiognomic perception: I. Effect of configurational dynamics and meaning-induced sets on the position of the apparent median plane. *Journal of psychology*, 38, 51–65.

Werner, H. & Wapner, S. (1949). Sensory-tonic field theory of perception. *Journal of personality*, 18, 88–107.

Werner, H. & Wapner, S. (1952). Toward a general theory of perception. *Psychological review*, 59, 324–338.

5

RE-THINKING DEVELOPMENT

Bernie Kaplan
in interview with
Ingrid E. Josephs
and
Sunil Bhatia

INGRID:

From fall 1998 to spring 2000 I had—at that time Assistant Professor (Developmental Psychology) in Magdeburg, Germany—the opportunity to work as Feodor-Lynen-Fellow of the Alexander von Humboldt Foundation at Clark University. During this time I was lucky to meet Bernie Kaplan whom I only knew "from the literature" before. Bernie—"officially" retired already for a long time (but that does not mean anything at Clark University's department of psychology)—was eager to discuss ideas and insights about psychological phenomena in general, and developmental issues in particular—in the hallway, in front of the building, on the e-mail, in his home. This was a—nowadays-rare—experience of "doing psychological science" I have always longed for: discussions, at best controversial, burning questions, and careful attempts to answer them. I was so inspired that I even visited Bernie's undergraduate class on dreams. What he tried in class is to make students understand that psychology is an intellectually challenging voyage rather than a "training" to get through.

In collaboration with my friend Sunil Bhatia, a former student of Bernie's, and now Assistant Professor (Human Development) at Connecticut College, the idea was born to interview Bernie about his intellectual traveling through psychology

and beyond, starting with the Heinz Werner era at Clark University. Many tapes were recorded and transcribed, and later onwards the interview discussions continued via e-mail. The topics covered were broad—illuminating the intellectual climate of Clark at Werner's time, and beyond. The topics covered were also very specific—struggling with the question how to conceptualize development within the framework of the orthogenetic principle. The concept of development, crucial for psychology as a whole, and curiously only partly seriously discussed within developmental psychology, is still a miracle. This interview might help to shed some light on this complicated matter and encourage students of psychology, irrespective of their age, to think anew on this challenging concept—in search for novel answers.

SUNIL:

I met Bernie in 1991 when I took my first course with him titled: *Mysteries of Identity*. At that time, I did not comprehend most of what he had to say in that course, but I had this gnawing feeling inside me that he had something important to say. Over the next four years, I continued taking several of his courses, worked as a teaching assistant for his classes, did many independent studies with him and had many engaging conversations about "psychology as a human science" at his home. On one occasion I had a chance to ask Bernie about his role as a teacher. He replied with a typical "Berniesque" expression: "I am here to show you where the wild things are. I am here to show you the stuff of imagination." He had a vision of what "psychology" ought to be and it looked so damn appealing and seductive when I saw it through his eyes.

One of the highlights of my graduate student life at Clark involved those endless seminar meetings in Bernie's large office on the first floor of the building. At that time, it appeared to me that Bernie was "running his own show", operating a small college from his own private den, keeping as much distance as possible from anyone who professed to be a mainstream psychologist. He had approximately three thousand books in his office, about sixty piles of papers consisting of commentaries and book reviews from newspapers, journal articles such as *Mind, Critical Inquiry*, and *Psychoanalytic Review*, and hundreds of other photocopied articles from magazines such as *The Times Literary Supplement*. In addition, there were about sixty piles of student papers, thesis proposals, dissertations that had accumulated over some forty odd years.

Bernie's office was like an organized-disorganized small library or archive that also functioned as an office, a classroom, and a place to smoke cigarettes. It also had a computer, fridge, water cooler, Xerox machine and a small cabin room within the large office. The large rectangular table in the middle had dozens of books, layers of coffee stains that had begun to take the shape of decorative designs (overlapping concentric circles), mixed in with dried-up cigar ashes and food droppings. One had to dodge through these piles of books, chairs, and other scattered materials

and projectiles to reach the other end of the office. The psychology department underwent several changes while I was at Clark, but it seemed Bernie's office had an unchanged look and smell from Werner's era. The disheveled look and the smell of the cigar smoke were ever-present.

In the early 1990s, Bernie had about a dozen graduate students working with him and there were hundreds of undergraduate students who were enrolled in the five to six courses he was teaching at any given time. The combined reading list for all his classes was so huge that the Clark bookstore had a special section on one side of the wall with a title that read "Bernie Kaplan Seminar Books." Although he often presented the "same" material under new titles, those "same" ideas and thoughts frequently had a different resonance and impact in every class. On other occasions, one could predict the topic, story or reference that he was about to touch upon in his classes. His lectures were peppered with the usual, canonical references to Burke, Cassirer, Freud and Werner and dozens of other thinkers from several other disciplines.

In his classes, Bernie was at once a rationalist, a postmodernist, a feminist, a great believer of enlightenment philosophy—and on many occasions he was just the opposite of the person he was talking to. His classes and his writings personified both clarity and contradiction, dazzling brilliance and obscurity, passion and paralysis. He was, and still continues to be, a genuine thinker and a scholar who will cross seven seas, seventy disciplines, and now two hundred websites in search of new knowledge.

Thus, when I was offered the opportunity to interview Bernie about his association with Werner and beyond, I could not resist. Finally, I had my chance to "pin" him down, ask him to elaborate, expand and not be elusive or evasive. So here is the interview, in blurred genres, mixed in with those famous Bernie-footnotes and references.

INGRID AND SUNIL:

Bernie, you are one of the two people who have worked most closely with Heinz Werner, during his stay at Clark. Could you tell us something about the atmosphere at Clark under Werner's aegis, your relationships with Werner during this period, the graduate students who were with you at Clark and came to Clark after you got your Ph.D.?

BERNIE:

I'd be happy to do so. First, let me say that I especially appreciate this kind of format. It promotes what some call *dialogicality*. I like to think of it as exchanging ideas with others. It may well be my peculiarity, but I found it difficult, both in my student years and later on, listening to someone droning on to present his or

her cosmic insight or trivial pursuit of the moment, without inviting questions, comments or criticisms from members of the audience; or even observing that half of the audience was dozing off. I think the current vogue is to call that kind of discourse *monological*. A wonderful word. Sounds so profound.

I should acknowledge that this was not always the case. I could listen almost endlessly to a speaker who—virtually taking the role of others—would pose questions to himself or herself that others might well ask. Or—I think here of both Kurt Lewin, speaking at Brooklyn College, and one of my teachers at Harvard, Roman Jakobson—, whose musicality and choreography in front of an audience were entrancing, irrespective of what they were saying.

I don't know if things have changed that much in the current academy. I have heard reports that there are still some teachers who lecture to dazed and dozing students, ignoring the sounds of snoring. It's a liberating experience when the audience enters actively into the conversation: the opportunity to be questioned, to respond to questions that others are interested in; to be able to digress and reminisce; to use everyday language[1]; to bypass the inane demand to footnote every reference. There is also the luxury, now that I have moved into the vicinity of fourscore, of being able to say what I think without regard for the conventional protocol. I'll be my usual opinionated self. As you listen to me, I hope you will keep in mind the words of La Rochefoucauld: "Old people like to give good advice, as solace for no longer being able to provide bad examples". In any case, thank God for "blurred genres".[2] Allons! Let the questions begin.

INGRID:

How did you get involved with Werner and why did you decide to work within his framework?

BERNIE:

That kind of question is always a difficult one to answer, especially after so many years. Whatever I say *now* about *then* will be inescapably infected by all of my life since then. Freud, somewhere, pointed to the inevitable confabulations and distortions of any autobiography. But since you ask, I'll try. Let the reader beware!

[1] Much to my regret, I've used jargon on many occasions both in speaking and writing and may still do so. A rhetorical gesture, hinting at erudition and often obscuring both what I wanted to say and how I communicated with others. Sometimes, it hides the fact that one is saying nothing! I don't dismiss the importance of technical terms in certain contexts. I do generally find them obfuscating in the Human Sciences.

[2] For law-abiding academicians and demanding publishers, the locus of this notion is in Geertz (1983, pp. 19–35).

When I returned to Brooklyn College in 1945, after my service in the army I found myself chiefly interested in philosophy. I did take some psychology courses—with reputed scholars and teachers: Abe Maslow, Hi Witkin, Daniel Katz, Herb Hyman, Heinz Werner. They were all solid and sometimes entertaining, but I did not find any of them dealing with what I then took to be my vital interests. I guess that few of us, as teachers, take into account where our students are at, although we should recognize by this time that most of them are preoccupied with life, love and the pursuit of happiness, and little taken with our attempts to convey knowledge and wisdom. I know that I didn't think very much about what these eminent psychologists had to say after I left their classes. In any case, none of them really entranced me the way my philosophy courses did.

In philosophy, I was especially impressed by Thelma Lavine, with whom I took a seminar in social philosophy. I recall finding out later on that she had taken her BA. in psychology, her MA. in sociology and her Ph.D. in philosophy. Smart thing to do. Keeps one from being locked into a *déformation professionelle:* getting trapped into a limited set of categories in terms of which we interpret everything in the world. A new version of scholasticism.

Lavine insisted that her students critically examine philosophical theses, with claims to be *sub specie eternitatas*, in the context of historical, economic, political and religious forces in play at the time the theses were propounded. Probably the influence of her teacher, John Dewey,[3] and the philosophy department at Columbia.

It was not merely what was said, but also what were the conditions under which it was said; what and who were the forces in opposition; and whose interests such doctrines served. That was a lesson I don't think I ever forgot, although I often ignored such central considerations in my work as a psychologist. It has been more forcefully brought to my attention through my increasing involvement with the works of Kenneth Burke, that such factors should *never* be ignored, especially in the so-called Human Sciences (Kaplan, 1988a, *Notes on Representation and Interpretation*, mimeo; Kaplan, 1988b, *Psychology and Criticism: Literary and Otherwise*, mimeo).

I probably would have majored exclusively in philosophy, but I was a kid with three siblings, from a poor family. I had to be at least dimly concerned with a job for the future. So I became a double major. I guess I started working with Werner, in part, because I was personally involved at that time with Edith Freund[4] and she was working closely with Werner. Edith had developed the *Word-Context Test*, (H. Werner and E. Kaplan, 1952) and we were both engaged with Werner in the analyses of the protocols.

I did not take myself as *deciding* to work within Werner's framework. That would credit me with far too much knowledge, planning and foresight. I began

[3] See Dewey (1931/1963, pp. 3–12). Dewey always stressed that the august and seemingly world transcending doctrines of philosophers, as well as everyone else, were embedded in cultural and historical contexts and could not be understood outside such contexts. Lavine, his student, agreed.

[4] Edith and I were married in 1948. We separated in the mid 1950s and were divorced in 1957. Edith, working with a childhood friend of mine, Norm Geschwind, later became a leading neuropsychologist.

working with him and was guided by his focus without examining the provenance of his views—the contexts in which they were generated. It's my belief that this is what happens with most students who go on to graduate school. They get attached to some mentor or supervisor for any number of obscure reasons, blindly and blandly adopt the views of that supervisor, and rarely develop their distinctive voices and views in the course of their graduate careers. Some may never do so. The pressure to publish quickly at all costs and without the requisite self-criticism, so much more operative today, militates against reflection and critical thinking.

Although it is always hazardous to reconstruct, decades later, how one regarded another person fifty years ago, I think now that I was impressed with Werner's work in large part because it seemed to have an affinity for the work of Ernst Cassirer, some of whose writings I read before I ever met Werner. Early on, Cassirer was, and still is now, an exemplary figure for me of someone with both knowledge and wisdom. Werner struck me as concerned with different ways of being in the world and different modes of mentation along the lines that Cassirer had pursued in his *An Essay on Man* (*1944*) and in his magnificent *Philosophy of Symbolic Forms* (1923–1929/1953–1957).

I was also impressed with the way in which Werner discussed issues in class. Instead of merely presenting findings, he typically posed and examined the questions that prompted inquiry and was always open to questions from students. He later told me why he proceeded in this way. When he was a *Privatdozent* in Austria, he was paid on the basis of the number of students who attended his classes. He early found out that if you could not keep the students interested, they quickly dropped out of your class, and you were doomed to a life of poverty in the Academy.

Of course, we can now, through all kinds of specious requirements, coerce students into taking our classes, without undue fear that their lack of interest in what we have to say will lead to a reduction in next year's salary. I should mention that I do not oppose valid requirements. I do, however, oppose those artificial and arbitrary requirements that force students into classes in order to insure that certain faculty members have more than one body in their seminar rooms.

SUNIL:

Were there any psychological theories that captivated your interest as an undergraduate student and as a novice graduate student?

BERNIE:

Let me state flatly that the outstanding psychological approach for me then was, and continues to be, psychoanalysis. Recognizing Freud's various limitations and the limitations of the various neo-Freudian theorists, it seemed to me, and still seems to me, among all so-called developmental psychologies, that Freud and his

epigoni recognized the centrality of sexuality, power, desire, and what is loosely called the emotional life in what we loosely call "cognition".

I have no doubt that my views here have been affected by the fact that I was tossed into analysis during the early 1950s and concluded from that experience that psychoanalysis, in the broadest sense, was the best path available for understanding human action and thought.

I would add that psychoanalysts also operated in terms of Heraclitus' ancient dictum that "Strife is the father of all things!" All seeming permanence and stability arose, was maintained, and was dissolved through a conflict of forces. By the way, did you know that David Rapaport wrote an excellent essay on "Psychoanalysis as a Developmental Psychology" for the Werner Festschrift volume, *Perspectives in Psychological Theory* (Kaplan & Wapner, 1963)? From time to time, I also tried to suggest a considerable affiliation between psychoanalysis and the organismic-developmental approach, although I may have stretched things a little bit (see Kaplan, 1967, *Meditations on Genesis*).

More recently, overcoming an aversion to Jungian terminology and his purported mysticism, and through the influence of one of my more outstanding students and scholars to take her degree at Clark—Mary Watkins[5]—, I have also begun to recognize the importance of Jung for the kind of developmental psychology I subscribe to. Jung, of course, did not take the *telos* of development as rationality[6] or adaptation to reality in the way that Piaget, Freud, and even Werner did. Finally, without saying any more about it here, I should mention that another outstanding "developmentalist", not typically taken as a psychologist, who has strongly influenced my thinking and continues to do so: Karl Marx. We all know the influence of some Marxist theses on Vygotsky, Luria and others.

INGRID:

What was the graduate education like in those early days at Clark? Who were the graduate students and faculty when you first came to Clark?

BERNIE:

When I first arrived at Clark, there was not yet a separation of psychology and education. The chair of the department was Vernon Jones, an educational psychologist. A manifest embodiment of what psychoanalysts call an obsessive-compulsive personality. I recall the first meeting we had in his home. He took out a little bell that he tinkled to call us all to attention, and then asked us to

[5] Mary taught at Clark for a while after her doctorate, and was one of the most beloved of teachers. Despite strong student recommendations, she was not hired: insufficient publications in respected journals and a paucity of grants.

[6] For a discussion and criticism of "rationality" as a telos, see, for instance, Nathanson (1985).

go around the room, announcing our names and our specializations. The different people, students and faculty, would recite their names and then boom out "clinical", "personality", "developmental", "experimental", "social", etc. I can still recall his coming to Heinz Werner. Werner was very concise. First, he gave his name. And he then said, "I am a psychologist". No elaborations, no qualifications.

On the faculty: there was Werner and Si Wapner, both of whom I knew from Brooklyn College; John Bell, who specialized in projective techniques; Eliot Rodnick, who had been a research assistant for Clark Hull, but whose heart was in psychoanalysis; Thelma Alper, Dick Lazarus, Gordon Gwinn, another Ph.D. from Yale, and wonderful Tamara Dembo, a model of the persistent and dedicated inquirer.

On a later occasion, there was George Mahl, again one of those Yale Ph.D.s who again was psychoanalytically oriented. Also David Rapaport would come out from Stockbridge from time to time to lecture. And in some magical way Werner managed to persuade the eminent anthropologists, Clyde Kluckhohn and George Peter Murdock to provide series of lectures on anthropology to us. I should not neglect special colloquia with Kurt Goldstein and Konrad Lorenz.[7] Doubtless others, but these are the ones I now recall.

My fellow students: Gene Gollin, who had come from City College and had studied with Kurt Goldstein; Roy Schafer, also originally from City College, who had worked and published with the eminent psychoanalytic theorist, David Rapaport; Jan Bruell, a one-armed refugee from Germany with a passion for direct talk; Bob Pollack, with whom I shared an apartment for a while when I first came to Worcester; Bobbie Baker, eminent ex-theology student, civil libertarian, and lover of great renown, who at one time was a tenant in the apartment rented by Edith and me; Bernie Rosenblatt, at the time an enthusiast for both Marxism and psychoanalysis, who later studied with Anna Freud and became a child analyst; Ricardo Bernardino Morant, scion of an orange-growing family in Spain and the Ralph Lauren of our circle.[8] Later on, there was Joe Church and John Flavell. There were others, but these were the ones whom I now recall as having had the most contact with during my early years at Clark. *It was a fantastic group.*[9]

Four or five of us would get together every week, outside of classes, to discuss the widest range of issues. We would write up papers for each other, study together for Preliminary Exams, mainly free to attend those seminars we wished to attend, although the Preliminary Exams prompted us to sit in on the seminars offered by most of the faculty. The doors of the faculty members were almost always open.

[7] Lorenz was an amazing lecturer, with the talent of a graphic artist. He referred to Heinz as "one of his teachers".

[8] Rick, an excellent student of perception, later went on to become chair of the psychology department at Brandeis.

[9] For me, the importance of my fellow students cannot be overemphasized. I learned as much from them in our informal conversations as I did from most of the faculty members. I would guess that is the case for many graduate students even today.

Heinz once told me, later on, that he would sometimes close his door so that he could snooze and fantasize. There were arguments and discussions in the hallways. There were frequent parties. The place was alive with the sound of music.

One characteristic of the department of the mid 1950s and 1960s should be highlighted. Although there were programs in the department, the boundaries between these programs were porous and easily transgressed. A rigid separation between developmental and clinical psychology was regarded as an aberrance.[10] One could not presume to know anything about development without knowing about so-called pathology. One would not even know what pathology was about without having some tacit of explicit conception of ideal development. Alas, it seemed to me that for many developmental psychologists elsewhere, ideal development involved the acceptance of the status quo, the culturally established and sanctified teloi.

There was one other feature I should mention. Although students, then as now, were subtly or not too subtly pressured to do their theses and dissertations with one or another of the faculty members and to take over that faculty member's views lock, stock and barrel, one was still free to pursue one's own course. For example, even though I was working closely with Werner, I did my doctoral dissertation in terms of concepts taken over principally from Charles Peirce and George Mead.

After I began to teach at Clark, a number of other faculty soon joined the department. I suppose it will be somewhat invidious, but I'll only mention here those with whom I had significant interactions pertaining to developmental psychology and developmental theory. It was not a question of their agreeing with me. It was perhaps more an issue of my enjoyment in discussing issues with them.

Among these new faculty was Hob Crockett, nominally a social psychologist, who was interested in applying developmental theory to interpersonal phenomena. Hob and I wrote a paper on the application of developmental analysis to the formation of impressions of personality. Then, there was my dear colleague and friend, Mort Wiener, a splendid clinician of a behaviorist persuasion, who was willing to debate issues of theory at any time. Over the years, the students would parody the arguments that Mort and I had in the hallways of Clark. Mort and I disagreed about many things, but it never marred our friendship. Perhaps both of us learned the wisdom of Szent-Gyorgy, the Nobel Laureate in chemistry, who reputedly had a sign posted on his office door to the effect "Thank God for those who oppose me, they force me to think."

Somewhat later on, we were fortunate to get the outstanding, developmentally oriented neuropsychologist, Don Stein. And shortly afterward, three highly productive developmental psychologists, Jack Wohlwill, Bill Damon, and, Ina Uzgiris, all of whom contributed enormously to the intellectual atmosphere in the

[10] Since I took *development* to be a normative concept—something to be desired—I took *clinical*, in the broadest sense, to be concerned with all of the factors that militate against development, that lead to what is considered pathology or deviance.

department. I should not overlook Jim Laird, an insightful and provocative social psychologist, and tennis player extraordinaire and Nick Thompson, who provided his own brand of evolutionary psychology and would look for any occasion to make that the central topic of discussion. In the mid 80s, a powerful team of developmentally oriented specialists in child language and discourse analysis—Nancy Budwig and Michael Bamberg—joined the Clark faculty. And then Jim Wertsch came aboard as chairman. Jim's interests were very close to mine and we did some joint teaching together. More recently, Jaan Valsiner has taken on the burdens of the Chairmanship. Given what I take to be his inclinations and predilections, he should do much to restore the vitality of the department that obtained in those good old days.

The graduate students who came to Clark after I got my Ph.D., many of whom I worked with very closely, were also an astounding and energizing group: Margery Bodansky (Franklin), Sybil Speier (Barten),[11] Howie Slepian, Dick Erle, Len Cirillo,[12] Roger M.A. Bibace, Bill Vogel, Sue Hamilton (Vogel), Joe Glick, Joe McFarland, Tom Mulholland, George Rand, Peter Schiller, Sandy Brent, Ogretta Vaughan (McNeill), Bob Shilkret, Al Mehrabian, Tony Hardy,[13] Mel Barton, Mel Schnall, Robert Russell, Gail Hornstein,[14] Nelson Butters, Willis Overton, Jack Demick, John Bateman and many others whom, alas, I cannot recall at the moment. I'm omitting here mention of students of the 90s—that's your generation, Sunil. That too was a remarkable group. You all know how I felt about you. All went on to make outstanding contributions to psychology and/or related disciplines. And most of them did it their way!

A word about the spatial set up in the department. I'm not a passionate advocate of *Feng Shui*, but I must say that the spatial arrangements within the department then were superb for learning, for student-faculty interaction, for gossip, for life. I won't try to describe them here, but they were radically different from the ones that now obtain in the renovated structure faculty and students now inhabit, eliciting images of a hospital ward or a prison.

SUNIL:

You worked with Werner from about 1950 till his death. Could you tell us what you were doing during this period besides working with Werner on *Symbol Formation*?

[11] Sybil Barton and Margery Franklin (1978) took the initiative of compiling and editing many of Werner's articles in their comprehensive two volume work.

[12] A special note about Len Cirillo. He was my student, my colleague, my collaborator and my teacher over many years. I have learned much both from his knowledge and his superb sense of humor.

[13] Tony Hardy (1990) has written a fine work on Cassirer.

[14] Gail is an outstanding historian of psychology; recently, she has published a book on the highly respected and admired therapist, Frieda Fromm-Reichmann.

BERNIE:

Looking back now, in response to your question, I've been flooded by many memories. I recall that, when I first came to Clark, I spent a considerable amount of time reading in the library. I went through all available issues of at least six journals: *Mind, The Philosophical Review, Philosophy and Phenomenological Research, Journal de Psychologie, Archives de Psychologie, Psychologische Forschung* and *The Psychological Review*. I learned then the truth of a remark made later on by Norman Maier. One could always say something new, if one avoided reading anything published more than five years before one wrote.

I finished my MA in 1950, doing a spin off from the *Word-Context Test* with educated and non-educated adults. Then, under an SSRC Fellowship, I spent a year at Harvard in 1951, taking courses with Quine and Jakobson. It was here that I first encountered Noam Chomsky and Morris Halle, who was then Jakobson's TA. I was fortunate to have the opportunity several times later on to visit Jakobson at his home and to have long conversations with him about language and symbolization. Given the enormous range and depth of his knowledge, it was not surprising to me to learn that he was quite familiar with Werner's work. During this hectic period, I suddenly experienced a "nervous breakdown" that threw me into psychoanalysis. Without doubt, one of the most significant periods in my life. It altered most of my beliefs as to how the human mind functions.

Through all of this turmoil, my son, Michael, was born and I managed to complete my doctoral dissertation in 1953. I then went on, God knows how, to teach at Clark. At this point I can't remember the courses that I did teach, although I do recall offering a joint seminar with Werner dealing with various orientations toward symbolization and symbol formation, where I took the role of presenting and defending the views of Ogden and Richards. I there learned how important it is to explore the views of one's opponents as fully as possible, avoiding at all costs turning them into straw men.

In 1955, Edith and I separated and were later divorced. It was a greatly destabilizing period. It's illuminating how one continues to work even in the most distressing times. In 1958, I was invited by Roger Bibace, who was then in charge of clinical training at Worcester State Hospital for predoctoral and postdoctoral interns, to give some lectures on developmental theory to the predocs in the program. It was there that I met the woman who was to become my second wife, Jane St. Clair. At first, Jane and I scarcely got along. I thought she was not sufficiently impressed by my brilliance. She thought I was pompous and almost unintelligible. We finally managed to get beyond these positive assessments.[15] I thought it worthwhile to

[15] Jane was an outstanding clinician, highly admired at Worcester State Hospital for her acuity and clarity. She was an enormous help to me—a sympathetic and intelligent critic. Among other things, she took on the onerous task of preparing the index and bibliography for *Symbol Formation*, a task that neither Heinz nor I were prepared to do. She never completed her degree at TC, refusing to go back and forth for several months to New York after our son, David, was born. I was then too stupid to

include this personal information, because I've learned over the years that one's life outside the academy plays an enormous role in what one thinks about and how one thinks in the academy.

In 1960, I was again invited by Roger Bibace to give a workshop—this time to four post-doctoral interns. One, Bill Vogel, was from Clark; the other three—Ed Zigler, Charlie Spielberger and Martin Braine were outsiders. I'm not sure about Martin's background, but Ed and Charlie had taken their doctorates in the Midwest, and were then dogmatically wedded to the dominant behaviorist ontology and epistemology.

It was a wonderful experience for me—the challenges, the debates, the arguments. I recall writing out 12 lectures in a period of two or three weeks at that time. I just looked over the six of them I still have, and found out that I had spent a considerable time in those lectures discussing Kant, Cassirer's work in *The Philosophy of Symbolic Forms*, Pepper's *World Hypotheses* and his thesis about root metaphors, and various views concerning the philosophy of science. Relatively little about Werner and the organismic-developmental approach. I've been told by Ed Zigler, now Sterling Professor Emeritus of Psychology at Yale, that I converted him from behaviorism to developmentalism. I don't know of any effect on the others.

In 1960, chiefly under the influence of Cassirer, I did give a paper "Radical Metaphor, Aesthetic and the Origin of Language"—at an APA symposium on "Metaphor". When I think of it now, I realize that this paper sketched out my program of research for the next several decades. I was going to examine figurative language and thought in all of human behavior.

After Werner's death, I went on one of those kinds of circuits promoting aspects of Symbol Formation. I must have gone to ten or twelve schools of architecture. I also spent a quarter as Visiting Professor at The University of Chicago, where I offered a joint seminar with Larry Kohlberg on developmental theory and also offered a seminar on metaphor. It was in the seminar with Kohlberg that I tried to show him and his students that his schema of stages of moral development conformed to the orthogenetic principle; and that, furthermore, his empirical findings based on his travels around the world were irrelevant to his formulations. It was also at Chicago that I met Shep White, who was to become one of outstanding developmental psychologists in America. When Larry and Shep moved to Harvard, the three of us were in frequent contact for the next twenty odd years. Shep and I remained in close contact after Larry died. Some time in the early 70s, I was Visiting Professor at Harvard where I offered one graduate seminar on developmental theories and another on symbolism and metaphor.

realize the absolute priority of the bond between mother and baby that brooks no interference. Beyond that Jane had no desire to go into clinical practice, holding to the strange view that one had no business charging people in pain or distress for trying to help them. I should mention here that my daughter, Ruth, who had started out as a Visual and Performing Arts major and somehow wound up taking a doctorate in Chemistry, took after her mother. Once she had her first baby, he was and is the absolute priority.

This may have promoted a Clark-Harvard alliance. Events are a little too hazy for me now, but I became involved in deep discussions with one of Larry Kohlberg's students in the late seventies. She was engaged in challenging Larry's views on moral development. And she finally did so in her outstanding work, *In a Different Voice*. Carol Gilligan and I were subsequently to arrange a Clark-Harvard seminar that wore out the highways between Worcester and Cambridge. I think it was a great experience for the Clark graduate students who participated.

Shortly after I returned from Chicago, I was invited to give a series of lectures at Antioch, where I offered seminars on developmental theory and interpretation of dreams. I learned much from the sojourn at Antioch about student-teacher relationships. The faculty and students were really in a collegial relationship and outstanding students with certain areas of expertise were allowed to teach courses. I exploited that knowledge later on at Clark.

Several years after this travelogue, during the turmoil concerning the perpetuation of the Viet Nam war, when the students were deeply involved in the current situation, and were rebelling against what they took to be the sterility of the academy, the faculty adopted the president's proposal to make me *Director of Academic Innovation*.[16] This post allowed me to institute whatever courses I wished and to grant credit for these courses. In that context, I instituted 40 courses (each usually with 7–10 students) where the students chose the topic, worked collaboratively and were expected to write a joint book for credit. This lasted about 2 years, when there was protest from the bursar and the registrar.

During this period, I was also appointed Clark's first University Professor, giving me the freedom to offer whatever courses I wished. At the same time, I was also given adjunct professorship appointments in Philosophy, English and Comparative Literature.

INGRID:

Can you describe or characterize your experiences during the period that you collaborated with Werner on *Symbol Formation*?

BERNIE:

I've already mentioned that I was Werner's student before I became his colleague and collaborator. This is rarely an easy position to occupy, as you, Sunil, must know. Oedipal conflicts undoubtedly entered in. There was no question but that Werner was the prime mover in the writing of *Symbol Formation* and that I

[16] It was here that I learned never to trust a faculty in a panic. The faculty had spent 3 hours debating whether students should be allowed to participate in faculty meetings, and decided they could if they remained silent. They took about 3 minutes to grant me powers that one should never grant to a single faculty member.

usually subordinated myself to his prejudices and inclinations in the work. Had I been the principal instigator, there would doubtless have been much greater reflection on, and inclusion of, psychoanalytic and Jungian work on symbol formation, probably resulting in a near interminable and finally collapsed effort.

Beyond these differences, there were a few points on which I disagreed with Werner substantively, mainly, of course, with a kind of deference one owes to one's teachers and elders. Having been exposed to Franz Boas, Ruth Benedict, Paul Radin, Leslie White and other anthropologists in my readings, and having one brother,[17] a Professor of Anthropology, who had studied at Chicago with Robert Redfield and Sol Tax, I remember being taken back by Werner's recurrent references to primitive groups and to primitive minds. It is not that I contested the idea of primitive mental functioning—I was aware of enough of it in my own mental activity. But I took it for granted that such functioning was not the province of any group but was manifested in *everyone under certain conditions.*

To be sure, Werner acknowledged that point. Indeed, he recognized with others, that, *in actual life*, "regressions to primitive modes of functioning" were inevitable and frequent; moreover, he took such "regressions"—dedifferentiation and the collapse of hierarchic integration"—as often necessary for developmental advances. As you may know, the same point was made by Ernst Kris, in his discussion of "regression in the service of the ego". In this sense, Werner allowed for certain positive values for (temporary) primitivity of functioning. One step backward in order to take two steps forward.

Despite this, I felt that the thrust of Werner's work was to stress "primitive functioning" among children, members of non-literate societies, and individuals manifesting some kind of "pathology". If I get a chance, I'll talk about this later, taking "primitivity" not as a characterization of forms alone, whether of perception, action, or thought, but as a form-function, means-ends relation.

SUNIL:

Why don't you talk about it now?

BERNIE:

OK, but before I do so, I'd like to make a few observations. As we know or should know, almost all terms (except perhaps for the so-called syncategorematic ones) are subject to "spin". They are given different meanings by different groups in different cultural contexts. That's a manifestation of the "politics of representation".

[17] My other brother was a Professor of English. There were doubtless sibling rivalries. This may have had something to do with my interests in both anthropology and literature, and my very strong belief that a psychology that ignores anthropology and literature is truncated in the extreme—a dull gray that totally ignores life's golden tree (Goethe).

We have seen this with regard to the term "liberal", turned into a curse word by Ronald Reagan. Wittgenstein was surely right when he said that one has to fight against the bewitchment of language.

Now, "primitive" and its cousins have been given different meanings and different valuations in different historical-cultural contexts. I wish I had the knowledge to discuss these fully here. In lieu of such expert knowledge, I'll rely on others (Kroeber and Kluckhohn, 1963; Diamond, 1960; Harris, 1968; Geertz, 1973, 1983) who have treated the issue in some depth.

Let me first start with a historical sketch, with the recognition that all such sketches are open to contestation. We may all be aware, to varying degrees, that in ancient times (*in illo tempore* as Eliade likes to put it), some took the order of change as going from the most sublime, through a series of stages, to the most degenerate (Hesiod's Theogony; the Yugas, going from Satya Yuga to Kali Yuga; the Fall out of Paradise), in some cases, with a return to the beginning and the eternal recurrence of the cycles. For many centuries, it was assumed that the best of times ("most advanced") came first, and then it was downhill all the way to the worst of times. I would sometimes remind my students that we live in the Kali Yuga, the worst of times.

It was not until the Renaissance that this order was challenged by some—I think of Francis Bacon here—, even as others, the Humanists, were still going back to the ancients as the loci of wisdom. Coupled with an idea of progress, there was a total inversion. In the beginning was the "primitive" in at least two senses: the first in time and, like a young child, ignorant of the world and limited in both knowledge and competence.

Overlapping these views, there was also a very famous and pervasive doctrine: *The Great Chain of Being* (see Lovejoy, 1936). The cosmos was taken to be structured in terms of degrees of actualization from prime matter to pure form (God). This Chain was not initially conceived as an unfolding in time. But in the 18th century, there was what Lovejoy (1936, pp. 242–287) has called "the temporalization of the Great Chain of Being". What did this temporalization entail? The earliest and most primitive came first in time and was progressively superseded by the more advanced manifestations of the Chain of Being. We had the idea of progress, even if not yet the ideal of progress.

Once this form of change over time was established, a number of series was introduced tracing the movement from the primitive to the advanced: not only from the child to the sophisticated, mature, civilized adult, but from the technologically backward, illiterate peoples of the world to the technologically advanced, progress seeking, literate people (of the West); from the crazy and the mad (the psychotic, the neurotic) to the normal adult, "socialized and adapted to reality".

In all of these cases it was assumed that the most primitive was not able to establish or maintain a sharp distinction between self and other; was not able to establish or maintain a separation of emotion from thinking; was not able to establish or maintain a transcendence of the concrete and the local and attain a grasp of the abstract and universal in a rational manner. It should come as no

surprise that an order going from girls/women to boys/men was assimilated to the same schema in many quarters. I'll leave it up to you to judge how many past and present "developmental theories" operate(d) within this framework, although the feminist movement has rendered the presumed "developmental progression" from female to male not only politically incorrect but clearly without the slightest grounds.[18]

Having said all of this, let me go to my conception of "primitivity" As you may know, I've elsewhere (Kaplan, 1984, *Development: Psychological and Otherwise*) asserted that for me there is no development *per se* or development *simpliciter*. Development is always considered with respect to a telos or teloi—ends, goals or values. Given different ends or goals, what we take to be development will differ, and what we take to be primitive levels of functioning will differ. Are we all not aware of that?

If my telos is to be an excellent, well-developed, soccer player, I will sooner or later become aware, or be made aware, of the fact that certain of my performances are primitive relative to the desired goal. If my telos is to be an outstanding (well-*developed*) pianist, I will sooner or later be made aware that certain of my performance are primitive relative to that desired goal. If I seek to be an outstanding logician, I will sooner or later be made aware that certain of my performances are primitive relative to the desired goal. We can go on and on.

Now, it seems obvious, at least to me, that we call different means, devices or actions *primitive* only in relation to tacit or explicit goals or teloi. What may be taken as primitive with respect to one telos may be regarded as highly advanced with regard to a different telos. Thus, if we take some individual to be trying to communicate with us in a clear, articulate culturally accepted fashion, and we get a word-salad, we take such an expression to be primitive. On the other hand, if we take the agent to be oriented toward disturbing the received rules of the grammar and lexicon of a society in the process of creating a new form of fiction, word-salads, neologisms, syntactic aberrancies, etc. may well be taken as advanced. In other words, to borrow Burke's formulation, unless we know the *agent*, the agent's *orientation*, goals or purposes, the *scene* or situation in which the agent acts, we cannot adequately characterize the *act*. An assessment or evaluation of "primitivity" of performance, without these larger considerations is always questionable! In one of the many meanings of *organicism*,[19] this is what I believe an organismic approach demands.

Let's look at the term/concept "primitivity" from another angle. As we know, with regard to *words of power*, polysemy reigns. As I've just said, such terms are endowed with different meanings by different groups. This is a natural concomitant

[18] In this connection, see Harding and Hintikka (1983).

[19] I have discussed some of the many meanings of organicism in my paper, *Meditations on Genesis* (Kaplan 1967). For a thorough analysis of this "root metaphor" as well as the root metaphor of *mechanism*, see Pepper (1942). For an illuminating description of the *Mechanization of the World Picture*, see Dijksterhuis (1986).

of language use in society. "Primitive" and its related terms are clearly among such words of power. It is, therefore, essential, that one grasp the meaning(s) attributed to the term by different theorists.

Beyond that, it is also reasonably clear that the term "primitive" is rarely self-applied by a group or individual. That term is characteristically used by one group or individual to characterize other groups or individuals. There have been occasions in history when "primitive", because of its linkage to "natural", unconstrained by artifice, has been a term of approval (see Lovejoy, 1948/1960). In recent times, it has been, more typically, a term of derogation, used to stigmatize an "outgroup" or other. A group using the term has taken its own cultural practices to be the model or norm for what it is to be truly human, and has characterized those who deviate from such practices as "primitive".[20]

INGRID:

If "primitive" is a term with so many meanings, what about the term "culture" that everyone uses nowadays?

BERNIE:

I'm glad you asked that question. It may be noted that the meanings attributed to the term "culture" are very closely tied up with disputes about "primitivity". As variegated and diverse as are the meanings of "primitive", the term "culture" seems to have a greater "semantic fecundity", to borrow an expression from Lovejoy. It's fascinating to examine the introduction of the term culture and its cognates, and to watch how different meanings and valuations were given to the term by different theorists in different contexts (see here especially the works of Raymond Williams (1958) and Marvin Harris (1968).[21]

It might be useful to display some of the definitions of *culture* to highlight the contrast between culture as an ideal to be attained and culture as an ostensibly neutral characterization of a group's way of life. For Matthew Arnold (1869), culture is "an ideal of human perfection ... increased sweetness, increased light, increased life, increased sympathy". One has to aspire to become cultured. We can see here a link between culture and civilization.

[20] This kind of operation undercuts many so-called comparative studies. In such undertakings, there must be some standard, some common set of categories for assessing the phenomena compared. Ideally, there would be culture-transcending standards, so that there is, so to speak, a level playing field. But, typically, the standards for comparison have been taken from the more dominant group, with the upshot that non-dominant groups are shown to deviate, in terms of excess or defect, from the standards of that dominant group, such deviation taken to warrant the epithet, primitive (see Diamond , 1960, pp. vii–xix, pp. 170–193).

[21] A thorough examination of the meanings of the term culture is once more needed today, where undefined and unspecified concepts of culture are often invoked as mantras.

In contrast, there is Edward Tylor, often regarded as the father of anthropology. In his book, *Primitive Culture*, p. 1, Tylor remarks: "*Culture or Civilization* taken in its wide ethnographic sense is that complex whole which includes knowledge, belief, art, law, morals, customs, and any other capabilities and habits acquired by man as a member of society".

This is not too far removed from the view of Franz Boas. In his classic work, *The Mind of Primitive Man* (1911/1963), Boas states (p. 149): "Culture may be defined as the totality of the mental and physical reactions and activities that characterize the behavior of the individuals composing a social group collectively and individually in relation to their natural environment, to other groups, to members of the group itself and of each individual to himself. It also includes the products of these activities and their role in the life of the groups". Boas stresses: "The mere enumeration of these various aspects of life, however, does not constitute culture. *It is more, for its elements are not independent, they have a structure*" (my emphasis).

Now, the ostensibly neutral conceptions of "culture" were adumbrated by such conceptions as *The Spirit of the Laws* (Montesquieu) and the *Spirit of a People* (Volksgeist). This spirit was assigned existence and power and was taken to be able to permeate every activity of the group and to distinguish one group (people, Volk) from others. This notion, I believe, still plays an important role in conceptions of national character or national identity.[22] Thus a supposed *National Spirit* would ostensibly manifest itself in every sphere of life in which the people were engaged.

This, I believe, was the view Werner had of "culture". Werner insists or asserts that if ethnopsychology—ostensibly the psychology of groups—is to be taken as a field of developmental psychology, it must take the group "as an organically developing totality" (1948, p. 6). I must admit that it is not clear what this expression means. Nor is it at all clear to me why this "necessity" is asserted.

One may maintain that only if a certain aggregation of individuals manifest an interdependence of parts and an integration of these parts under some unity principle will they be considered a folk group. In other words, one would have to start with the requirement for unity and take as a people or a folk only those who manifest that unity. Alas, as we know, if one posits a spiritual unity pervading the lives of a group, one will always be able to *interpret* everything that occurs in the actions and productions of the group in terms of this unity. A kind of "hermeneutic circle". As you may recall, Sunil, I've tried to demonstrate this process in several "parlor games".

It is important to recognize that the neutralist definition of culture easily entered into cultural relativism, in which it was verboten, at least among anthropologists, to condemn any society from outside. Redfield, in his *Primitive World and its Transformations*, remarked on this phenomenon when he pointed out how difficult it was for the anthropologists of the 40s (it still is) to condemn Nazi Germany.

[22] Allow me the parental pride of mentioning that my son, David, a Professor of Geography, co-edited a book on *Nested Identities* (Herb and Kaplan, 1999) and now edits a journal entitled *National Identities*.

Following the emotive theory of ethics of the Logical Positivists, all one might say is: Ugh, I don't like what they're doing, but who am I to say that they're evil?

As we know, cultural relativism is rampant in the universities today. I make no brief for an absolute morality, but I do think that students should not be led to conclude from the variety of empirical studies that the issue of morality can be settled to a recognition that different societies differ in many respects with regard to mores, customs, laws.

SUNIL:

You are credited with many with having introduced the *Orthogenetic Principle.* Hadn't Werner already formulated that principle in his *Comparative Psychology of Mental Development*? In what ways did you differ from the conception of development in that work?

BERNIE:

There is no question that the view that development entails differentiation and hierarchic integration was stated by Werner in CPMD (pp. 40f.). And, as Werner remarks, this conception of development is already present in Goethe's *Metamorphosis*, where development is equated, in its fulfillment, with *perfection.* One might go further and hold that this conception of Development was already operative in *The Great Chain of Being* (Lovejoy, 1936) where the *telos* of development was to be maximally *diverse* and yet maximally *unitary and unified.* In other words, to approximate God or pure form. Of course, no human is God, and so full development can never be achieved, but is always beyond.

What I tried to do is distinguish development as a postulated or stipulated concept (see Northrop, 1947) from development as an empirically obtained conclusion from partial or impartial observation of facts in the *Book of Nature.*[23]

Now, orthogenesis as an ideal form occurs nowhere in actuality. In the lives of organisms, especially in the lives of human beings, one does not see an uninterrupted movement toward increasing differentiation and hierarchic integration. Time and again, inner or outer circumstances retard, derail, dis-integrate such an uninterrupted movement. Like Freud, Werner fully recognized this point, and thus introduced notions of formal regression, in which more primitive modes of functioning gained dominance. Werner also pointed to the fact that such "regression" was often necessary for a new developmental advance. One had to partially dissolve the existing organization if one were to move ahead. We are surely aware of this phenomenon in our own lives, where our existing and ritualized modes of

[23] Richard Rorty (1979) is only one of the more recent scholars to criticize the assumption that we copy the Book of Nature. One can find such arguments among the Romantics in the 19th Century (see Meyer Abrams, 1953, 1971; Harold Bloom, 1970).

action and thought block us from dealing with new circumstances and new contexts. Burke, following Veblen and Dewey has referred to such rigidified structures as a trained incapacity or an occupational psychosis.

It should be appreciated that some concept of orthogenesis had been around for a considerable length of time. Even Darwin seemed to accept it for a while. However, it was quickly challenged by evolutionists and anthropologists. Actual evolution or history was not orthogenetic. I fully recognized that point, and agreed with the arguments. What I tried to do is formulate orthogenesis not as a description of what occurred, but rather as an "ideal type" or a law that was never realized in actuality, much like the first law of motion. Presumed to be operative under ideal circumstances, there were always factors that precluded or interfered with its full actualization. The empirical problem then becomes one of determining those factors, which, lead to stasis, retardation, regressions, derailments, etc. The same issue holds, it seems to me, with regard to Aristotelian and Maslowian conception of self-actualization.

INGRID:

What do you take to be the major outcomes or insights deriving from this collaboration with Werner?

BERNIE:

It was through the process of collaboration that I fully realized that development for me was what F.C.S Northrop (1947) characterized as a concept by postulation. It was a *form* or *schema* for selecting, interpreting and organizing phenomena. In other words, *development* was not an object in the Book of Nature, but was a way of looking at and describing events, a way of organizing the manifold of phenomena.

Once that realization occurred, I also became aware that development is one form for the characterization of changes, a form that one might try to apply everywhere, with varying success. The ability to apply that form to, let us say, the life histories of individuals (ontogenesis), or a reconstructed history of species (phylogenesis) does not constitute *evidence* for the form. It merely shows that the form that one has delineated can be applied to these domains. How useful, productive or illuminating such an application is another question. Here enters the proverbial question "So what?"

Once this status was articulated, it was clear that so-called *formal* or *genetic parallelism* with regard to diverse domains was logically implicated. Although far vaguer than the concept of *isomorphism* (a Latinate version of formal parallelism), which is invoked when the same mathematical system applies to diverse domains, it was of the same character. Here again, where and when formal parallelism is

asserted, one may ask for the value of noting such parallelism. What does it enable one to do?

Now given that the orthogenetic principle is postulational and normative, I realized that nothing *necessitated* the orthogenetic principle as the definition of development. One might stipulate other principles. Each one was likely to provide insight and also induce a certain blindness. I also realized that the orthogenetic principle was deeply rooted in history, being in some way a variant of *The Great Chain of Being* (see Lovejoy, 1936). It basically took for granted that a combination of analysis and synthesis marked or should mark what we take to be development: the correlative operations of splitting/separating and integrating/uniting.

One further point. I have, on a number of occasions, remarked that the orthogenetic principle can be applied as well to the development of a pickpocket or a pimp as it can to the development of a chess master or a statesman. The principle specifies no moral or ethical telos, no content.

What would happen, for instance, if love or Agape were stipulated as the telos of development? Or if "becoming a person" (see Carithers, Collins, & Lukes, *The Category of The Person*, 1985) was taken as the telos? Can the orthogenetic principle be usefully applied with such teloi? I haven't worked this out for myself as yet, but I realize that for millions in the world, either or both of these are the implicit or explicit goals of existence.[24]

SUNIL:

When you began to teach about developmental theories at Clark did you focus on organismic-developmental theory?

BERNIE:

No. Heinz presented that orientation in his own seminars. When I offered seminars on developmental theories after Werner's death, I was inclined to join the students in critically examining the views of Piaget, Dewey, Baldwin, Marx, Hegel, Aristotle and others. It was often a great surprise to the students to come to the realization that very important views concerning development had been presented for several thousand years.

However, there is little doubt in my mind that Werner's influence was operative throughout. Only half-facetiously, I used to say that I was a developmentalist because the concept of development as I envisaged it working with Werner allowed me to look at anything from a developmental point of view—the development of

[24] Bertrand Russell, who may well be taken as the exemplar of those oriented toward Rationality, remarked on one occasion, where he observed how A. N. Whitehead took care of his wife when she lapsed into a severe depression, that nothing really mattered except love. One might consider here the disagreement between Larry Kohlberg and Carol Gilligan concerning the teloi of moral development.

law, the development of religion, the development of a thesis, the development of the family, the development of a percept, the development of baseball, even if it turned out that such a mode of observation was of marginal value for me with regard to specific domains e.g., the development of art.

INGRID:

Which issues did you think that Werner did not address but that you thought then or think now should have been addressed?

BERNIE:

An excellent question! Concerned mainly with the application of the form of development to diverse domains, Werner greatly slighted or skirted the equally deep issue of "causality" (see Cassirer, *The Logic of the Humanities*, 1960, Chapter 4, pp. 157–181). Why did this individual or this group manifest what Werner regarded as a primitive level of mentality? This is basically a question of "Why", not merely of "What"! An attempt at explanation, not merely description.

Werner acknowledged that there was a difference in the "determinants" of the ostensible primitivity of a young child in a technologically advanced society and the ostensible primitivity of an adult in a non-literate, technologically limited, society, but did not fully pursue a close examination of these determinants or draw out the full significance of such determinants for a discussion of comparative development. It is surely not enough to suggest that the causes of this or that manifestation of primitivity are due to the fact that the Agent is a young child, a brain-damaged individual, a drug intoxicated artist or a schizophrenic.

Again, despite his advocacy of an organismic approach to cultures (in part, derived from Herder), Werner did not take into account the range and variety of cultural constituents to characterize the mentality of any group: law, religion, recreation, etc. (see Kluckhohn [1962] in Tax, pp. 304–320).

In all fairness to Werner, anyone who writes a book leaves out an enormous amount of relevant material. It once dawned on me that the organismic root metaphor, involving a doctrine of *internal relations* would, theoretically, be unable to examine anything without examining everything (see Lovejoy, 1936, p. 10). Fortunately, organicists become elementarists when they undertake research. Likewise, enthusiasts for contextualism become decontextualists in their research undertakings.[25]

[25] It is apparent that Heinz Werner was widely appreciated and admired by outstanding scholars in various disciplines. For his Festschrift (Kaplan & Wapner, 1963), the contributors included Silvano Arieti, Solomon Asch, Jerome Bruner, George Klein, Tamara Dembo, Kurt Goldstein, Roman Jakobson, Norman Maier, Gardner Murphy, Ted Schneirla, Abe Maslow, David Rapaport, Martin Scheerer and Hi Witkin.

SUNIL:

You worked with Werner to articulate the organismic-developmental approach. You then decided to introduce a different orientation that you called *Genetic Dramatism* or G-D. What prompted you to do so? Why did you choose that strange title?

BERNIE:

First, I had questions about the ways in which others who claimed to march under the banner of Werner represented the organismic-developmental position. But that was really secondary. Doubtless influenced by Marx'11th thesis on Feuerbach, I was no longer interested in focussing on taxonomy or classification of actions. No longer interested merely in interpreting the world, I was eager to help change it.

But changing some state of affairs to another state of affairs involves a conception of development in my sense. So, I still wanted to have some reference to "genesis" or development in my orientation. And I wanted to acknowledge the central role of Kenneth Burke's *Dramatistic* perspective in my current thinking. As to the choice of the name, it was really done tongue in cheek. I liked the irony and black humor of playing with the sacrilegious formula: *The Perspective of G-D.* The irony, of course, stems from the fact that, in the G-D orientation, there could not be an omniperspective, a perspective of G-D.

Let me elaborate why I chose *Genetic-Dramatism.* As I said, I wanted to emphasize the central role for me of the writings of Kenneth Burke.[26] I had been acquainted with some of Burke's writings before I ever knew about Werner. Burke, exploiting the most elementary questions with regard to representations and interpretations of events, had foregrounded the position that one ought to ask about *any* representation or interpretation of action or production: Who did it or made it, (the *agent*); where and when did they do it or make it, (the *scene*); for what purpose did they do it or make it (the *end, goal* or *telos*); what instrumentalities or "mediational" devices did they use to do it or make it (the *means*).

Beyond that, Burke also recognized representations of events in the world were typically *symbolic actions* in which speakers and writers were trying to influence others, to gain their adherence to some *cause* or some *orientation* to the world. This held not only for politicians on the national scene, but for you and me in many of our interactions. It also held for scholars in the academy who proposed "theories" about

[26] Burke, who seems to be scarcely known among *academic* psychologists, has had an enormous and acknowledged impact on highly reputed scholars in many different disciplines: Dell Hymes, anthropologist and sociolinguist, Clifford Geertz, anthropologist; Erving Goffman, sociologist; Frank Lentricchia, literary critic; Hayden White, historian: Marshall Edelman, psychoanalyst, W.H. Auden and Howard Nemerov, poets, to mention only a few. Clark and Holquist (1984, cont. p. 7) note the strong affinities between the thought of Burke and Bakhtin. Maybe, one of these days, American psychologists, now enamored with Bakhtin, will take the time to turn to Burke.

the way things are. They (we), too, are engaged in attempts to gain the "adherence of others"[27] to our proposed ways of describing and explaining the world.

Let me restate that in a somewhat different way. For Burke, one engages in rhetorical activity not only to persuade others, but also to secure the identification of others with us and our causes, and, to a great extent, to direct and regulate their actions. We are likely to see this process in operation in what we take as the political domain; we might even see it in operation in the interpersonal relations of ourselves and others. We may not so easily see it in operation in our undertakings as scholars or teachers in a putative ivory tower. As you know, Sunil, I've written about this in my essay, *Basking in Burke* (Kaplan, 1985) and also in my *Notes on Representation and Interpretation* and *Psychology and Criticism: Literary and Otherwise*.[28]

Burke convinced me that all theories are injunctions to view the world in certain ways, using certain categories and concepts. They are devices to persuade others and perhaps the theorist himself/herself to see phenomena in certain ways, in terms of certain categories and concepts. Each theory provides certain insights and promotes certain blindness. Just as the varied actions we carry out with regard to "objects" in the world reveal different features of such objects, so do different approaches, orientations or perspectives reveal different features of what there is for us. At the same time, each blinds us to other features, not dreamt of in our inevitably parochial philosophies.

It seems obvious to me that different orientations have different consequences for our actions in the world. The Cartesian orientation that led to the view of non-humans as machines, permitted, for centuries, the abuse of "soulless animals". It has been argued by some that an organismic-developmental approach could easily lead to a depreciation of others, and may have served as a kind of justification for attempts to subordinate and control "lesser breeds outside the Law". I have contested that view, but I can well see how someone would reach that position. It has led me to believe that one should always consider and reflect on the consequences of different theories, including one's own. Alas, one cannot often see the unintended consequences.

INGRID:

What do you envisage as the future of Genetic-Dramatism?

BERNIE:

I'm not into prophecy, but I think that the substance of what I have called Genetic-Dramatism will be around for a long time, even though it will surely not

[27] I was tempted to plagiarize this charming phrase from Chaim Perelman (1982) but conscience doth make cowards of us all.

[28] For those who might become interested in Burke, references to some of his major works are included in the bibliography.

go by that name. To adapt an observation from the notorious General MacArthur in another context, "Old theories never die, they just fade away". I might add, with a proper use of cosmetics and a novel terminology, they may once again take on a lustrous sheen; old wine may once again be poured into new bottles.

As human beings, we are all concerned with the way things ought to be. We take "development" in one of its uses as a *normative* notion. We want our children to develop, and we don't mean merely that we want them to change! We want our students to develop and, again, we don't mean merely that we want them to change. We want our clients to develop, and again not merely to change! One of my concerns with much of current developmental psychology is that it seeks willy-nilly to avoid the normative import of this aspect of development, focussing mainly on the causes or determinants of what is taken to occur.

Now, it is quite clear, at least to me, that the teloi that are posited by different individuals and groups will vary considerably, and often be issues of conflict and contestation. This may not be the case for teloi in established professions or crafts, but it will surely be the case when one poses the questions: How ought one to live? How should societies be organized? What shall we take to be the Summum Bonum? It is inevitable that conflicts will persist in all of these areas. And such conflicts will prompt a wide range of "theories".

It may be worthwhile at this point to iterate my view that a theory is a kind of imperative to look at the world in certain ways and in certain terms. Any such perspective yields certain insights but also promotes certain blindness. It characteristically entails the introduction of what Burke calls a "terministic screen"—the lexical and syntactic categories in terms of which one talks about phenomena in the world.

Given that assumption, one might think the more theories the better; or to put it in another way, a theory is a metaphor (root metaphor) subtly transformed into a model, and such a model is sometimes taken as reflecting the structure of reality whereas it works to impose a certain structure on the field of experience. Just as one learns more and more about an object in terms of diverse transactions with that object, so one learns more and more about the world as one engages it with different metaphors or models. In some respects, Burke's advocacy of *Perspective by Incongruity* (i.e., metaphor)[29] anticipates the work of Lakoff and others, who have stressed the mental activity is fundamentally metaphorical.

With this insight in mind, I have come to the conclusion that the battle between organicists and mechanists that seemed to preoccupy Werner was overblown, although understandable at the time. Given an orientation, one may become an organicist; another a mechanist. It is not that one reveals reality better than the other. The advocates are led to structure reality differently, allowing exponents of

[29] Burke is a strong advocate of what has come to be called *perspectivism*. In relatively modern times, Nietzsche is typically taken as among the strongest proponents of that doctrine, and Burke relies heavily on Nietzsche. To be sure, one can easily see the doctrine of perspectivism in Protagoras' dictum: "Man is the measure of all things, of things that are that they are and of things that are not that they are not" (see Nehemas, 1985; Danto, 1965; Bernstein, 1983).

each to see things the other does not and to be blind to phenomena the other is capable of witnessing. As Burke puts it, every representation of what there is will "reflect, select, deflect". It will also neglect, reject, and project.

I might note, finally, that once one becomes ensorcelled by or enamored of a form or schema, one can find manifestations or exemplifications—embodiments—of that form or schema everywhere. Since others with different schemata are blind to our insights, this leads inevitably to conflicts in interpretation: something we are all heir to (see Ricoeur, 1974; Kermode, 1985).

In my initial association with Werner I was too busy working within the paradigm to reflect on it. That's what happens with regard to projects of action—to borrow this term from Schütz: If one is already on board the ship, one doesn't ask why the voyage was ever undertaken. After Werner's death I did seek to advance specific criticisms of the organismic-developmental approach—my article for the Arieti Handbook (Kaplan, 1966), and my essay on *Strife of Systems* (Kaplan, 1992).

SUNIL:

Let me preface this final set of questions with a few remarks. First, I think you were a masterful teacher and that is one of your most important contributions to thousands of grad and undergrad students over the past fifty years. You made theory, analysis, interpretation, and concepts of development come alive for us. What prompted you to "teach" an alternative version of developmental psychology (e.g., all those courses you constructed—*Love and Hate in Life and Literature, Symbolism in Everyday Life, Interpretation of Dreams, Mysteries of Identity, Depth Psychologies, Developmental Theories and Theories of Interpretation, Psychology and Related Disciplines, Psychology as a Human Science,* and many more)?

BERNIE:

I do appreciate those flattering comments, Sunil, but I try to keep in mind that there are millions in the United States who believed Ronnie Reagan to be a great communicator and teacher, and even millions today who will exalt Osama bin Laden, George Bush, Dick Cheney or John Ashcroft for illuminating their minds and making their lives worth living.

More seriously: Throughout my adult life, I've been fascinated with the manifold ways in which people act and produce things, and with the conditions under which these acts and productions take place. I'm sure that this was not, and is not, at all a unique concern. Early in my career, I found out that I could not learn very much about these things in academic psychology, with all the fallacies of what Whitehead called misplaced concreteness. I believed that I learned far more about human action and thought from reading Shakespeare, Balzac, Dickens, Joyce than through scrutinizing articles in the various psychological journals.

Through luck and chance, I was fortunate most of my years at Clark to be free to teach whatever I wanted. As you know, one of the best ways of learning is to teach, especially if one keeps in mind how little one does know. I didn't buy into the academic shibboleth that one had to go through a fixed curriculum in order to "develop". Certainly, there is a need for a fixed curriculum, a rather rigid sequence of courses, in certain disciplines, e.g., mathematics, physics, biology. But, from my point of view, not at all in the so-called soft disciplines. Yet this is what I found in Psychology.

My basic antinomian character asserted itself. Since I did not think of psychology as an autonomous discipline, I looked to explore the various *two-way* relationships between psychology and what I took to be related disciplines. Come to think of it, I don't know of any disciplines (Wissenschaften) that are not related to psychology. I can still recall, in one of the first seminars I offered in *Developmental Theories*, that I used as principal texts, Hegel's *Phenomenology of the Spirit*, R.G. Collingwood's *Idea of History*, Bert Hoselitz' *Theories of Economic Development* and John Dewey's *Logic: The Theory of Inquiry.*

About those courses you mentioned before: We all know that course titles in a catalogue mean nothing. Given the same title for a course, different teachers may well discuss quite different topics and assign quite different texts. That is, unless John Ashcroft or the APA insists on a monolithic and uniform curriculum. Having, as I said, the freedom to do so, I introduced seminars that were of interest to me and that I thought would be of interest to students.

Take *Love and Hate in Life and Literature*. That was my alternative for a seminar on emotions. In my view, reified "emotions" are irrelevant to an understanding of human action in society. I believed that we learned much more about the emotional life of ourselves and others through literature than we ever did from the work of academic psychologists. I won't go into the rationale for the other courses here. You get the idea.

I early came to the realization that our attempts to understand human beings had to involve us in phenomenology and hermeneutics, and I thought it was extremely important that our often encapsulated and hermetically enclosed students become familiar, at least to some extent, with these movements: Husserl, Merleau-Ponty, Gurwitsch, Habermas, Gadamer, Ricoeur and good old Kenneth Burke. These were rarely people confronted in the usual psychology courses at Clark or elsewhere. I can recall once saying to George Klein, one of the then eminent psychoanalytic scholars, that in my view, Burke had written the two best works on Motivation around. Klein asked me "What psychology department was Burke in?", apparently on the assumption that an understanding of motivation was the province of "psychologists".

I am aware that students would often remark that I taught the same course under a variety of titles. Surely, more than a touch of truth in that claim. Everywhere I was concerned with that classic Socratic preoccupation: "How ought once to live?" I was alert to the fact that this question had numberless answers, and that much of life consisted of people trying to persuade other people, and perhaps themselves,

that their way of responding to that profound question was either the only way (methodos) or the right way. I wanted my students to examine these different ways and to be alert to the various rhetorical means individuals and groups used to gain the adherence of others to their point of view.

I realize that I, and the seminars I used to offer, are today outsiders in the psychology department. I several times offered to teach my course on *Interpretation of Dreams* gratis in the department, but my offer was ignored. I now offer my seminar on *Mythical Thinking and the Interpretation of Dreams* in the English department![30] And, if I make it through the next two years, I hope to join colleagues in the philosophy department to offer a seminar on psychology and hermeneutics. One time, in the psychology department, I offered a seminar on Cassirer, Burke and Bakhtin. The likelihood of me or anyone else offering such a seminar today is, as they say in soccer matches, nil!

A few words about the course I offered to first year undergraduates as an alternative to the usual introductory psychology course: I called it *Psychology as a Human Science*. I had long objected to the departmental policy that made Psychology 101 a prerequisite for all other courses in the department. It was surely not a prerequisite for any of the courses that I offered. It took me about five years to get it accepted as an alternative to the usual Introductory course. Not so easy. Whenever one tries to do something novel or to challenge an existing institution, there are always back-up devices to sustain the status quo.

I suddenly found that a number of my colleagues (e.g., one teaching statistics) arbitrarily decided to make Psychology 101 a prerequisite for their courses, ones that students were obliged to take in order to fulfill requirements for the major. In a fit of spite,—I now only partly regret the fit—I then made Psychology as a Human Science a prerequisite for almost all of my other courses, Interpretation of Dreams, Creative Process, Symbolism in Everyday Life, Love and Hate in Life and Literature, etc. and childishly made Psychology 101 a negative prerequisite. If one took that course, one had great difficulty in taking my upper level courses. An example both of my infantilism and politics in the university.[31]

SUNIL:

I consider myself fortunate (along with students like Lisa Comparini, Jim Dillon, Galina Zeigarnik, Michelle Mamberg, Fulvia Quilici-Matucci, Skip Young

[30] It's been my experience that faculties in English departments, some philosophy departments and departments of comparative literature are usually far more familiar with a wide range of "psychological theories" than are psychologists.

[31] I would often write little essays for the freshmen students in this course. One of them was entitled "Notes on Theoretical Life as Drama and Conflict". In that essay, I tried to highlight the analogy between arguments among theorists in academic disciplines and arguments among politicians on the national scene. I should mention that for a long period of time, I wrote mainly for my students, undergraduate and graduate and not for professional publications—doubtless due to unconscious factors not revealed in my psychoanalysis.

and others—although I can't speak for them) to be one of the last of the students at Clark to have worked closely with you. My sense is that there is a New World Order in the department, and that your direct influence on students—for want of a better word—, is fading or non-existent. What do you think are the losses for the students and the department as a whole from not being able to learn from your understanding of psychology, development, and, generally, about the "life of the mind"?

BERNIE:

Enormous! Miniscule! Catastrophic! Liberating! It is surely one of the lessons one should learn, if not from history, then from Ecclesiastes. Whenever a new regime comes into power, it will try to institute its own policies and priorities. Only a delusional individual will seek to maintain things as they were. In this respect, Departments in universities are no different from any other political institutions. Whatever I tried to teach students during my tenure will, in one way or another, be taught by others, either in the department or somewhere in the university. And, if not there, through comic strips (e.g., Wiley's *Non-Sequitur*),[32] political cartoons, reflection on proverbs or aphorisms, sites on the Internet, or cultural journals.

Although the conduit metaphor is now depreciated in many quarters, I basically took myself as being a conduit for ideas that have been around for millenia. After all, the issues I considered in all of my courses were the classic ones, the ever recurring ones: The problem of the categories; the problem of the one and the many; the tension between order and chaos; the relations of parts and wholes; the dialectic between forces that separate/differentiate and forces that unite/integrate.[33] Will not students be obliged to deal one way or another, reflectively or otherwise, with these issues both in their careers and their lives?

The historical amnesia that has afflicted students in universities[34] and the accompanying cult of novelty almost insured that most students would not be aware of views that are momentarily deemed passé, "antiquated" or "obsolete". They would only be energized by the writings of contemporary scholars who had often, wittingly or not, plagiarized from the writings of their predecessors or, less captiously, ventriloquated views they had heard or read from others in their earlier lives.

Partly in jest, partly in earnest, I would often say that the perpetual job of those of those of us in the Human Sciences was to disinter views that had been ground down into the muck, and resurrect them. This often takes a new terminology, a

[32] On not a few occasions, I have used comic strips, political cartoons and parlor games as vehicles to provoke discussions of many of the profound issues treated abstrusely in the academic literature. I'd invite any of the readers of this piece to try that with themselves or their students.

[33] Heinz Werner was not alone in foregrounding this dialectic. One may mention here the brilliant sociologist, Georg Simmel (e.g., Simmel, 1955) and the philosophical anthropologist Mikhail Bakhtin.

[34] In regard to this historical amnesia, I would refer my readers to George Steiner's brilliant little book, *In Bluebeard's Castle* (Steiner, 1971).

catchy one. I recall once, speaking with a very eminent psychologist, about a new terminology he had introduced in his writings. I remarked to him that it seemed to me that he had taken over Cassirer's ideas and has simply rebaptized them. He told me that he kept Cassirer's writings at his bedside. I suggested to him that he ought to *read* them.

I am now retired. I avoid department meetings, believing that a retired generation should not, in the slightest way, try to impose policies on a new generation. Of course, that will not stop some. Much like any other member of an older generation, I am sometimes dismayed at what members of the new generation are doing. But then I remember that such has always been the case between parents and their children.

Since I am not yet ready to go "gently into the night",[35] I still try, informally and in settings outside of the department, to argue for positions and orientations that I believe are extremely valuable. As you may know, I hold informal colloquies in my home with faculty from both Clark and Holy Cross on issues of common interest. Some of my colleagues here are philosophers, psychologists, students of literature, historians, and visual and performing artists. Interdisciplinary! Transdisciplinary!

And I also make intensive and extensive use of the Internet so that I can become a student again, and find out how little I know and how much there is to know. I must acknowledge that I have learned and learned more deeply about an enormous variety of subjects in three years on the Internet than I learned throughout my career in colleges and universities. By the way, I have five groups on the Internet dealing with various issues I find of great interest.

For some reason, I like to think that what I am doing in such contexts is perpetuating Heinz Werner's vision. If Werner had lived, I believe he would have been more than sympathetic to my move toward Genetic-Dramatism, even thought he might have frowned at the title. Perhaps a loyalty one owes to someone he takes to be his intellectual uncle if not his intellectual father. Or, as Burke might put it, an expression of piety with regard to one's ancestors and one's tradition.

INGRID:

Just one more question. If you could establish some special kind of department or institute in the university to carry out your vision of education for graduate students, what would it be like? What would you try to set up?

BERNIE:

Utopia? Well, first of all I would like to see the graduate students—leaders of the future—obtain more of an education than to be subjected mainly to training

[35] I'm not sure whether a reference is needed for this line, but the least I can do is note that it comes from the Collected Poems of Dylan Thomas.

or dressage. One might have expected that kind of education to have taken place when they were undergraduates. But it has certainly been my experience that many psychology graduate students are woefully ignorant of history, literature, sociology, anthropology and philosophy. And not a few insist that such stuff is irrelevant to their careers.

I would also like to see the resurrection of an atmosphere in which students are not co-opted to do a variety of tasks, tangential or irrelevant to their education. I'm sure you're aware of what I'm talking about. I've heard quite a number of students complain about such demands made on them. Graduate students are not, after all, serfs or indentured servants. Or, are they?

I'd also love to see a context in which students take the initiative to question and criticize the views of the different faculty members, and come to expect that one of things faculty members should try to do is to show the relevance of their "theories" to issues that the students are concerned about, without preoccupation about later letters of recommendation. Why, pray Professor, should I be interested in what you have to say?

Another wish: It would be gratifying if both faculty and students, thinking of engaging in some activity, loosely called research, would have a deep appreciation of work done in the past and being done in other disciplines with respect to the issues with which they are concerned. There should be both some degree of historical sophistication and a critical analysis of what others have said and what they are saying. I'm almost tempted to advocate that graduate students, in their first two years, be exposed to some classic works in the history of ideas (Cassirer, Lovejoy, Burke, etc.). To formulate, in technical terms, my concern with what is often going on now: *Garbage in, garbage out!*

Finally, I'd like some attention paid to that famous question posed many years ago by Robert Lynd (1939), *Knowledge for What?* Why, with regard to my life, the lives of others, the society in which I live, the world in which I live, have I engaged in the work I have done during my career? What I'm suggesting is that, "as the world turns", we can no longer be encapsulated in our professional careers, without considering what is happening everywhere around us.

All of this, of course, assumes world enough and time. None of us have the world, let alone the time. This is especially the case for active faculty and students who have careers to advance, jobs to fulfill, and reputations to establish or enhance. But since this is Utopia, perhaps time will have a stop!

Now, if I may, let me close this interview by quoting from T.S. Eliot's East Coker:

> So here I am, in the middle way, having had twenty years—
> Twenty years largely wasted, the years of l'entre deux guerres—
> Trying to use words, and every attempt
> Is a wholy new start, and a different kind of failure
> Because one has only learnt to get the better of words
> For the thing one no longer has to say, or the way in which
> One is no longer disposed to say it. And so each venture

Is a new beginning, a raid on the inarticulate,
With shabby equipment always deteriorating
In the general mess of imprecision of feeling,
Undisciplined squads of emotion. And what there is to conquer
By strength and submission, has already been discovered
Once or twice, or several times, by men whom one cannot hope
To emulate—but there is no competition—
There is only the fight to recover what has been lost
And found and lost again and again: and now, under conditions
That seem unpropitious. But perhaps neither gain nor loss.
For us, there is only the trying. The rest is not our business.

Home is where one starts from. As we grow older
the world becomes stranger, the pattern more complicated
Of dead and living. Not the intense moment
Isolated, with no before and after,
But a lifetime burning in every moment
And not the lifetime of one man only
But of old stones that cannot be deciphered.
There is a time for the evening under starlight,
A time for the evening under lamplight
(The evening with the photograph album).
Love is most nearly itself
When here and now cease to matter.
Old men ought to be explorers
Here or there does not matter
We must be still and still moving
Into another intensity

For a further union, a deeper communion
Through the dark cold and the empty desolation,
The wave cry, the wind cry, the vast waters
Of the petrel and the porpoise. In my end is my beginning.

Sunil and Ingrid, I would like to thank you for giving me this splendid opportunity to talk about my experiences at Clark, with Heinz Werner, with many of my faculty colleagues, with many of my student colleagues. It's been a pleasure for me. Let us hope that what I have said, and how I've said it, will make its way through the censors.

REFERENCES

Abrams, M.H. (1953). *The mirror and the lamp.* New York: Oxford University Press.
Abrams, M.H. (1971). *Natural supernaturalism.* New York: Oxford University Press.
Arnold, M. (1869). *Culture and anarchy.* London: Smith, Elder & Co.
Barten, S., & Franklin, M. (Eds.) (1978). *Developmental processes: Heinz Werner's selected writings.* New York: International Universities Press.

Bernstein, R.J. (1983). *Beyond objectivism and relativism.* Philadelphia: University of Pennsylvania Press.
Bloom, H. (Ed.) (1970). *Romanticism and consciousness.* New York: W.W. Norton.
Boas, F. (1911/1963). *The mind of primitive man.* New York: Collier Books.
Burke, K. (1945). *A grammar of motives.* Berkeley: University of California Press.
Burke, K. (1950). *A rhetoric of motives.* New York: Prentice-Hall.
Burke, K. (1966). *Language as symbolic action.* Berkeley: University of California Press.
Carithers, M., Collins, S., & Lukes, S. (Eds.) (1985). *The category of the person.* New York: Cambridge University Press.
Cassirer, E. (1923–1929/1953–1955). *Philosophy of symbolic forms* (3 volumes). New Haven: Yale University Press.
Cassirer, E. (1944). *An essay on man.* New Haven: Yale University Press.
Cassirer, E. (1960). *The logic of the humanities.* New Haven: Yale University Press.
Clark, K., & Holquist, M. (1984). *Mikhail Bakhtin.* Cambridge: Harvard University Press.
Danto, A. (1965/1980). *Nietzsche as philosopher.* New York: Columbia University Press.
Dewey, J. (1931/1963). *Philosophy and civilization.* New York: Minton, Balch & Co.
Diamond, S. (Ed.) (1960). *Culture in history: Essays in honor of Paul Radin.* New York: Columbia University Press.
Dijksterhuis, E.J. (1986). *The mechanization of the world picture: Pythagoras to Newton.* Princeton, N.J.: Princeton University Press.
Geertz, C. (1973). *Interpretation of cultures.* New York: Basic Books.
Geertz, C. (1983). *Local knowledge.* New York: Basic Books.
Harding, S., & Hintikka, M. (Eds.) (1983). *Discovering reality: Feminist perspectives on epistemology, metaphysics, methodology, and philosophy of science.* Dordrecht, Holland: D. Reidel
Hardy, A.T. (1990). *Psychology and the critical revolution.* Guilderland, N.Y.: James Publications.
Harris, M. (1968). *The rise of anthropological theory: A history of theories of culture.* New York: Thomas Y Crowell.
Herb, G., & Kaplan, D. (Eds.) (1999). *Nested identities.* New York: Rowan and Littlefield.
Kaplan, B. (1966). The study of language in psychiatry: The comparative developmental approach and its application to symbolization and language in psychopathology. In S. Arieti (Ed.), *American handbook of psychiatry,* volume 3 (pp. 659–688). New York: Basic Books
Kaplan, B. (1967). Meditations on genesis. *Human Development, 10,* 65–87.
Kaplan, B. (1983). Genetic-Dramatism: Old wine in new bottles. In S. Wapner & B. Kaplan (Eds.), *Toward a holistic developmental psychology (pp. 53–71).* Hillsdale, N.J.: Lawrence Erlbaum & Associates.
Kaplan, B. (1984). Development: Psychological and otherwise. *Paper presented at Grand Rounds in Psychiatry, University of Massachusetts, Medical School.* Copy available on request.
Kaplan, B. (1985). Basking in Burke. *Unpublished manuscript.*
Kaplan, B. (1988a). Notes on representation and interpretation. *Unpublished manuscript.* Copy available on request.
Kaplan, B. (1988b). Psychology and criticism: Literary and otherwise. *Unpublished manuscript.* Copy available on request.
Kaplan, B. (1992). Strife of systems. Tension between organismic and developmental points of view. *Theory & Psychology, 2,* 431–443.
Kaplan, B., & Wapner, S. (Eds.) (1963). *Perspectives in psychological theory: Essays in honor of Heinz Werner.* New York: International Universities Press.
Kermode, F. (1985). *The art of telling.* Cambridge: Harvard University Press.
Kluckhohn C. (1962). Universal categories of culture. In S. Tax (Ed.), *Anthropology today.* Berkeley: University of California Press.
Kroeber, A.L., & Kluckhohn, C. (1963). *Culture: a critical review of concepts and definitions.* New York: Vintage Books.
Lovejoy, A.O. (1936). *The great chain of being.* Cambridge, MA.: Harvard University Press.
Lovejoy, A.O. (1948/1960). *Essays in the history of ideas.* New York: G.P. Putnam' Sons (Capricorn Books).
Lynd, R. (1939). *Knowledge for what?* Princeton: Princeton University Press.

Nathanson, S. (1985). *The ideal of rationality.* Atlantic Highlands, N.J.: Humanities Press International.
Nehemas, A. (1985). *Nietzsche: Life as literature.* Cambridge, Harvard University Press.
Northrop, F.S.C. (1947). *Logic of the sciences and humanities.* New York: MacMillan.
Pepper, S.C. (1942). *World hypotheses: A study in evidence.* Berkeley: University of California Press.
Perelman, C. (1982). *The realm of rhetoric.* Notre Dame, Indiana: University of Notre Dame Press.
Redfield, R. (1953). *The primitive world and its transformations.* Ithaca: Cornell University Press.
Ricoeur, P. (1974). *The conflict of interpretations.* Evanston, Illinois: Northwestern University Press.
Rorty, R. (1979). *Philsophy and the mirror of nature.* Princeton: Princeton University Press.
Simmel, G. (1955). *Conflict: The web of group-affiliations.* New York: Free Press.
Steiner, G. (1971). *In Bluebeard's castle.* New Haven: Yale University Press.
Tylor, E. (1871/1889). *Primitive culture.* New York: Holt.
Werner, H. (1948). *Comparative psychology of mental development.* Chicago: Follett Publishing Company.
Werner, H., & Kaplan, E. (1952). The acquisition of word meanings: A developmental study. *Monographs of Social Research in Child Development, 15.* Werner, H., & Kaplan, B. (1963/1983). *Symbol Formation.* Hillsdale, N.J.: LEA Pubishers.
Williams, R. (1958). *Culture & society 1780–1950.* New York: Harper Torchbooks.

6

THE SENSORY-TONIC FIELD THEORY OF PERCEPTION

Seymour Wapner

The earliest theories of perception, the sensory theories of classical psychophysics, were restricted to traditional psychophysical facts and ruled out individual variability. In contrast, during the 1940's, with the appearance of the so-called "new look" in perception, steps were taken to deal with facts covered by social, personality and clinical psychologists and the theoretical emphasis shifted to the role of subjective as well as autochthonous factors as determinants of perception (see Blake & Ramsey, 1951; Bruner & Klein, 1960; Zener, 1949a, 1949b). More specifically there emerged a need to account for the projective nature of perception, that is, the role of cognitive, conative organismic states (e.g., needs, motivation, thought) as intrinsic aspects of perception.

Suppose it is true, as demonstrated by Bruner and Goodman (1947), that value and need affect size perception where relative to wealthier children, poorer children perceived coins as larger, the central problem remains as to how the visual factor of size and the personal factor of need—interact. From the perspective of the sensory-tonic field theory of perception (Werner & Wapner, 1949, 1952a), these factors appear to be, but are not actually alien to one another. A significant step in overcoming this dichotomy was the emergence in functionalist psychology and behaviorism of the notion of replacing sensory constructs by taking into account motor aspects of behavior. Such theorizing involves the notion of interaction of sensory and motor factors, or more generally objective and subjective factors, which point to the need for conceptualization of a process that is prior to both.

According to sensory-tonic field theory, the answer was that the two factors were of essentially the same nature, namely, that no matter how diverse the source of stimulation to the organism (i.e., independent whether the stimulation comes

through *extero-*, *proprio-*, or *intero*-ceptors), underlying it was the common feature that all stimulation was sensory-tonic in nature, which is assumed to have vectors with direction and magnitude that interact in those terms. Thus, perception may be affected equivalently by various kinds of sensory stimulation, direct muscular changes and various need and motivational states.

For example, correspondence, balance or harmony of forces between the state of the organism and stimulation from an object was assumed to define a stable state of the system reflected in particular percept, for example—a luminous rod in a darkroom perceived as vertical. Perception is a reflection of a "part" proximal stimulation in relation to the context of organismic activity, "organismic state." The relationship is defined symbolically as **sRo**, where "s" represents proximal stimulus, "o" represents organismic state and "R" represents relationship. Given this formulation, it follows that changes in perception can occur as a function of changes in either aspect of the polarity "organism-object," that is, there are changes in perception with changes in the organismic context, on the one hand, or with changes in the part, i.e., proximal stimulus, on the other (Wapner, 1964b, pp. 198–199).

This led to experimentation where there was not only variation in the state of the organism, but also variation in proximal stimulation. Accordingly, our theoretical perspective underpinned a very broad variety of empirical studies dealing with the role of intra-organismic factors (e.g., muscular states, danger, success-failure, self-other attitudes, motives, developmental status, psychopathology) on various aspects of space perception (e.g., verticality up-down, left-right, near-far) as well as body perception (e.g., size, shape) (cf. Wapner, 1969; Wapner, Werner, & Chandler, 1951; Wapner, Werner, & Krus, 1957a, 1957b; Werner & Wapner, 1952a, 1954, 1955; Wapner, Werner, & Comalli, 1956; Wapner & Werner, 1957, 1965); moreover, our perspective dealt with studies involving variation in proximal stimulation, for example, geometric and physiognomic stimulation.

Another aspect of perception, motion perception and its relation to motor activity can be approached through use of the construct of **vicariousnes** (Werner, 1945). Vicariousness, based on the notion of dynamic equivalence of sensory and muscular factors, means that sensory-tonic energy may be released through various channels, for example, through muscular-tonic activity of movement or through perceptual activity. While relations between cognitive operations can be approached through the vicariousness concept where occurrence of one operation makes for diminution of another, relations among cognitive operations may also involve a ***supportive*** relationship where simultaneous operation of cognitive processes facilitate one another.

GENERAL AND DEVELOPMENTAL FACTORS INVOLVED IN SPACE PERCEPTION

Our earliest work dealt with general perceptual mechanisms involved in object localization. This area of research was chosen not only because of its importance

for the human functioning in the world in which humans live, but also because it was an effective area in which to demonstrate that organismic factors play a role in perception. Following and concurrent with conducting these studies on organismic factors in perception, a number of studies were carried out on development.

The study of development in relation to perception is linked to our treatment of perception in terms of "object-organism" relationships. Changes if "object-organism relationships are expected to be reflected in developmental changes in perception. Such changes are presumed to be a function of the general law of development described as the orthogenetic principle which states that development proceeds from dedifferentiation to an increase in differentiation and hierarchic integration (e.g., Werner, 1957; Werner & Kaplan, 1956). Differentiation has meaning with respect to differentiation of self (body) and environment (object). Hierarchic integration has relevance to hierarchically ordered genetic levels (e.g., sensory-motor vs. perceptual; establishment of stable spatial frameworks). It is important to appreciate that development when characterized in these formal terms has broad applicability, namely, to age changes, microgenesis, effect of primitivizing drugs, such as lysergic-acid diethylamide (LSD), optimal versus less optimal conditions of functioning, and problems of psychopathology and neuropathology. Variation due to pathology is underpinned by two assumptions: any organism operates on a multiplicity of levels (progression-regression hypothesis); and that psychopathological groups operate at levels in certain areas that are comparable to earlier levels of development (regression hypothesis). Furthermore, the developmental viewpoint aids in studying the problem of individuality, that is, the developmental formation of stable perceptual differences between individuals, and such problems as the increasing diversification of operations between individuals, and the increasing stabilization of an individual's frame of reference within which he or she perceives the world.

General Factors

Our empirical studies initially focused on perception of verticality because it represents a simple situation where a perceptual property can be studied as dependent on organismic state or the relation between the object stimulating the organism and the organism reacting to the stimulation. One of the assumptions of sensory-tonic field theory is that there is a functional equivalence between sensory and muscular factors. Accordingly, we expect that stimulation through the sense organs, such as the ear and direct stimulation of the muscles should produce analogous results in perception. This was followed by analogous experimentation in other dimensions of space, such as up-down, left-right and near-far.

Verticality

In our studies of perception of verticality, the participants had the task of adjusting a luminous rod, in a dark room, to a physical position that appeared

straight-up-and-down (termed apparent vertical). In all cases, there was stimulation to one side of the body: electrical stimulation to the left or right sternocleidomastoid neck muscle and auditory stimulation to right or left ear (Wapner, Werner, & Chandler, 1951); right and left tilt of the body while supported and unsupported (Wapner, Werner, & Chandler, 1951); rotary acceleration around the vertical axis of the body (Wapner, Werner, & Morant, 1951); and emotional stimulation or danger to one side (Wapner, Werner & Comalli, 1956). In adults, all these forms of unilaterally applied stimulation operated in a functionally equivalent manner: apparent vertical was rotated relatively opposite the side to which stimulation was applied. This variety of forms of stimulation were presumed to change neuromuscular, organismic state, which made for systematic changes in perception of verticality.

Another set of studies was concerned with the effect of variation of object stimulation on visual localization (e.g., Werner & Wapner, 1952b). Here, it was found that the position of the apparent vertical was relatively close to the position in which the stimulus object (luminous rod) was started at the beginning of a trial. This was accounted for by assuming a biological tendency, which operates toward maintaining or re-establishing stable relationships between "proximal stimulus" and "state of the organism" such that the organismic state changes in keeping with the stimulus input (cf. Werner & Wapner, 1952b, 1952c; Wapner & Werner, 1957). As noted earlier, there were a number of developmental studies in this area as follows.

Up-Down

Similar significant findings were obtained for perception of eye-level, the up-down dimension of space as assessed by location of apparent eye level; these included general mechanisms (cf. Glick, 1959; Sziklai, 1961; Wapner, McFarland, & Werner, 1963), object stimulation (e.g., Kaden, Wapner, & Werner, 1955; Wapner & Werner, 1955a; Jaffee, 1952; Comalli, Werner, & Wapner, 1957); age changes from childhood to adulthood, (e.g., Wapner & Werner, 1957); psychopathology and primitivizing drugs (e.g., Carini, 1955; Wapner & Krus, 1960; Rosenblatt, 1956; Krus, Wapner & Freeman, 1958).

Left-Right

Similarly for the left-right dimension of space, as assessed by determining the location of the apparent median plane (straight-ahead), findings pertinent to the mechanism of extraneous and object stimulation were obtained (e.g., Bruell & Albee, 1955; Wapner & Werner, 1955a; Werner & Wapner, 1954) as well as findings for groups ordered developmentally (Wapner & Werner, 1957).

Near-Far

Moreover, studies on the near-far dimension have not only dealt with general mechanisms (e.g., Goldstein, 1955, 1959) but have also included psychological distance under *danger*. When walking toward a dangerous locale, a precipitous edge, space shrinks (Wapner & Werner, 1955a, 1955b); moreover, interpersonal feelings,

liking or disliking the "other," had an impact on psychological distance from the "other." Using three visual conditions (binocular, monocular vision, blindfolded) when asked to walk to a specified distance (2 or 8 feet) from a person in a dimmed room, as expected, subjects stopped further away from a "close" person than from a remote person, that is, relative to those who were liked compared to those who were disliked (Isaac, 1958).

Developmental Changes in Space Perception

Age Changes

The changes from 6 to 80 years of age, were as follows:

> ...For young boys from 6 to 15, the apparent vertical [physical position in which the rod is placed to appear vertical] is located to the *same* side as body tilt; between 16 and 50 years, however, the opposite effect occurs, viz., the apparent vertical is located to the *opposite* side of body tilt; finally in older men from 65 to 80, of age, the apparent vertical is again located to the *same* side as body tilt (Comalli, Wapner & Werner, 1959, p. 265). (Also see Wapner, 1964a, 1964b, 1968.)
>
> Developmental changes in effect of starting position were found to occur only within the younger age range: the starting position effect is greatest at the youngest age level, [6 years] decreases markedly until the nineteen year level, and following this there are no consistent developmental changes throughout the age levels studied, including the sixty-five to eighty-year group (Wapner, 1964b, pp. 204–205).

Psychopathology

Perception of verticality in schizophrenics was studied utilizing a regression hypothesis. Carini (1955) found in normal adults, as in other studies, that the position of apparent vertical was opposite the side of body tilt, whereas in catatonic-hebephrenic schizophrenics, similar to young children, the position of apparent vertical was located to the same side as body tilt, with paranoids falling between these extremes.

Drugs

Greater starting position effects occur with primitivizing drugs (LSD-25) for normal adults; however, the greater effects of body tilt that occurred in children were not found (Werner, 1957; Liebert, Werner & Wapner, 1958).

RELATION BETWEEN APPARENT POSITION OF ONE'S OWN BODY AND THAT OF OTHER OBJECTS. The experimental situation consists of the person carrying out two tasks while tilted in a chair in a darkroom: (a) adjusting a luminous rod to a position that appears vertical, and (b) adjusting a luminous rod to a position that appears parallel to the longitudinal axis of one's body.

Verticality/Body Position

The angular separation between apparent vertical and apparent body position deals with the self-world relationship and reflects the degree of differentiation between body space and object space. There was evidence in keeping with the assumption that there is lesser polarization between body and object space in younger children [7–12 years] which increases with development and is coupled with a greater angular separation of body and object space with increase in age [12 to 17 years] (Wapner, 1964 a, 1964b, 1968; Wapner & Werner, 1957; Werner, 1940).

Some work was also done on variation of body-object relationships through instructions. Glick (1964) introduced instructions that viewed the self as separate and distinct from the object world and vice-versa. He found evidence that perceived space, assessed by location of the straight-ahead, varies depending on the attitude (fused with object vs. separated from object) adopted by the subject toward the relationship between self and the object environment.

Effect of Surrounding Space

One problem explored was that of the impact of the surrounding visual context on the perception of arm length and apparent head width (Wapner & Werner, 1965). In the arm length experiment, the subject was placed so that one arm is outstretched to open-extended space and the other arm outstretched to a barrier wall. There were also two control conditions, namely, both arms outstretched to extended space and both arms extended toward a barrier wall. The task for the subject was to indicate which arm appeared longer under these four conditions. There was clear cut evidence that the arm outstretched to open space appeared longer.

Apparent Size of Body Parts

In addition to the study of localization of the body in space, various investigations have been conducted concerning size of one's own body parts. Two situations have been employed: one dealt with apparent head width and the other with apparent arm length (McFarland, Wapner, & Werner, 1962; Wapner &Werner, 1965). Apparent head width was assessed by having the subject point with eyes closed to indicate where the cheekbones of his or her face would be projected on to a meter stick horizontally mounted 18 inches from one's face. For apparent arm length three methods were employed. In one technique, under various conditions, the subject stretched his or her arms forward and judged which arm appeared longer. In the second technique in a dark room, a board with a luminous marker was placed over the subject's arms, the subject was required to instruct the experimenter how to move the luminous marker until it was located where he or she perceived the finger tip of the outstretched arm to be (Humphries, 1959). In the third method, comparison of the two outstretched arms were compared with respect to which appeared longer: the arm extended toward the barrier wall. Wapner, McFarland, & Werner (1962) found that apparent arm length was perceived as longer in an "open-extended " spatial context than in a "close-confined" context.

A second problem concerned the effect of the experienced boundary of the head and of the experienced length of arms of the subject outstretched in front of him or her. Articulation of the boundary of the head through touch, heat, and cold decreases apparent head width (Humphries, 1959; Wapner, 1969; Wapner, Werner & Comalli, 1958) and the outstretched arm articulated by touch was also experienced as shorter. There was, however, evidence, in keeping with Merleau-Ponty's phenomenological analysis that there is a difference whether articulation of the finger tips of the outstretched hand is passively "being touched" or actively "touching" an object out-there: the arm is experienced as shorter when passively being touched than when actively touching (Schlater, Baker & Wapner, 1981).

Since these studies dealt with aspects of the boundary between self and world, it appeared suggestive to assess age changes where the relationship between self and world changes with increase in age.

Developmental Changes in Body Perception

As a follow up of the developmental changes in relation between body space and object space, studies on age changes, psychopathology and primitivizing drugs were conducted with respect to such aspects of perception as apparent head size.

Age Changes from Childhood to Old Age

Subjects from 4 years of age to 80 years were employed in a series of experiments that led to the following findings: there was striking overestimation of apparent head size for all the age levels; overestimation was greatest in youngest children, decreased sharply until age nine, following which overestimation remained fairly steady through the adult groups with some further decrease in the oldest subjects; at all age levels, articulation of the boundary of the head through touch decreased the apparent width of the head, the efficacy of touch in reducing apparent head width was relatively constant throughout all age levels (e.g., Wapner, 1961a, 1961b, 1963).

Psychopathology

Findings in a preliminary study suggested that the apparent head width was overestimated to a greater degree in schizophrenics than in normal adults (Wapner & Krus, 1960a). This was more recently corroborated by Wapner and Demick (1980), who demonstrated both group differences (schizophrenics, antisocial personalities) and changes related to environmental relocation.

Drugs

Studies indicated that, with ingestion of the primitivizing drug LSD-25, there was an increase in size of the apparent head width and apparent arm length

(Liebert, Werner, & Wapner, 1958; Wapner & Krus, 1960). The above series of experiments:

> ... fit together in terms of the concept of differentiation between body and environment: a decrease in apparent body size occurs with articulation of the boundary of the body part, which is assumed to make for greater differentiation between body and environment; an increase in the apparent size of body parts occurs in young children, older retarded children, schizophrenics, and normal adults under the influence of LSD-25 all of which are presumed to be characterized by lesser differentiation between self and world (Wapner, 1964b, p. 218).

Relations Among Cognitive Operations

The relations among processes representing different levels of organization have been explored using two types of relationship, namely, vicarious and supportive. A vicarious relation implies that utilization of one operation militates against use of another, (e.g., with use of sensori-motor activity, there is a diminution of perceptual and/or conceptual activity). In contrast, a supportive relationship implies that simultaneous occurring cognitive operations facilitate one another to make for greater efficiency in the attainment of ends.

Vicariousness

The vicariousness concept led to the following hypothesis: if sensory motor activity is blocked from being released in motor channels, it will find expression in heightened perceptual motion and, contrariwise, if energy is released though greater motor activity this will find expression in reduced perceptual motion. This expectation was supported by Goldman (1953) who found that autokinetic motion (apparent motion of a physical pin point of light in a dark room) was greatest under immobilization (inhibition of motor expression), less under control (free situation), and least under heightened body activity (increase of motor expression).

In a second experiment, subjects were required to report what they saw when a line drawing such as a train, baseball player, etc. was presented tachistoscopically. An experimental group who exerted muscular effort reported significantly fewer movement responses than a control group with no muscular effort (Krus, Wapner, & Werner, 1953). In a third experiment using the same procedure as the second, with strong motor involvement a significant decrease in perceptual sensitivity was obtained as measured by recognition threshold (Krus, Wapner, & Werner, 1953).

Supportiveness

Miller (1959, 1963) found that the lapse of meaning, which may occur with verbal repetition of a word, was delayed significantly when simultaneous with repetition of a word there is introduced sensori-motor behavior consonant with the meaning of the word.

Studies with Developmentally Ordered Groups

Hurwitz (1954) simultaneously introduced the factors of vicariousness and of development as variables. Clinically hyperactive and hypoactive children from 8 to 12 years of age were compared on responses to a Rorschach test. Findings were in keeping with the expectation that the hypoactive group (more mature) produced significantly more human movement responses than the hyperactive group (less mature). Misch (1954) and Kruger (1954) compared groups of people prone to give into their impulses directly in skeletal muscular activity with other groups who tended to displace impulses to the ideational sphere. Their prediction that the ideational group would show more "developmentally advanced responses" and more human movement responses than the motoric groups was confirmed. These studies on vicariousness were complemented by studies on supportiveness.

Physiognomic Perception

Werner (1940) proposed the term "physiognomic perception" for the mode of cognition pertinent to the expressive or dynamic qualities of objects. These qualities are distinguished from geometrical-technical, matter-of-fact qualities, which pertain to the characterization of objects in terms of their structural aspects, viz., the geometry of form, extensity, intensity, etc. For example, colors are experienced not only in terms of hue, brightness, and saturation, but also in terms of being strong or weak, cool or warm; lines not only have extent and curvature, etc., but may be seen as gay or sad; and forms not only have square or circular shape, etc., but also may be seen as static or active (Wapner, 1964b, p. 210).

A variety of methods have been used to study physiognomic perception in terms of directional dynamics, which refers to the vectorial quality expressed in some objects, for example, a running horse, a picture of a bird in flight, an arrow, have strong qualities of motion in a particular direction. The efficacy of these factors was assessed with respect to localization of the straight-ahead the up-down dimension of space, and both autokinetic motion and real motion.

Space Localization

The work on space localization with respect to the straight-ahead is illustrated by use of a particular stimulus object that is ambiguous with respect to directional dynamics. It can be viewed as two birds flying to the left or two airplanes flying to the right (when the stimulus object is reoriented left for right, the opposite relationship holds). When the subject is told to see airplanes flying right, the subject tells the experimenter to move the objects to the left in order to been seen straight ahead, and vice versa. That is, the physical position of the apparent median plane shifts in a direction of the dynamics in the stimulus object (Werner & Wapner, 1954; also see Wapner, Werner, & Krus, 1957a).

Silhouettes of hands pointing downward versus hands pointed upward make for significant shifts in apparent eye level. Apparent eye level shifts in a direction opposite the dynamics in the stimulus object. Symbols connoting upwardness

("rising") or downwardness ("falling") made for analogous shifts in the apparent eye level (Kaden, Wapner, and Werner, 1955).

Autokinetic Motion

Another study utilized autokinetic motion of stimuli with dynamics, such as a running horse, a running boy, and an arrow. Predominance of autokinetic motion occurred consonant with the directional dynamics of he stimulus object (Comalli, 1960; Comalli, Werner & Wapner, 1957). To account for these findings the assumption is made that the visual dynamics affects the equilibrial state of the organism by exerting a pull which is counteracted by an organismic pull in the opposite direction (see Wapner & Werner, 1957; Werner & Wapner, 1956b).

Developmental Changes

On the assumption that the child's world is not clearly differentiated into geometrical-technical and physiognomic aspects, it was expected that directional dynamics in figures could be more potent determiners of the child's perception than that of an adult (Comalli, 1955; Wapner & Werner, 1957). As expected, it was found that the effect of directional dynamics on perceived motion was greater in a young child and this decreased with increase in age.

A LARGE SCALE ONTOGENETIC STUDY ON PERCEPTUAL DEVELOPMENT

A significant systematic step was taken when Wapner and Werner (1957) conducted a study on perceptual development that dealt with ontogenetic changes in spatial organization. The theoretical basis of the study was twofold: conceived on the one side in terms of an organismic theory of perception and, on the other, in terms of a general developmental theory,

> ... the empirical findings are expected: (a) to contribute to a theory of perception which encompasses perceptual functioning not only at adult but also at less mature levels; (b) to further our insight into the general nature of mental growth as reflected in perceptual processes; and (c) to aid in interrelating perceptual and developmental theory. (Wapner & Werner, 1957, p. 1).

Postulates

Postulate I. Perception involves a relationship between object-stimuli and organismic state (psychophysiological). Perceptual experience varies depending on the relationship (stability-instability) between object-stimuli and the ongoing momentary state of the organism. A stable relationship (symbolized by o_x R s_x or o_y R s_y) between stimulus object and organismic state is where there

is no tendency for the organismic state to change. An unstable relationship (symbolized by o_x R s_y etc.) where there is a tendency to change the pertinent aspects of organismic state. For example, o_x R s_x symbolizes perceptual vertical whereas o_x R s_y symbolizes the perceptual experience of tilt.

Postulate II. Given an unchanging stimulus in an unstable relationship with the existing organismic state there is a tendency for the organism to change toward a more stable relationship.

Postulate III. The interaction of heterogeneous factors (sensory vs. organismic), seemingly heterogeneous, are essentially of the same sensory-tonic nature, whether the stimulation is channeled through extero-, proprio-, or intero-ceptors.

Postulate IV. There is a duality of stimuli, object stimuli (stimulation from a source attended to) and extraneous stimuli (stimulation from a source attended to).

Postulate V. Diverse stimuli may ideally lead to identical perceptual end products. There are three kinds of equivalence. Equivalence of: factors directly influencing organismic state (extraneous stimulation); factors pertaining to object stimuli (object stimulation); and of extraneous and object stimulation.

Postulate VI. Vicarious channeling means that available energy may be released through different channels, that is one form of stimulation may substitute or act vicariously for another form of stimulation.

Hypothetical Mechanisms

With respect to space perception, hypothetical mechanisms have been described for the operation of extraneous and object stimulation. *Extraneous stimulation,* as exemplified by body tilt to one side, involves development of forces to counteract gravitational pull on the other side making for a change in organismic state denoted by the term of equilibrial axis, which denotes the distribution of forces or innervation pattern of body state while tilted. To see a rod as vertical, it must be physically adjusted in line with the equilibrial axis of the body to be seen as vertical.

Static Object Stimulation

Gibson and Radner's (1937) study on normalization of a tilted rod, that becomes progressively less tilted with further inspection, is an example of a tendency for the organism to change from an unstable (tilted rod) to a stable (rod appearing less tilted) relationship. Our assumption was that the starting position effect (e.g., apparent vertical is closer to side to which a rod was initially placed) is based on the same mechanism.

Dynamic Object Stimulation

Here, we deal with dynamic qualities of objects such as a picture of a flying bird, which has dynamic properties affecting spatial localization. Our general assumption is that visual directional dynamics affects the state of the organism in a particular manner: we assume that pictorial forms exert a "pull" on the organism in the direction of the dynamics which is counteracted by an organismic "pull" in the opposite direction (Wapner & Werner, 1957, p. 11). The changes in organismic state affect perception with respect to the straight-ahead (apparent median plane), autokinetic motion, and the up-down dimension of space.

The Developmental Viewpoint in Relation to Perceptual Theory

Our treatment of perception in terms of "object-organism" relationships was related to changes inferred from general developmental laws, such as the orthogenetic principle, which states that development proceeds from a state of dedifferentiation to an increase in differentiation and hierarchic integration. Differentiation was linked to changes in perception related to differentiation of self (body) and environment (object). Hierarchic integration has bearing on hierarchically ordered levels of development (e.g., sensory-motor vs. perceptual vs. conceptual), the establishment of stable spatial frameworks, etc. It should be noted that this developmental viewpoint transcended the boundaries of ontogenesis and had implications for general psychology. Moreover, the developmental viewpoint also has implications for individuality, that is, the developmental formation of stable differences between individuals.

Finally, problems of psychopathology (e.g., psychosis, brain injury) are approached through the developmental viewpoint adopted here and its progression-regression hypothesis:

> ... the principal aim of this study is to gain information about the operation of the perceptual mechanisms, formulated by sensory-tonic theory in regard to various levels of development. (Wapner & Werner, 1957, p. 13).

Design of the Study

Two hundred and thirty seven participants, 119 boys and 118 girls, between the ages of 6 and 19 years were employed. Total time of testing was approximately 4 hours. Testing included:

(a) Six experiments dealing with effects of extraneous, static object, and dynamic object stimulation on perception;
(b) Three experiments dealing with sensory-motor response (head torsion); and
(c) Two experiments on optical illusions.

Effects of Extraneous, Static Object, and Dynamic Object Stimulation on Perception

RESULTS. With respect to the first group of experiments there were:

1. *Changes in apparent verticality*, namely: (a) developmental changes in effect of body tilt on apparent verticality, that is, at the youngest ages the apparent vertical was tilted to the same side as body tilt whereas it was titled relatively to the opposite side of the body for the older children; (b) developmental changes in effect of starting position on apparent verticality, for example, irrespective of age level and body tilt, the physical position of the apparent vertical was rotated relatively to the left under left starting position and rotated relatively to the right under right starting position; the starting position effect was greatest at the youngest age level and decreased with increase in age.
2. *Changes in effect of asymmetrical extent and starting position on the apparent median plane*: (a) the position of the apparent median plane was located relatively in the direction to which the test square extends; and (b) the effect of asymmetrical extent is constant and very great for age levels 6 through 17 and then decreases sharply at the 18–19 levels. There was (a) an overall effect of starting position (relatively to left for left staring position and relatively right for right starting position); (b) the effect of starting position was greatest at the first two age levels becoming markedly smaller at the next age level, followed by a slight increase.
3. *Changes in effect of directional dynamics in pictured objects on the apparent median plane*: (a) The apparent median plane significantly shifts relatively opposite the direction of the directional dynamics; (b) There is a developmental trend in terms of a decrease in efficacy of directional dynamics with age.
4. *Changes in effect of directional dynamics in pictured objects (hands pointing up, down) on the position of the apparent horizon*: (a) There is an overall significant effect of directional dynamics with the position of the apparent horizon relatively opposite the direction of the dynamics; (b) a developmental trend was evident, namely, after a minimal effect at the first age level, there is an increase at the third year level followed by a decrease.
5. *Changes in effect of directional dynamics inherent in visually presented words on the position of the apparent horizon*: (a) There was no significant change with respect to downward versus upward words; (b) Independent of directional dynamics the apparent horizon was above the objective horizon for the youngest age group and, with increase in age, it significantly shifted below the objective horizon.
6. *Changes in effect of directional dynamics in pictured objects on perceived speed of motion.* (a) Pictured objects with directional dynamics were perceived as moving faster and (b) the youngest age group adjusted the dynamic figures at a relatively slower speed (dynamic figure perceived as moving faster) than figures without left-right dynamics and was followed by a developmental increase for the remaining age levels.

Sensory-Motor Response to Extraneous and Object Stimuli

RESULTS.

1. *Effect of asymmetrical light stimulation on head torsion*: (a) with asymmetrical light stimulation the head turns to the opposite side of simulation; (b) the difference in amount of head torsion linked to eye stimulation steadily decreased with age.
2. *Effect of asymmetrical extent on head torsion*: (a) there was a significant effect of asymmetrical extent with the head turning opposite the side of asymmetrical extent; and (b) developmentally, the difference is greatest at the first two age levels, least at 16–17 years, and some increase at the 18–19 year level.
3. *Effect of directional dynamics in pictured objects on head torsion*: (a) head torsion occurs in a direction opposite of the pointing hands; and (b) a general developmental trend, decrease with increase in age, was present.

Effects of Susceptibility to Visual Illusions

RESULTS.

1. Müller-Lyer Illusion: (a) the illusion is most effective at the first age level and decreased until the 13-year level where it remained the same until there was a slight increase at the 19-year level.
2. Titchener Circles illusion: (a) with increase in age there was a significant increase in susceptibility to the illusion.

Development of Individual Consistency

RESULTS. Individual consistency with respect to perception of verticality was derived from intercorrelational analyses of perception of verticality under two conditions: one was concerned with effect of body tilt, which in our conception represents variation of extraneous stimulation to the body, and the other with variation of object stimulation as assessed by the effects of the starting position of the rod.

As to correlations involving left versus right body tilt, individual consistency is reflected in negative correlations since the shift of apparent vertical is to the side opposite body tilt. With the exception of the 16–17 year level, there is a steady increase of negative correlations from 6–7 years to 18–19 years of age. Thus, individual consistency in regard to effect of body tilt on apparent verticality increases with increase in age.

With respect to starting position of the rod, individual differences in consistency would be reflected in negative correlations, that is, the more the person is affected by starting position to one side the more he or she should be affected by starting position to the opposite side. Positive correlations reflect consistency with respect to individual equilibrium. Since there is lack of evidence of consistency in effect of starting position, the developmental increase (from age 6 to 19) is

interpreted as a function of individual equilibrium which reflects the tendency of the individual to form a personal frame of reference.

Individual differences in position of the apparent horizon: (a) the apparent horizon shifted downward with an increase in age; and (b) parallel to the results for verticality, there occurred increasing individual consistency, which was regarded as a reflection of the development of personal frame of reference.

Ontogenetic Formation of a World of Constant Objects

Three issues are discussed, namely, perceptual constancy, adaptation, and ontogenetic developmental change.

Constancy

With respect to perception of verticality, according to sensory-tonic field theory of perception, Wapner and Werner (1957) noted:

> ...according to the first postulate of sensory-tonic theory, a particular perception is defined in terms of a particular "o:R:s" relationship; 2) constancy entails invariant perception despite variation of proximal stimulation; 3) thus, in order for perception to be invariant, variation of proximal stimulation must be accompanied by a concomitant change in organismic state so that the particular "o:s" relationship is maintained. (p. 53)

Adaptation

This process is characterized with reference to the subject adapting to an environment that is visually distorted through prism lenses that rotate the field so that a perpendicular line is rotated 30 degrees:

> ...before adaptation, for each posture the equilibrial axis is "non-congruent" with the proximal stimulus (unstable relationship): the proximal stimulus for each posture is deviating 30 degrees to the right with reference to the equilibrial axis. Under these conditions the ensuing perception is of a line tilted to the right... Our basic assumption concerning the adaptation process is that in time the equilibrial axis shifts under the proximal stimulation so that a new stable relationship or a new congruence becomes established between "o" and "s",... Under these new stable relationships the line is no more seen as tilted but vertical (Wapner & Werner, 1957, p. 61).

Developmental Findings

The findings have pertinence for the problem of the ontogenesis of a stable framework and a stable world. It was assumed that, at early stages of development, lack of differentiation between subject and object was manifest in

two forms, namely, "egocentricity" and "stimulus boundedness." Egocentricity is typically defined as determination of the object world through the self as referent...

Turning first to the problem of egocentric space, we may here point to suggested evidence that space is initially organized in sensory-motor, bodily terms (Piaget and Werner). Thus, at early age levels, an egocentric frame of reference is formed, which consists of "interpreting" the proximal stimulus in terms of the body (or body subsystems, e.g., head, or eyes) and its postural changes. Since proximal stimuli are referred to bodily posture, a stationary object will be experienced as changing in position with each postural change. In other words, such egocentric organization means lack of "thing-constancy."

The other manifestation of "object-self" undifferentiatedness is that of stimulus boundedness. Stimulus boundedness, which may be described as an inordinate adaptation to stimuli, again leads to a lack of "thing-constancy." Thus, the lack of "thing-constancy" may ensue from diametrically opposite determinants: (a) the external postural changes; or (b) the quickly adaptive, viz., internal organismic changes. Our fundamental assumption then was that, at early stages these two factors, posture and internal organismic state, operate unsystematically: either independently, or combinatory, or in fusion. Objective constancy emerges when these two factors become clearly articulated and related to each other in a systematic fashion (Wapner & Werner, 1957, p. 63).

It is also of interest that there is an increasing establishment of individual consistency, for example, a systematic error in position of apparent vertical. What was described as "individual equilibrium" can be interpreted as an individual frame of reference. That is, there is "the development of an individual frame of reference which consists in the establishment of a systematic relation between posture and equilibrial axis particular to the individual" (Wapner & Werner, 1957, p. 64). These developmental findings for ontogenesis also have bearing on regression that exists in schizophrenics and in brain-injured individuals.

INTEGRATION OF SENSORY-TONIC FIELD THEORY OF PERCEPTION WITH ORGANISMIC-DEVELOPMENTAL THEORY

The ontogenetic study of perceptual development (Wapner & Werner, 1957) was guided by both sensory-tonic field theory of perception and comparative developmental theory. After Werner and Kaplan (1963) systematized organismic-developmental theory, a step was taken to integrate the sensory-tonic formulations within the broader framework of organismic-developmental theory (Wapner & Cirillo, 1973; Wapner, Cirillo & Baker, 1969, 1971). Parallel to the sensory-tonic formulation of "extraneous" and "object" stimulation, "background" and "focal" stimulation were conceptualized as underpinning cognitive processes (sensorimotor, perceptual, and conceptual processes) more generally.

Three levels of what we now characterize as the "person-in-environment" system, (e.g., Wapner, 1987, Wapner & Demick, 1998, 1999, 2000) were distinguished, namely: at the lowest level, *sensori-motor action*, followed by *perceptual objectification*, and at the third level *experienced relations between percepts*. At the level of sensori-motor action, consider (Wapner, Cirillo, & Baker, 1969) a bilaterally symmetrical organism who is prepared for action while maintaining an erect posture in a physical environment characterized by a gravitational field. The state of balance may be disturbed in at least two ways: (a) through forces that may change postural equilibrium (e.g., physical pulls in a particular direction); and (b) through asymmetrical stimulation. That the mode of adjustment to such effects may vary is evident from Goldstein's (1942, 1960) work on patients with cerebellar lesions: patients with less potent cerebellar lesions may adjust by yielding whereas patients with more severe cerebellar lesions may fall down. In the normal organism there would be differential effects depending on the goals of the person, that is, whether attempting to maintain a stable postural orientation or turning toward the stimulation.

The holistic, organismic aspect of the theoretical approach pointed to the integration of other levels of the system and subordination of the sensori-motor action to perceptual ends in a system characterized by differentiation between: (a) focal stimulation and organismic state and (b) focal and background stimulation.

At the second level, *perceptual objectification*, there is no longer sole concern with postural equilibrium; rather, the state of the organism, as influenced by:

> ...background stimulation, is now conceived as the context to which focal stimulation, differentiated from this context, is related. Perception, we assume, presupposes a special orientation or intentionality (Brentano) that is, directedness toward the construction of an object. Objectification obtains to the degree that there is a phenomenal object which is a) distanced, i.e., localized at a perceived distance from the body in a space including both object and body, b) stabilized, i.e., experienced as permanent and possessing constant properties, and c) articulated, i.e., differentiated into parts and properties which are hierarchically organized (Wapner, Cirillo & Baker, 1969, p. 500).

In short, for *perceptual objectification*, the state of the organism serves as a context (body as background) to which focal stimulation is related. This makes for objectification; that is, the phenomenal object is distanced, stable, and articulated.

Given objectification of percept, we may consider the third level, namely, *experienced relations between percepts*. The relationship between a perceived body part and a perceived object may take place in two ways: "... the body part may be experienced as an instrument of action vectorially directed toward a thing experienced as the target of the vector (e.g., arm experienced as longer); in contrast, the body part may be experienced as the passive object of an impinging force originating out-there (e.g., arm experienced as shorter)" (Wapner, Cirillo, & Baker, 1969, p. 502; also Schlater, Baker & Wapner , 1969, 1981).

It is important to recognize that, with the emergence of the higher levels, the complexity of organization of the system as a whole increases with events at one level influencing all levels. For example, McFarland (1962) found that, while seated erect, inspection of a line titled 20 degrees for varying periods of time—2, 5, 10 minutes—a physically vertical rod was perceived as tilted left and the physically erect body was perceived as tilted right. Thus, asymmetry in proximal stimulation gives rise to an equilibrium process on the second level involving a change in organismic state. On the third level, the perceptual relation between body percept and thing percept changed, and moreover, on the first level during exposure, the body felt tilted or subjects wanted to tilt their body toward the line; that is, there was a tendency to initiate sensory-motor action on the first level.

CONCLUSION

This review of the sensory-tonic field theory of perception and the large variety of experimental findings that emerged under its aegis speaks to the positive impact of the "new look" on the theoretical analysis of perception. Most important, the sensory-tonic field theory of perception and the general developmental changes in perception obtained points to the general significance of "organismic states" and the need for their general elaboration in the analysis of human experience and action.

For further reformulation and future work, Wapner, Cirillo and Baker (1969) have suggested three factors to be considered:

> First... one must have a clear idea of which organismic subsystems are directly influenced by a given condition and how the organism as a whole adapts to this modification... Second... which mode of adjustment will occur depends on the task imposed, or the goal adopted by the organism... Finally... a thorough understanding of the processes involved in a given achievement requires the multi-faceted examination of the system as a whole and not exclusive concern with an encapsulated subsystem or level operation (Wapner, Cirillo, & Baker, 1969, pp. 508–509).

Thus, though the present analysis may serve as a step toward integrating sensory-tonic field theory with organismic-developmental theory, there remains the need to integrate the conceptualization presented here with the holistic, developmental, systems-oriented perspective (e.g., Wapner, 1987; Wapner & Demick, 1998) where the person-in-environment is regarded as the unit of analysis.

As a step toward achieving this goal, we may ask what is common to the sensory-tonic field theory of perception and the holistic, developmental, systems-oriented perspective? Both represent a transactionist approach in keeping with Dewey and Bentley (1949), who treat all of human behavior, including their most advanced knowings as "... activities not of himself alone nor even primarily his but as processes of the full situation of organism-environment." (p. 104) Transactionalism

is described by Altman and Rogoff (1987) as follows: "Relations of the aspects of the whole are not conceived of as involving mutual influences of antecedent-consequent causation. Instead, the different aspects of the whole co-exist as intrinsic and inseparable qualities of the whole." (p. 25)

Sensory-tonic field theory focuses on the relation between the state of the organism and sensory input from the environment. The holistic, developmental, systems-oriented perspective focuses on the person-in-environment as the unit to be analyzed, which also involves organismic state and various aspects of the environment. Thus, both approaches are linked to structural part-whole analyses such as the relations between stimulus input and state of the organism.

Both approaches assume teleological directedness insofar as transactions are not regarded as random but rather are directed toward short- and long-term goals. For example, the person may be directed toward the location of an object out-there, or may be directed toward self as object. Moreover, though persons functioning in the world out-there involves a spatio-temporal relation, the human can subordinate one aspect, e.g., space, and experience temporal change or vice versa can subordinate temporality and function with respect to spatial characteristics.

Both approaches assume that the person actively contributes to the cognitive process by constructing objects of perception, and more generally, by involvement in sensori-motor functioning as well as conceptual thought. This implies a capacity for multiple intentionality where the person can adopt different intentions with respect to self-world relations, that is, the experience of what is object or "figure" out-there (e.g., things both natural and constructed, people, a given societal organization, etc.), an emphasis on self or relation between self and objects out-there.

Given the formal, broadly conceived features of development as described in the orthogenetic principle, development can be applied to various features of a sensory-tonic analysis of perception as well as to the more general analysis of cognition, affect, value and action that is the concern of the holistic, developmental, systems-oriented perspective.

The holistic assumption points to the critical question of how perception is related to other aspects of cognition, and more generally how it is linked to affective processes, valuative processes, and action. With progress in characterizing the nature of the processes that underlie conceptual functioning as well as affective functioning, valuative functioning and action including the relations among all of these aspects of functioning, significant steps will have been taken in shaping a general theoretical approach that has relevance to very diverse aspects of human functioning. These and other assumptions common to both our early and more recent theoretical perspective can be found elsewhere (Wapner & Demick, this volume) which presents our current conceptualization of person-in-environment functioning across the life span with a focus on critical life transitions.

REFERENCES

Altman, I., & Rogoff, B. (1987). World views in psychology: Trait, interactional, organismic and transactional perspectives. In D. Stokols & I Altman (Eds.), *Handbook of environmental psychology* (pp. 7–40). New York: Wiley.

Blake, R. R., & Ramsey, G. V. (1951). *Perception: An approach to personality.* New York: Ronald Press.

Bruell, J. H., & Albee, G. W. (1955). Effect of asymmetrical retinal stimulation on the perception of the median plane. Perceptual and Motor Skills, 5, 133–139.

Bruner, J. S., & Goodman, C. C. (1947). Value and need as organizing factors in perception. *Journal of Abnormal and Social Psychology*, 42, 33–44.

Bruner, J. S., & Klein, G. (1960). The function of perceiving: New look retrospect. In B. Kaplan & S. Wapner (Eds.), *Perspectives if psychological theory* (pp. 161–177). New York: International Universities Press.

Carini, L. P. (1955). *An experimental investigation of perceptual behavior in schizophrenics.* PhD. Dissertation, Clark University. Microfilm No. 13009.

Comalli, P. E., Jr. (1955, April). Developmental study of physiognomic perception. Paper presented at Eastern Psychological Association Meetings, Philadelphia.

Comalli, P. E., Jr. (1960). Studies in physiognomic perception: VI. Differential effects of directional dynamics of pictured objects on real and apparent motion in artists and chemists. *Journal of Psychology, 49*, 99–109.

Comalli, P. E, Jr., Werner, H., & Wapner, S. (1957). Studies in physiognomic perception: III. Effect of directional dynamics and meaning-induced sets on autokinetic motions. *Journal of Psychology, 43*, 289–299.

Comalli, P. E., Jr., Wapner, S., & Werner, H. (1959). Perception of verticality in middle and old age. *Journal of Psychology, 47*, 259–266.

Dewey, J., & Bentley, A. F. (1949). *Knowing and the known.* Boston: Beacon Press.

Gibson, J. J., & Radner, M. (1937). Adaptation, after-effect and contrast in the perception of tilted lines. *Journal of Experimental Psychology, 20*, 453–467.

Glick, J. A. (1959). *The effects of static and dynamic extraneous stimulation on the apparent horizon.* MA Thesis, Clark University.

Glick, J. A. (1964). *An experimental analysis of subject-object relationships in perception.* PhD. Dissertation, Clark University. Microfilm No. 64-1360. (For condensed version see S. Wapner and B. Kaplan (Eds.), *Heinz Werner*, 1890–1964, pp. 71–76 and Chapter 5, pp. 458–461 in R. N. Haber (Ed.), *Contemporary Theory and Research in Visual Perception.*)

Goldman, A. E. (1953). Studies in vicariousness: Degree of motor activity and the autokinetic phenomenon. *American Journal of Psychology, 66*, 613–617.

Goldstein, K. (1942). The two ways of adjustment of the organism to cerebral defects. *Journal of Mount Sinai Hospital*, 9, 504–518.

Goldstein, A. C. (1955). *An experimental study of depth perception from the viewpoint of the sensory-tonic field theory of perception.* PhD. Dissertation, Clark University. Microfilm No. 13014.

Goldstein, A. G. (1959). Linear acceleration and apparent distance. *Perceptual and Motor Skills, 9*, 267–269.

Goldstein, K. (1960). Sensory-tonic theory and the concept of self realization. In B. Kaplan and S. Wapner (Eds.), *Perspectives in psychological theory.* New York: International Universities Press.

Humphries, Ogretta. (1959). *Effect of articulation of finger-tip through touch on apparent length of outstretched arm.* MA Thesis, Clark University.

Hurwitz, Irving. (1954). A developmental study of the relationships between motor activity and perceptual processes as measured by the Rorschach test. Microfilm No. 9011.

Isaac, D. M. (1958). *The effect of interpersonal feelings on psychological distance.* MA Thesis, Clark University.

Jaffee, K. (1952). *Effect of asymmetrical position and directional dynamics of configurations on the visual perception of the horizon.* MA Thesis, Clark University.

Kaden, S. F., Wapner, S., & Werner, H. (1955). Studies in physiognomic perception: II. Effect of directional dynamics of pictures, objects and of words on the position of the apparent horizon. *Journal of Psychology*, 39, 61–70.

Kruger, A. K. (1954). *Direct and substitutive modes of tension reduction in terms of developmental level: An experimental analysis by means of the Rorschach test.* PhD. Thesis, Clark University. Microfilm No. 9013.

Krus, D., Wapner, S., & Freeman, H. (1958). Effects of reserpine and iproniazid (marsilid) on space localization. *AMA Arch. Neurol. and Psychiat., 80*, 768–770.

Krus, D. M., Werner, H., & Wapner, S. (1953). Studies in vicariousness: Motor activity and perceived movement. *American Journal of Psychology, 66*, 603–608.

Liebert, R. S., Werner, H., & Wapner, S. (1958). Studies in the effect of lysergic acid diethylamide (LSD-25): Self- and object-size perception in schizophrenic and normal adults. *AMA Archives of Neurology and Psychiatry, 79*, 580–584.

McFarland, J. H. (1962). Visual and proprioceptive changes during visual exposure to a tilted line. *Perceptual and Motor Skills, 15*, 322.

McFarland, J. H., Werner, H., & Wapner, S. (1962). The effect of postural factors on the distribution of tactual sensitivity and the organization of tactual-kinesthetic space. *Journal of Experimental Psychology*, 63, 148–154.

Miller, A. (1959). *An experimental study of the role of sensori-motor activity in the retention of verbal meaning.* PhD. Thesis, Clark University. Microfilm No. 59-6192.

Miller, A. (1963). Verbal satiation and the role of concurrent activity. *Journal of Abnormal and Social Psychology, 66*, 206–212.

Misch, R. C. (1954). *The relationship of motoric inhibition to developmental level and ideational functioning: An analysis by means of the Rorschach test.* PhD. Thesis, Clark University. Microfilm No. 9016.

Rosenblatt, B. P. (1956). The influence of affective states upon the body ilnage and upon the perceptual organization of external space. Microfilm No. 18076.

Schlater, J., Baker, A. H., & Wapner, S. (1969, April). *Body perception as a function of self-world orientation.* EPA Meeting, Philadelphia, PA.

Schlater, J. A., Baker, A. H., & Wapner, S. (1981). Apparent arm length with active versus passive touch. *Bulletin of the Psychonomic Society, 18*, 151–154.

Sziklai, C. (1961). *Effect of body position and muscular strain on space localization, as measured by the apparent eye-line.* MA Thesis, Clark University.

Wapner, S. (1961a). An experimental and theoretical approach to body image. In Proceedings of the XVI International Congress of Psychology, Bonn, 1960. *Acta Psychologica, 19*, 758–759.

Wapner, S. (1961b). *Perceptual properties of one's own body and its relation to that of other objects (1961).* Symposium on Body Image and Pathological States, VA Hospital, Houston, TX, June.

Wapner, S. (1963). Some aspects of a research program based on an organismic-developmental approach to cognition: Experiments and theory. A condensed version of this paper was presented at a meeting of the American Academy of Child Psychiatry, Hershey, PA, 21 September.

Wapner, S. (1964a). An organismic-developmental approach to the study of perceptual and other cognitive operations. In C. Scheerer (Ed.), *Cognition: Theory, research, promise*, (pp. 6–44). New York: Harper & Row.

Wapner, S. (1964b). Some aspects of a research program based on an organismic—developmental approach to cognition: Experiments and theory. *Journal of the Amrerican Academy of Child Psychiatry, 3*, 193–230.

Wapner, S. (1968). Age changes in perception of verticality and of the longitudinal body axis under body tilt. *Journal of Experimental Child Psychology, 6*, 543–555.

Wapner, S. (1969). Organismic-developmental theory: Some applications to cognition. In J. Langer, P. H. Mussen & M. Covington (Eds.), *Trends and issues in developmental psycho1ogy*, 38–67. New York: Holt, Rinehart & Winston.

Wapner, S. (1987). A holistic, developmental, systems-oriented environmental psychology: Some beginnings. In D. Stokols & I. Altman (Eds.), *Handbook of environmental psychology* (pp. 1433–1465). NY: Wiley.

Wapner, S., & Cirillo, L. (1973). *Development of planning* (Public Health Service Grant Application). Worcester, MA: Clark University.

Wapner, S., Cirillo, L., & Baker, A. H. (1969). Sensory-tonic theory: Toward a reformulation. *Archivio di Psicologia Neurologia e. Psichiatria, 30,* 493–512.

Wapner, S., Cirillo, L., & Baker, A. H. (1971). Some aspects of the development of space perception. In J. P. Hill (Ed.), *Minnesota Symposia on Child Psychology,* (Vol. 5), 162–204. Minneapolis: University of Minnesota Press.

Wapner, S., & Demick, J. (1980). Effect of environmental relocation upon members of a psychiatric therapeutic community. *Journal of Abnormal Psychology, 89,* 444–452.

Wapner, S. & Demick, J. (1998). Developmental analysis: A holistic, developmental, systems-oriented perspective. In R. M. Lerner (Ed.), *Theoretical models of human development. Vol. 4 Handbook of child psychology* (5th ed., Editor-in-chief: William Damon). New York: Wiley.

Wapner, S. & Demick, J. (1999). Developmental theory and clinical child psychology: A holistic, developmental, systems-oriented approach. In W. K. Silverman & T. H. Ollendick (Eds.), *Developmental issues in the clinical treatment of children and adolescents.* Boston: Allyn & Bacon.

Wapner, S., & Demick, J. (2000). Assumptions, methods, and research problems of the holistic, developmental, systems-oriented perspective. In S. Wapner, T. Yamamoto, & H. Minami (Eds.), *Theoretical perspectives in environment-behavior research: Underlying assumptions, research problems and methodologies* (pp. 7–19). NY: Kluwer-Plenum.

Wapner, S., & Krus, D. (1960). Effects of lysergic acid diethylamide, and differences between normals and schizophrenics on the Stroop Color-Word Test. *Journal of Neuropsychiat., 2,* 76–81.

Wapner, S., McFarland, J. H., & Werner, H. (1962). The effect of postural factors on the distribution of tactual sensitivity and the organization of tactual-kinesthetic space. *Journal of Experimental Psychology, 63,* 148–154.

Wapner, S., McFarland, J. H., & Werner, H. (1963). Effect of visual spatial context on perception of one's own body. *British Journal of Psychology, 54,* 41–49.

Wapner, S., & Werner, H. (1955a). Margin of safety: Changes in psychological distance under danger. [Silent film]. (See III-1)

Wapner, S., & Werner, H. (1955b). Changes in psychological distance under conditions of danger. *Journal of Personality, 24,* 153–167.

Wapner, S., & Werner, H. (1957). *Perceptual development.* Worcester, MA: Clark University Press.

Wapner, S., & Werner, H. (1965). An experimental approach to body perception from the organismic-developmental point of view. In S. Wapner & H. Werner (Eds.), *The body percept.* New York: International Universities Press.

Wapner, S., Werner, H., & Chandler, K. A. (1951). Experiments on sensory-tonic field theory of perception: I. Effects of extraneous stimulation on the visual perception of verticality. *Journal of Experimental Psychology, 42,* 341–345.

Wapner, S., Werner, H., & Comalli, P. E., Jr. (1956). Space localization under conditions of danger. *Journal of Psychology, 41,* 335–346.

Wapner, S., Werner, H., & Comalli, P. E., Jr. (1958). Effect of enhancement of head boundary on head size and shape. *Perceptual and Motor Skills, 8,* 319–325.

Wapner, S., Werner, H., & Krus, D. M. (1957a). Studies in physiognomic perception: IV. Effect of muscular involvement on the properties of objects. *Journal of Psychology, 44,* 129–132.

Wapner, S., Werner, H., & Krus, D. M. (1957b). The effect of success and failure on space localization. *Journal of Personality, 25,* 752–756.

Wapner, S., Werner, H., & Morant, B. (1951). Experiments on sensory-tonic field theory of perception: III. Effect of body rotation on the visual perception of verticality. *Journal of Experimental Psychology, 42,* 351–357.

Werner. H. (1937). Process and achievement: A basic problem of education and developmental psychology. *Harvard Educational Review*. 7, 353–368.

Werner, H. (1940). *Comparative psychology of mental development*. New York: International Universities Press. (Originally published in German, 1926 and in English, 1940).

Werner, H., & Kaplan, B. (1956). The developmental approach to cognition: Its relevance to the psychological interpretation of anthropological and ethno-linguistic data. *American Anthropologist, 58*, 866–880.

Werner, H., & Kaplan, B. (1963). *Symbol formation*. New York: Wiley.

Werner, H., & Wapner, S. (1949). Sensory-tonic field theory of perception. *Journal of Personality, 18*, 88–107.

Werner, H., & Wapner, S. (1952). Toward a general theory of perception. *Psychological Review, 59*, 324–338.

Werner, H., & Wapner, S. (1952a). Experiments on sensory-tonic field theory of perception: IV. Effect of initial position of a rod on apparent verticality. *Journal of Experimental Psychology, 43*, 68–74.

Werner, H., & Wapner, S. (1952b). Experiments on sensory-tonic field theory of perception: V. Effect of body status on the kinesthetic perception of verticality. *Journal of Experimental Psychology, 44*, 126–131.

Werner, H., & Wapner, S. (1954). Studies in physiognomic perception: I. Effect of configurational dynamics and meaning-induced sets on the position of the apparent median plane. *Journal of Psychology*, 38, 51–65.

Werner, H., & Wapner, S. (1955). The Innsbruck studies on distorted visual field in relation to an organismic theory of perception. *Psychological Review, 62*, 130–138.

Werner, H., & Wapner, S. (1956b). Sensory-tonic field theory of perception. *Revista di Psicologia, 50*, 315–337.

Zener, K. (Ed.). (1949a). Interrelations between perception and personality: A symposium: Part I [Special issue]. *Journal of Personality, 18*(1).

Zener, K. (Ed.). (1949b). Interrelations between perception and personality: A symposium: Part II [Special issue]. *Journal of Personality, 18*(2).

Part III

The World at Clark

Development of the Context

7

THE CLARK YEARS: CREATING A CULTURE

Jennifer M. Lane, Mariola Magovcevic and *Becca K. Solomon*

> Heinz was always very courtly, sort of old-world European—soft-spoken, kindly. He could be demanding but it was always, in my experience at least, very gracious and civil. (S.R. Vogel, personal communication, May 3, 2002).

Almost 40 years after his death, Heinz Werner's impact on the lives and work of his former students and colleagues at Clark University is unquestionable. Arnold Miller has a room dedicated to Werner at his school for autistic children in Jamaica Plain, Massachusetts, Edith Kaplan carries a picture of Werner around with her, Bernard Kaplan has Werner's photo hanging on the wall of his home office, Seymour Wapner created a library at Clark that contains Werner's manuscripts, literary papers, and publications, Robert Baker keeps a piece of paper of Werner's doodling, and William Vogel gets choked up when talking about his experiences with him. This chapter will explore the effects of Heinz Werner's influence on the Clark psychology department, both in terms of interpersonal relations and professional influence.

NEW BEGINNINGS: CLARK UNIVERSITY AT THE TIME OF WERNER'S ARRIVAL

The president of Clark University from 1946–1967 was philosopher and theologian Howard Bonar Jefferson. His leadership marked a time of great growth and optimism for Clark, especially because, in contrast, in the prior 25 years under President Atwood the university had experienced "less than brilliant administrative

leadership" (Jefferson as cited in Koelsch, 1987, p. 165). Though Atwood had left the university largely in decline, Jefferson discovered that the intellectual uniqueness and excitement that had characterized Clark's early years was evident in many faculty, graduate students, and undergraduates (Koelsch, 1987).

Jefferson was an eloquent speaker and authoritative leader. These traits along with his respect for Clark's history and his faith in its possibility were great assets to improving the university. This era at Clark was characterized by a sense of new beginnings and strong community. Jefferson encouraged innovation, tried to better use resources within the university, and enhanced morale, for example, by establishing a tradition of evening faculty discussions known as "smokers" to tackle difficult issues in an informal atmosphere (Koelsch, 1987, p. 170).

The university's student body ballooned from 1947 to 1950 because of returning World War II veterans, as well as a nationwide rise in college attendance. At the same time, Jefferson was focused on increasing female undergraduate enrollment, which had only begun in 1942. The enlarged student body combined with the retirement and departure of several faculty members meant that staff expansion was crucial for both graduate and undergraduate programs. Jefferson, then, began his presidency by appointing a record number of faculty members, most of whom continued on during his long leadership of the university (Koelsch, 1987).

Rebuilding the psychology department was one of the tasks Jefferson viewed as most important to accomplish as president. He found the department, which had been one of the most distinguished in the country under G. Stanley Hall's leadership, "seriously weakened" (Jefferson, 1972). Many prominent psychologists had come and gone over the years.[1]

Most relevant to the department's decline was President Atwood's merging of psychology and education in 1926 under the chairmanship of educational psychologist, Vernon Jones. Jones' interest was primarily in teacher training and in character/citizenship education, leaving a void in psychological study (Jefferson, 1972). One former student also suggested that Jones was not the most inspiring of teachers. Most illustrative was his example of Jones calling a meeting of the graduate students after a particularly severe snowstorm and right before they all left for the winter vacation in 1948: Jones asked the students to drive very carefully because accidents would reflect poorly on the university. Still, there was some resentment among those who had gotten to know Jones when he was pushed out of his position as chair of the combined psychology and education department (R. Baker, personal communication, March 29, 2002). When Walter Hunter, an esteemed early behaviorist who had joined the Clark faculty in 1925 as the G. Stanley Hall Professor of Genetic Psychology, resigned in 1936, the Hall chair remained essentially empty for a decade.[2] In 1946, President Atwood had appointed Roger

[1] These scholars included E.G. Boring, John Paul Nafe, Clarence Graham, Wolfgang Köhler (as visiting professor), Karl Buehler, and Robert Brown (Koelsch, 1987).

[2] Karl Buehler occupied the Hall chair briefly in the 1940s (Koelsch, 1987).

Barker of Stanford to the Hall chair, but Barker left the following year to head the University of Kansas psychology department. His departure was reflective of the university's difficulty in securing deserving occupants to this chair (Koelsch, 1987).

Jefferson's two main objectives then were to appoint a worthy scholar to the Hall professorship, and to create a separate psychology department in order to re-establish the visibility of psychology at Clark and in the field. In the summer of 1947, Jefferson met Heinz Werner at the University of Michigan, Ann Arbor where Werner was a guest lecturer. Jefferson persuaded him to join the faculty in 1947 as Professor of Psychology and Education, and later after the separation of psychology and education in 1949, appointed him as the G. Stanley Hall Professor of Genetic Psychology (April, 1949) and chair of the newly independent psychology department (Fall, 1949) (Franklin, 1990, and in this volume). Werner's work in comparative psychology had already been well established in the international community as one of the leading pieces of theoretical and empirical work on human mental development.

Werner was drawn to Clark because of his admiration for G. Stanley Hall (Jefferson, 1972). In addition, after working productively in the United States since his arrival in 1933, he was finally being offered the distinguished position that his scholarship warranted (Franklin, 1990, and in this volume). On the advice of a visiting committee, Jefferson built the psychology department around Werner, who served as chair of the newly revitalized psychology department until his retirement in 1960. Werner's presence restored the psychology department to its "position of eminence" (Jefferson, 1972). He reinstituted Ph.D. graduate training in the department, drew faculty and students to Clark, and facilitated a rich intellectual climate (Witkin, 1965).

REBUILDING CLARK'S PSYCHOLOGY DEPARTMENT

When Werner arrived at Clark, the combined psychology and education department had only two graduate students, one full professor (Chair–Vernon Jones), two associate professors (Robert Brown and John E. Bell), and a visiting psychology professor (Sigmund Koch) (Franklin, 1990, and in this volume; Koelsch, 1987). Werner almost immediately (January, 1948) recommended to President Jefferson that he invite his Brooklyn College colleague and collaborator on the study of perception, Seymour Wapner, to join the Clark faculty. Thelma Alper also arrived from Wellesley in 1948 to direct the clinical program. The next year, behaviorist Gordon Gwinn came from Wesleyan (Jefferson, 1972). Between 1947 when Werner joined the department and 1960 when he retired, Clark's Psychology Department had grown from 7 to 23 faculty members (Franklin, 1990). Graduate students began entering the psychology department in increasing numbers following Werner's arrival in 1947. They had usually been directed toward Clark by mentors who knew and respected Werner's work (Franklin, 1990). Other students interested in clinical

work were drawn by the department's affiliation with Worcester State Hospital, known in New England as a strong institution (Koelsch, 1987).

Following the separation of the education department from the psychology department, Vernon Jones was appointed chair of the education department, and removed from the psychology department. Heinz Werner, as the psychology department's new chair, began a series of reforms that led to the re-establishment of Clark as a leading institution for graduate study of psychology. During his time as chair of the department, Werner worked to preserve the reputation of the institution by recruiting prominent psychologists from different areas of psychology including family relations, psychopathology, perceptual development, and symbol development.

Integration of research ideas was an important concept for Werner. To enhance the diversity of ideas, he went out of his way to hire professors of psychology who held very different views from his own. Such professors included empiricist and clinician Morton Wiener and behaviorist Gordon Gwinn. It is important to note that while these professors came from different theoretical perspectives they shared Werner's vision of psychology based on rigorous scientific method with strong theoretical bases.

The already existing ties between Clark's psychology department and the Worcester State Hospital were strengthened under President Jefferson and Werner, and a cooperative program in clinical psychology was established in 1948. Additional collaborative arrangements were made with other Worcester and Boston area institutions, including: the Worcester Foundation for Experimental Biology, the Worcester Youth Guidance Center, the Worcester public school system, the Judge Baker Guidance Center (Boston), the Walter Fernald School (Boston), and the Boston-area Veterans Administration hospital. These associations added distinguished affiliated clinical faculty to Clark's psychology department[3] as well as broad opportunities for clinically oriented students (Koelsch, 1987).

Werner was able to bring to the department what had been lacking for several years: leadership and prominence. He rebuilt a distinctive department of psychology at Clark, joining Hall's genetic approach with the experimental tradition. He provided his students with a way of questioning experimental data, and freedom to question without imposed limits. Similarly, it is said that Werner incorporated the procedure-oriented approach of American psychology (e.g., studying the maze learning of rats) with the problem-oriented approach of German psychology (e.g., considering what the maze means to the rats) (Iritani, 1965). Though he was critical of the American psychology's emphasis on product, his genuine affinity for both experimental and philosophical pursuits in his work eased his transition to working in the states (Witkin, 1965).

[3] "Affiliate" clinical faculty members included Dr. Rodnick, of Worcester State Hospital, Dr. Weinreb, of Worcester Youth Guidance Center, and Edith Meyer of the Boston Children's Hospital (Jefferson, 1972).

WERNERIAN THINKING TAKES ROOT

Witkin states that Werner's years at Clark were "among the happiest and most productive of his [Werner's] life." He devoted himself to research on perception and language. His work on perception, in particular the sensory-tonic field theory of perception, was conducted with Seymour Wapner and their students (Witkin, 1965, p. 311), supported by a government grant where Werner and Wapner were co-principal investigators for fifteen years. Werner's work on language and symbol formation was conducted with his student, and later colleague, Bernard Kaplan (Witkin, 1965).

Perhaps one of the most accurate descriptions of Heinz Werner's work both during the Clark era and before, comes from one of his former students, Jan Bruell, who claimed that Werner was "a master of the ***experimentum crucis***, the critical demonstration that makes a point" (Bruell, 1966). For anyone who has read Werner's major work, *Comparative Psychology of Mental Development* (1927), there can be no doubt of the accuracy of this description. This seemed to be his philosophy in running the Clark department. He placed a great deal of emphasis in experimental work, yet this work was built upon the foundation of years of philosophical theorizing.

Heinz Werner's developmental theories, developed during his years in Germany and carried through to the Clark Era, were theories that allowed for the explanation of a wide variety of phenomena. It was the breadth of his theories that allowed doctoral students to incorporate them into a wide number of research areas including: sensory-tonic perception, symbol formation, schizophrenia, and language.

When Werner arrived at Clark in 1947 he was already 57 years old and had spent some of his most productive years in Germany. During the Clark years the bulk of his productivity could be accounted for through collaborative efforts with others. Werner arrived at Clark with theoretical ideas that were carried out in large part by those to whom he was close. His collaborators included Seymour Wapner [e.g., "Sensory-tonic Field Theory of Perception" in the *Journal of Personality, 18*:88–107; *Perceptual Development* (1957)]; Roger Bibace [e.g., "The cognition of magnitude: A comparative study of normals and schizophrenics," Unpublished doctoral dissertation, Clark University (1957)]; Bernie Kaplan [(e.g., "Introduction to Bibliography and Addenda" in W. Stern, *Allegemeine Psychologie* (1950)]; Edith Kaplan [e.g., "Development of Word Meaning through Verbal Context: An Experimental Study" in *Journal of Psychology, 29*: 241–257; The Acquisition of Word Meanings: A Developmental Study (1952)], Robert Baker ["The acquisition of verbal concepts in schizophrenia: a developmental approach to the study of disturbed language behavior," Unpublished Doctoral dissertation, Clark University, (1953)]; Joseph McFarland ["Relation between perceived location of objects and perceived location of one's own body" in *Perceptual & Motor Skills* 15(2): 331–341 (1962)]; Donald Krus (e.g., and Wapner, S. "Studies in Vicariousness: Motor Activity and Perceived Movement" in *American Journal of Psychology, 66*: 603–608); Arnold Miller (e.g., and

Wapner, S. on "Studies in Physiognomic Perception: V. Effect of Ascending and Descending Gliding Tones on Autokinetic Motion. *Journal of Psychology, 46*: 101–105); and Peter Comalli (e.g., and Wapner, S. "Perception of Part-whole Relations in Middle and Old Age" in *American Psychologist, 14*: 349). While in part his tendency to collaborate in later years may have been due to a decline in productivity and increased administrative responsibilities, it also demonstrates the generosity of spirit Werner had as a scholar and mentor. It only helped fledgling students and younger colleagues to link their names to that of an eminent psychologist.

THE DIFFERENTIATION AND INTEGRATION OF RESEARCH IN THE DEPARTMENT

Former graduate students remember the Werner years at Clark as a period in which Kaplan's and Wapner's two areas of research seemed predominant in the department: research in expressive-symbolic processes, and research into perceptual processes. Both of these areas of research expanded upon Werner's earlier work in Germany and encompassed some of underlying concepts discussed in his major work, *Comparative Psychology of Mental Development* (1940 and 1947).

The two research areas embodied what many believed to be the two sides of Heinz Werner, the philosophical idea-man, and the more procedural, methodological experimenter. These two sides represented the types of differences present between American and German psychologies in the 1950s. American psychology was predominantly a psychology of numbers and experiment. There was a focus on using statistical methods and experimental rigor to prove your thesis. This American emphasis on the actuarial dates back to Puritan times, but gained an even stronger hold as the behaviorist movement was gathering increased momentum from 1930–1950 (Cohen, 1982). In contrast in Europe, psychology was much more philosophically oriented.

A third area of research that also gained some prominence in later years was Tamara Dembo's innovative work in the area of rehabilitation psychology. When Tamara Dembo joined Clark in 1952, the department was already under the direction of Heinz Werner. Like Werner, Dembo arrived at Clark with a reputation as a psychologist and researcher of considerable international repute. During her time at Clark she collaborated with Werner on a number of projects that expanded upon her earlier theoretical work. The two professionals shared similar feelings about the importance of theory-driven methodological work; however, there seemed to be little integration of theoretical philosophies (De Lima, 1999).

Despite the fact that during the Werner years at Clark, much of the research used Wernerian concepts to explain various phenomena, there seemed to be little integration of the different areas. Len Cirillo remembers that there was little integration of ideas between Wapner and Kaplan's research groups despite the fact that they shared many theoretical concepts. Cirillo explained that while Werner and several others took part in both research groups, there was no integration at

the level of leadership (personal communication, April 1, 2002). This seemed to be a common theme in the department at the time. Those involved in clinical work also incorporated Wernerian thinking into their clinical work yet they remained separate from both the sensory-tonic and symbol formation groups. As student and professor, Bernie Kaplan led a research group of developmental psychologists and constructivist philosophers who conducted complicated theoretical research on symbol formation. Wapner was the experimentalist: it was so easy to get studies going as a member of his lab group that he was renowned for getting students through to the doctoral degree. Several former students have commented on the prestige enjoyed by students in both of these research groups (R. Bibace, personal communication, November 12, 2001).

At the same time, Werner's philosophy in the department seemed to encourage integration of ideas. Werner's desire for theoretical integration was evident during his early years at Clark. According to Bernie Kaplan:

> The chair of the department was Vernon Jones, an educational psychologist. A manifest embodiment of what psychoanalysts call an obsessive-compulsive personality. I recall the first meeting we had in his home. He took out a little bell that he tinkled to call us all to attention, and then asked us to go around the room, announcing our names and our specializations. The different people, students and faculty, would recite their names and then boom out "clinical", "personality", "developmental", "experimental", "social", etc. I can still recall his coming to Heinz Werner. Werner was very concise. First, he gave his name. And he then said, "I am a psychologist". No elaborations, no qualifications (Kaplan Josephs & Bhatia, this book, [pp. 127–128]).

Later, when Werner became chair he was responsible for creating several interdisciplinary seminars in which he incorporated other departments at Clark. In 1953 he proposed one such seminar on the study of metaphorical language in which participants from a number of different disciplines were included. This seminar was part of a larger cooperative effort to study the manifestations of metaphorical language. Participants included Robert Baker, then professor of clinical psychology; Tamara Dembo, professor of social psychology; Bernard Kaplan, professor of developmental psychology; Richard Harrell, professor of romance languages and general linguistics; Richard Reid, professor of romance languages and general linguistics; William Carter, professor of English, and Robert Beck, professor of philosophy. In the final report submitted by Werner he wrote that the purposes of the seminar were "to present to the members of each discipline the approach to the problem of metaphor of the other discipline; 2) to train graduate students to formulate problems in such as way as to permit empirical and precise experimental study; and 3) to allow for the execution of actual empirical, experimental research" (Werner, 1953, p. 1). While there seemed to be a push in the department toward integrating various aspects of psychology and other disciplines, within the department itself, research groups using similar developmental concepts seemed to have little communication with each other.

Toward the end of Werner's reign as chair, the department had become increasingly more ingrained and this led to problems with the American Psychological Association. In particular, a large number of former students went on to become professors in the department. This scenario seemed to discourage individuality of theoretical thinking. Everything was looked at from a developmental perspective and new students arrived at a department in which half of the professors came from the same educational and theoretical background. This enmeshment of ideas could have partially accounted for why Werner's ideas did not seem to spread far beyond the Clark campus, though enmeshment certainly did not seem to be Werner's intention. In his classes, he encouraged his students to think critically. He also tried to build a department based on diverse theoretical viewpoints, for example, he pushed for the hiring of Mort Wiener, a psychologist who had a drastically different perspective from his own. Wiener, for example, described himself as more of a behaviorist than a developmentalist, while Werner's approach was clearly developmental. Wapner describes the atmosphere at Clark in the 1950s as exciting intellectually. He describes heated arguments between behaviorists like Gordon Gwinn and developmentalists (S. Wapner, personal communication, February 18, 2002).

THE CLINICAL QUESTION

In the United States during the 1940s and 50s, criticism of Clinical Psychology's focus on psychoanalytic theory led to more empirically based methods of inquiry.[4] This attitude was prevalent in the Clark Psychology Department as well, stemming in part from the general disposition of the field in the United States and in part from Werner's emphasis on sound experimental/quantifiable work.

While Werner came from a European background that emphasized conceptual frameworks over methodology, the zeitgeist of American psychology pushed him to focus more on empirical reporting of data. Statistics has been claimed to have become the orthodox scientific method in America in the 1950s (Valsiner & van der Veer, 2000). The importance of statistics as "the method" for scientific discovery is evident in the stories told by former Clark students. William Vogel recalls

[4] During this era, there were dramatic, though somewhat contradictory, changes to clinical psychology in the United States. The end of World War II prompted important shifts as troubled veterans returned home and required psychological treatment. The increased need for mental health care professionals as well as the amplified university enrollment due to the GI Bill led to tremendous academic expansion. Because of the country's loyalty to support war veterans, the Veterans Administration (VA), the National Institute of Mental Health, and the United States Public Health Service began funding clinical psychology. One result of this funding was that doctoral students in American Psychological Association approved psychology departments could work at the VA. The VA would then pay that student's stipend, relieving the psychology department of this financial burden. While there was a great need for clinical psychologists in the US during this time, psychology was under fire from logical positivists as not being scientific. Psychoanalysis was the predominant theory in practice. Historically, psychology grew out of philosophy, and had only recently begun to separate itself and move towards more "scientific" processes that could be hypothesized and proven in experiments. (R. Bibace, personal communication, November 12, 2001).

spending hours in a hot room with Arnold Miller trying to run analyses of variance (ANOVAs) with the use of the newly invented desk calculator.[5] The advent of the desk calculator, while tedious to utilize, allowed for greater precision in the reporting of research results. The technological advances that were predominant in the 1950's and spurred on by the race to space between the U.S. and the U.S.S.R. reinforced the need for mathematical data in social and behavioral research (O'Neill, 1986).

Bill and Susan Vogel who were both students at Clark during the time Werner was chair claimed that what Werner truly valued was not the specific area of research that a student became involved in, but rather the rigor of the student's work (W. Vogel & S.R. Vogel, personal communication, May 3, 2002). They described Werner as a person who differentiated between intellectual and scientific rigor, and as his student you could win his approval either way. Heinz Werner believed that in order for clinical work to be considered of value it must meet certain scientific standards. Much of the clinical work that was being done at that time was not considered scientifically rigorous.

At the same time, both graduate students and faculty recognized that under Werner's vision for the new department, developmental areas of research took precedence over clinical work. In most cases, the clinical students who gained recognition at Clark were those who were able to integrate aspects of Wernerian thinking into their research work. One former clinical student described a feeling of inadequacy that hung over many students doing research in clinical psychology.

Some students commented that clinical psychology at Clark was not only disparaged for its lack of scientific rigor in research, but because of its potential for financial gain through practice. According to Arnold Miller,

> The clinical group always had an aura about it of being faintly illicit because it was concerned with money, and you were developing into practitioners and you were going to make a lot of money, and somehow in Werner's world view that was not nice. So you always had to overcome that with Werner if you were a clinician. The only way you could get past it is if you did a dissertation that was not purely clinical. (A. Miller, personal communication, April 1, 2002).

[5] "In those years, the ultimate in technical sophistication was the desk calculator and if you were doing an analysis of variance, you could do three analyses of variance in the 40 hour week if you were using the desk calculator. And Arnie Miller and I were on some hot August evening and we were working on our theses and using the desk calculator and it was about midnight. There was no air conditioning and we were sweating and it was a mess and if you made a mistake doing the analysis of variance you only knew at the end because the figures didn't add up so you had to start it all over again. And Roger [Bibace] came walking into the room, laughing and chuckling and within the next few minutes he came closer to death than he's ever been since. He said, 'you know I just met with our statistical consultant' and we said 'marvelous Roger.' He said, 'do you know the statistical test I have to use on my dissertation?' And we said 'no Roger what statistical test?' He said 'the Sign test.... All I have to do is count to 30.' And I looked at Arnie and he looked at me and the same thought occurred to us both. Let's pick up this little *** and throw him out the window." (W. Vogel, personal communication, May 3, 2002).

Other students suggest that the derision towards clinical work did not come from Werner, but from other clinical faculty members. In fact, former student Roger Bibace explains Werner's regard for clinical psychology saying, "Werner had a kind of love affair with psychoanalysis" and counted Freud as well as Kant as his intellectual base (R. Bibace, personal communication, July 7, 2002).

DEPARTMENTAL POLITICS: PROFESSIONAL ALLIANCES AND CONFLICTS

Many of Werner's students and colleagues described Werner as the driving force behind the department's attempt at achieving harmony between faculty members and students. He is described by those who knew him as a compassionate man who placed great importance on the use of communication to work through faculty and student conflicts. In his autobiography, Richard Lazarus[6] claimed that while attempts were made to avoid tensions between faculty members, the social atmosphere in the Clark Department reflected the behavior of most close-working professional groups with its share of power struggles, resentments, and ego-conflicts. He wrote:

> Inevitably, however, there were power struggles and resentments, and I considered it part of my job to deal with them as constructively as possible. Occasionally deprecatory comments about this or that individual would crop up as one ambitious affiliate of the department would try to upstage another, or a regular member would seek more power than others welcomed.

Some of Werner's students pointed to contention between him and some of the clinical faculty. There was a pressure by Werner to hire clinicians who were scholars, and he seemed to have little regard for those clinicians who were not publishing frequently and conducting research. Thus, despite his reputation as peacekeeper among the faculty in the department, Werner had strong opinions regarding certain faculty members.[7]

Several former students described differences between Werner and clinician John Elderkin Bell. Bell was a holdover from the era in which the education and psychology departments were united at Clark; in fact Bell held a Doctor of Education in Counseling Psychology, not a Ph.D. in Clinical Psychology. At this time, psychologists wanted to make a clear-cut departure from education, and many viewed education as "a laugh" rather than a serious discipline (R. Bibace, personal communication, July 7, 2002). During Bell's lifetime he made great contributions to psychoanalytic field and family therapy areas,[8] but he published very little and was

[6] Richard Lazarus was a professor at Clark from 1953 until 1957.

[7] Lazarus, Richard (1998). *The Life and Work of an Eminent Psychologist: Autobiography of Richard S. Lazarus.* p. 100.

[8] Bell is credited as the first to practice family therapy in this country. His approach to family therapy was an outgrowth of group therapy, and he treated family problems in three subsequent stages designed

not known for his work as a researcher. Because he did not conduct research, Clark students did not seek him out for their dissertations, though there were only five faculty members at the time. For these reasons, it was clear to Bell that he would not receive a promotion should he choose to remain within the department, so he accepted a more lucrative offer to pursue his career on the West Coast (R. Bibace, personal communication, November 12, 2001).

Richard Lazarus recalled his own interpersonal problem that ensued shortly after his appointment as the Director of Clinical Training. In his autobiography he writes:

> I was challenged by a man who believed I had usurped the position he should have properly have held. In his eyes, Werner had appointed me as director of clinical training behind his back.[9]

While Lazarus did not mention the name of the individual with whom he had this conflict, one might speculate that he was referring to John E. Bell.[10] Bell had been in the department before Lazarus and had been on sabbatical prior to Lazarus' promotion to director of clinical training. If this were indeed the case then it would be understandable that Bell felt unappreciated in the department and thus was pressured to leave. Lazarus goes on to write about the mystery faculty member by stating that:

> Among the faculty, I think I was more respected as a scholar than he, and it would have been a serious political mistake for Werner to have caved in to his demand. But I had no intention of ceding my role to him. I also knew Werner disliked my competitor for some reason and didn't respect him either, so I had little real anxiety about my position. The struggle was ultimately resolved in my favor, but it led to ill will and much to my regret was the only seriously troubled relationship I had while at Clark. My antagonist later left the university.[11]

Both the social and intellectual atmosphere of the time and Werner's strong experimental background contributed to the department's strong focus on producing scholars and researchers vs. clinicians. John Bell was not known for his scholarly

to promote communication and problem solving (Retrieved 6/30/02 from the Allyn & Bacon Family Therapy Therapists Profiles website: http://www.abacon.com/famtherapy/bell.html).

[9] Lazarus, Richard (1998). *The Life and Work of an Eminent Psychologist: Autobiography of Richard S. Lazarus.* p. 100.

[10] When asked directly about the identity of his "antagonist" Lazarus neither confirmed nor denied that this was in fact John E. Bell (personal communication, November 18, 2002). Even though Lazarus did not confirm our speculations about the identity of his "anatagonist" he does mention that the person he is referring to is absent from the core faculty photograph in his autobiography (1998, p. 98). The core faculty during Lazarus' years at Clark (1953–1957) included: Baker, Bell, Dembo, Gwinn, Lazarus, Wapner, and Werner. Out of these faculty only Bell is conspicuously missing from the photograph which leads us to believe that our deductions are correct.

[11] Lazarus, Richard (1998). *The Life and Work of an Eminent Psychologist: Autobiography of Richard S. Lazarus.* p. 100.

work but represented all that the department was trying to avoid: clinical practice with little basis on scientific, experimental tradition.

With the arrival of Richard Lazarus and then Mort Wiener as director of the clinical training program, Werner was able to foster the development of a clinical program more to his liking—one focused on strict empirical and experimental work. Both psychologists were known for their scientific rigor in exploring clinical phenomenon. The programmatic research on stress and emotion that Lazarus conducted during his years at Clark and beyond won him the APA's Distinguished Scientific Contribution Award in 1989 (Retrieved on 5-19-02 from http://www.psychwiz.wisc.edu/~erwin/apa.htm University of Wisconsin web page on APA Award Winners). Wiener was well regarded for his work on the psychosocial situation approach of understanding atypical patterns of individual behavior (Retrieved on 5-19-02 from http://www.clarku.edu/~psychdepartment/faculty/Wiener/shtml). Students working in clinical research under either Lazarus or Wiener were able to do work that met Werner's rigorous standards.

Heinz Werner went a long way in fortifying the developmental program by bringing in developmentalists such as Seymour Wapner, Bernie Kaplan, and Edith Kaplan. The Kaplans entered the program as graduate students and later were hired by Werner on to the faculty. Bernie Kaplan is credited with using Werner's ideas as a basis for the development of his research on symbol formation.

While many credit Werner with bringing new life to the department, there were some who felt that Werner's focus on strengthening developmental work over other areas of psychology hindered the growth of the department. Richard Lazarus described his own work during the Clark years as "quite mediocre" and in his autobiography he characterized his time at Clark as a transitional period since he had not yet found the best academic situation for himself. He remarked,

> The culture of the department centered on developmental psychology, and the faculty was too small to permit other theoretical foci to flourish. I felt I would have to remain at the periphery rather than at the center of psychology at Clark, and that wasn't acceptable to me. The department did expand after I left, and became more competitive in its salaries, but while I was there it was slow to move into the mainstream of psychology and grow with the field as a whole. I felt I would stagnate if I stayed.[12]

Therefore while Werner attempted to bring in new faculty to represent different areas of psychology, the limited budget, small department and his strong support of developmentally based research left some with the impression that Clark's department could not compete with larger and better funded departments across the country.

Many former students remember Clark as being a unique environment in which they could pursue their educational careers freely. It was an intellectual

[12] Lazarus, Richard. (1998). *The Life and Work of an Eminent Psychologist: Autobiography of Richard S. Lazarus*. p. 105.

environment characterized by the sense of warmth and respect that was fostered by Heinz Werner's gentle and respectful personality. Bob Baker described Werner as, "an Old World scholar. Deep into his work and committed to his work, to his interest in the field. And not only that but appreciative of it. Capable of some selflessness. He was a very special human being" (R. Baker, personal communication, March 29, 2002). This description seems to be the consensus of both Werner's students and colleagues. His enthusiasm for this work infused the department and created a sense of enthusiasm for his developmental viewpoints. He fostered a strong sense of community and set high expectations for his students.

HEINZ WERNER: BELIEFS, VALUES, CHARACTER

Heinz Werner was known to his students as a "benevolent presence" and a rigorous scientist (R. Baker, personal communication, March 29, 2002). Most of his colleagues had only fond memories to report. As one student described, "It's hard to convey the sweetness of the man, or the interest that he took in you" (W. Vogel, personal communication, May 3, 2002). As this remark suggests, Werner was not only a great influence intellectually, but many felt that he created a familial atmosphere—there was warmth and acceptance, though not without high expectations.

Even those who were not especially close to Werner described the department as a close-knit unit. There was a strong sense of community among faculty and graduate students alike. Because the faculty was low-paid during this era, students and their professors were equally impoverished, creating a common bond. In addition, many of the students had attended college after serving in World War II, and were therefore close in age to the young faculty. It was natural for faculty and students of a similar cohort to form social connections, and in fact several Clarkies of that era commented that the frequent parties hosted by faculty members sometimes became quite "out of hand." On the occasion of one "real drunken brawl," a student opened the front door to find Werner and his wife ready to enter. The student exclaimed, "'Heinz, Oh, my God no.' And Heinz just looked at him, caught him in the eye... and said, "'Mr. [student], obviously you mean, Heinz, oh my God, yes'" (W. Vogel, personal communication, May 3, 2002).

Werner was older than most, contributing to the respectful distance between him and the other faculty and students. William Vogel describes the relationship students had with Werner as being either "a father son relationship for which I was one. And those who had a more fraternal relationship with him" (W. Vogel, personal communication, May 3, 2002). In fact, when student Ogretta Vaughn McNeil's first husband proposed to her, her answer was, "I don't know, I have to ask Dr. Werner." Luckily, Werner said yes. McNeil's husband asked her what she would have done if Werner had said no; McNeil replied that she probably would not have married him (O.V. McNeil, personal communication, July 11, 2002).

Even though this anecdote emphasized the close, fatherly relationship Werner had with his students, it was also indicative of women's place in academia in the

1950s. As Susan Vogel explained, "there was a concern that women would marry, get involved in raising a family, and not make full use of their graduate training" (S.R. Vogel, personal communication, May 3, 2002). Upon reflection, McNeil recognized that this "concern" was probably the reason she asked for Werner's consent to marry. Susan Vogel pointed out that while there were constraints to being a woman in academia, Werner was considerably more open-minded toward the idea of women in professional and academic psychology than were many of his colleagues or contemporaries (S.R. Vogel, personal communication, July 8, 2002).

Werner's open-mindedness extended beyond his views on gender. In fact, a decade before the Civil Rights Movement in the United States, and during an era when women, let alone African American women, were not generally admitted to graduate programs, Werner and Wapner admitted Ogretta Vaughn McNeil, an African American woman. McNeil expressed her great respect for Werner and Wapner for the "courageous decision they made" in admitting her to the program (O.V. McNeil, personal communication, July 11, 2002). Apart from his open-mindedness, Werner was generally welcoming and put people at ease. At the same time, he always strongly held to his role of mentor and teacher. As such, though Werner was interested in the student's lives, he never discussed his own.

Werner's concern for students is apparent in the anecdotes many of them tell. He was remembered vividly for his frequent marches to the German Departmental Chair's office to champion psychology graduate students who had failed the required German exam. As legend has it, in one instance, exam in hand, Werner demanded, "'why do you give my students to translate this impenetrable gibberish?' And the German professor smiled evilly up at Heinz and didn't say anything and Heinz said, 'Well?' And the German said, 'Dr. Werner it's from your book' " (W. Vogel, personal communication, May 3, 2002). Overall, the students Werner worked closely with felt supported, protected and respected.

On the other hand, students who did not work either with Werner or in Kaplan or Wapner's group might have felt overlooked. This attitude reportedly was not generated by Werner himself as much as by other faculty and students. Some former students explain this as being part of the "old world" Werner represented. Students who wanted to work with him had to approach him; he would not impose on them by inviting them to work with him (W. Vogel, personal communication, May 3, 2002). Others believed that Werner simply did not take a "personal interest" in students who were clinically focused or working with non-Wernerian ideas (S.R. Vogel, May 3, 2002). Thus, while Werner was said to have a low tolerance for incompetence and was known to be direct in his criticism of students who lacked understanding of the material, if the student was someone Werner liked, he was more likely to brush off the gaff. Others, however, commented that Werner indeed had low tolerance for "stupidity" in his peers, but seemed to endure it in students without condescending to them. Instead, he was always excited to discuss ideas with students and to help them further develop their thoughts (L. Cirillo, personal communication, April 1, 2002).

Werner's expectations of students were high, but he expressed his criticism gently. One student recalls that the most critical comment he ever received from Werner on what was, in retrospect, a "dubious" piece of research was, "'I wonder if you could think about that a bit differently' " (W. Vogel, personal communication, May 3, 2002). Another graduate recalls a peer who was consistently late to class. Upon this student's tardy arrival, Werner very directly explained to the class that the reason he did not take attendance was because he assumed that they were mature enough to be depended upon (L. Cirillo, personal communication, April 1, 2002). The student was chagrined, but probably never late again. Werner did not yell, just quietly and effectively made his point.

While Werner was generally described as open to new ideas and to intellectual challenge, he did have some more rigid demands. For example, students were not allowed to have posters on their office walls because Werner believed it was unprofessional. He was also very strict in his request that students refer to him as "Dr. Werner," while only faculty (and certain advanced students) were allowed to call him "Heinz." He was also reportedly somewhat self conscious about his height. As Susan Vogel describes, "He was a little man, which is interesting because he had more stature somehow than everybody else in the department, but he was probably shorter than I am" (S.R. Vogel, personal communication, May 3, 2002).

During Arnold Miller's first meeting with Werner, this self-consciousness around height was apparent. Miller stands at around 6 feet tall, and towered above Werner's 5 foot 3 inch frame. To compensate, Miller tried to lean to one side to reduce his height. Werner turned "quite pink" when he realized what Miller was doing, and this immediately established a tense relationship between them. However, when Miller ran into trouble, Werner was his champion. During his first year in the doctoral program, Miller did poorly, largely because he was working full-time at the Worcester Youth Guidance Center as a Master's level psychologist, and was going through a divorce. He was not immersed in his studies, and the faculty unaware of the marital issue, agreed that he would have to leave the program. In spite of the tension between them, Werner agreed to let Miller stay on with the condition that he left his job at the Worcester Youth Guidance Center and that he commit himself full-time to his studies. Miller did so, and within a year had published a study with Werner and Wapner, and within two years had very successfully completed his doctorate. During this period, their relationship was transformed into a warm, mutually respectful friendship as Werner came to admire Miller's dedication to his work, and Miller opened himself up to learning from Werner. They corresponded after Miller left Clark for an assistant professorship at the University of Montana. Miller dedicated both his book *From Ritual to Repertoire* and a room in his school for autistic and developmentally impaired children to Werner (A. Miller, personal communication, April 1, 2002).

Though Werner was willing to defend students to the faculty if he thought that they warranted such consideration, he was never an authoritarian leader. He was described as genuinely egalitarian, and he ran the department accordingly. He set a tone in which everyone had the same opportunity for input and voting. Because

the faculty made decisions by building consensus, meetings could be "quite contentious and there would be issues that would be argued over with considerable vehemence." Meetings could be so heated that adjunct faculty member Tamara Dembo at one point jokingly presented Werner with a gavel with which to preside over the meetings, and graduate students often listened outside the door "for entertainment." Werner himself "was always quiet but... had a steady influence" while the rest of the faculty were "climbing up the walls." The charged atmosphere was never a problem for Werner, "as long as the decisions were argued at length and votes made, and people after the meeting resumed a civility." His presence prevented the discussions from becoming divisive, and kept the decisions productive (R. Baker, personal communication, March 29, 2002). Moreover, each of the faculty members felt supported by Werner (S. Wapner, personal communication, February 18, 2002).

Werner was similarly egalitarian intellectually and tried to foster intellectual richness in the department by hiring faculty with differing theoretical backgrounds. He never imposed his ideas on others, but enjoyed intellectual debates and believed that these debates would promote knowledge. A colleague of that era explains, "Werner was very straightforward, he wasn't out to convince anyone, this is what he had to offer, this is what he had to say" (M. Wiener, personal communication, March 25, 2002). Wapner commented that Werner was a good human being who loved others and always tried to bring the best out of them. He was an easy person to work with, sensitive to the ideas of others, but very strong in presenting his own; "Somehow you felt like you grew in many ways" (S. Wapner, personal communication, February 18, 2002). Thus, even though most of the research conducted at Clark during the 1950's was based on Werner's ideas it does not appear that Werner directly encouraged this. In spite of the social or intellectual hierarchy linked to particular research groups that some students may have felt, Werner's faculty report that they worked in an environment of mutual respect.

WERNER'S LEGACY IN CLARK'S PSYCHOLOGY DEPARTMENT

Heinz Werner's legacy in Clark's psychology department is everywhere apparent: in the little room on the fourth floor of Jonas Clark Hall where all of his books and papers are currently arranged precisely as they had been in his home library during his life, in his portraits hanging in the G. Stanley Hall room, in the history and anecdotes told about him by his colleagues, and in the department's philosophical inclination. There is continuity in much of the work that is still ongoing today. Wapner continues to apply a systems oriented approach in his more recent inquiries (Wapner & Demick, 1998, and in this volume), Bibace presents the usefulness of considering the orthogenetic principle in working with clinical populations (e.g., schizophrenics) (Bibace, Sagarin, & Dyl, 1998; Sonstroem & Bibace,

1968, and in this volume), and Kaplan continues his heated philosophical discussion of language and meaning (Kaplan, 1961; 1962, and in this volume). It is notable that so many of Werner's students chose to continue on as faculty at Clark (e.g., B. Kaplan, R. Baker, W. Vogel, and L. Cirillo, R. Bibace). William Vogel explained that students in the department "stayed around for years" because it was like "family"; there was not the great rush to get out that there seems to be at present (S.R. Vogel & W. Vogel, personal communication, May 3, 2002).

For students today, there is a strong anchor in the department to this rich past. At the same time, in some ways these strengths of continuity and history may also be the challenges to a thriving psychology department at Clark. Several of the psychologists who had studied with Werner suggested that because the department was so insular, perhaps it had not moved forward as it might have done. Additionally, the emphasis on theory rather than empiricism may have held the scholarship in a holding pattern while other psychology departments raced ahead with findings: People *believe* in Wernerian thinking, but are not largely conducting *research* in these areas (R. Baker, personal communication, March 29, 2002). Wapner suggests that professional psychology's increasing trend toward segmentation limited the visibility of Werner's holistic theories. This trend is best illustrated by the numerous divisions of the APA (S. Wapner, personal communication, February 18, 2002).

There are a few notable examples of scholars who have moved forward with research and applications based in Werner's theory. Edith Kaplan, a student of Werner's since his time at Brooklyn College, has continued to apply his theories to her research of language development and neurological assessment. She describes his paper entitled "Process and achievement: A basic problem of education and developmental psychology" (1937) as the work that has had the most profound effect on her development as a psychologist (E. Kaplan, personal communication, June 4, 2002). According to Kaplan, Werner's critical approach towards the use of standardized tests to assess cognitive functioning influenced her later work on neuropsychological assessments. Standardized tests overlook the diverse approaches people employ in their attempts at solving problems. Werner argued that the processes by which people arrive at the final solution can give us as much information, if not more, than the test scores. This idea was embraced by Edith Kaplan and applied in her work on developing neuropsychological tests. As Kaplan states, "the focus on process, a process oriented approach on assessment, has directed and dominated my professional life" (2002). This process oriented approach is evident in the items on tests which Edith Kaplan took part in developing, including the Kaplan Baycrest Neurocognitive Assessment, the MicroCog: A computerized assessment of cognitive functioning, The Clock Drawing: Neuropsychological analysis, The Boston Qualitative Scoring System (BQSS), the Wechsler Adult Intelligence Scale for Children-Third Edition Process Instrument (WISC-III PI), and the California Verbal Learning Task (CVLT). Werner's influence on modern psychological testing has not been fully acknowledged, yet his ideas are prevalent in many newly developed assessment instruments.

The work that Robert Baker called "the best exemplification of Wernerian thinking in application to a clinical empirical task" is that of Arnold Miller (R. Baker, personal communication, March 29, 2002). Miller's current work builds on a number of Werner's principles and ways of thinking. In addition to his practice as a psychotherapist, Miller is co-founder of the Language and Cognitive Development Center (LCDC) in Boston, Massachusetts. The LCDC is a day school in existence since 1965 that serves children aged 3 to 14 who have autism and other pervasive developmental disorders (LCDC pamphlet, 2002). During an interview, Miller explained,

> [Werner] was an immensely gifted man with ... broad knowledge [who] had a profound influence on some of his students. I was one of them ... my work at the center is built on a number of principles that [Werner] put forward. Not so much principles, as a way of thinking. What he taught us that stayed with us, those of us who were profoundly influenced, was the emphasis on process versus achievement. He was very upset with the behavioral strategy that argued that achievement is what counts. If you have two people with the same mental age and the two are essentially dealing with the same percept he said that provides some index but really the important thing is what is the thought process that these people have gone through to reach their outcomes to reach their functioning. That attitude has been valuable in my clinical work as well as in my research working with the special children here (A. Miller, personal communication, April 1, 2002).

At the LCDC School each child is seen as an individual who is at a certain developmental level. Therefore, the program strongly adheres to individualized teaching, and starts with helping the child learn a "system" (Miller & Eller-Miller, 2000), which can be any task appropriate to the child's level (LCDC pamphlet, 2002). This method is based on Werner's emphasis on process. The book Arnold Miller co-authored with Eileen Eller-Miller, *From Ritual to Repertoire* (1989) outlines, in detail, his approach to working with the LCDC population. A chapter in this book describes the catalytic effect of Werner's thinking on the Miller's developing a new way to understand and work with autistic children (A. Miller, personal communication, April 1, 2002).

Werner's influence can also still be felt even further afield through the work of Edward Ziegler, and Irving Sigel. Ziegler was a prominent child psychologist at Yale. He had been an intern at Worcester State hospital early in his career, and his subsequent research was greatly influenced by Wernerian psychology. He was critical that while he was doing Wernerian research outside of Clark, those at Clark were "thinking and committed to Wernerian thinking but not doing anything with it." (R. Baker, personal communication, March 29, 2002). Siegel was on the Smith College psychology faculty when Robert Baker first met him, finishing his doctoral dissertation. Siegel had attended Clark as an undergraduate, but only became aware of Heinz Werner during his graduate work at the University of Chicago. His dissertation was based on Wernerian psychology, "but there was nobody at Chicago to talk about this type of psychology." When he discovered that Robert

Baker was writing his dissertation with Werner, he asked if Baker would be willing to talk with him about Werner's ideas. Every Monday night for nearly a year, the two would meet and discuss Werner's ideas and how they applied to Sigel's findings" (R. Baker, personal communication, March 29, 2002).

Werner would undoubtedly be gratified at how these psychologists are extending his ideas and theories. What was most gratifying to him, however, is probably something much simpler:

> I [Bob Baker] came into his office one day... and Heinz was standing at the window, looking out in kind of a contemplative mood. I had an appointment, it was probably for my dissertation supervision, and he turned and he said "it's very remarkable Bob. Here I am; I have this nice office and I have exactly what I want and need to do my work. I have two secretaries out here that help me; I do just exactly what I want to do, what I enjoy doing; and they pay me. Think of that. Isn't that remarkable." (R. Baker, personal communication, March 29, 2002).

As evidenced by the comments from interviews with students and colleagues, Werner has not only left behind an intellectual legacy, but also a personal one. On the occasion of Werner's death, close friend and colleague Seymour Wapner expressed the sentiments of many when he wrote,

> His passing marks the loss of a creative scholar, characterized by great intellectual and spiritual wisdom. Those of us who knew him as a friend and colleague, the feelings of personal loss are all the more acute for also having known his warmth, his sparkle, his keen sense of humor: we are deeply grateful for having had this privilege (In Wapner & Werner, 1965, p. vii).

ACKNOWLEDGMENTS

We would like to thank the people who generously shared their time and their thoughts about Heinz Werner with us: Robert Baker, Roger Bibace, Leonard Cirillo, Bernard Kaplan, Edith Kaplan, Ogretta Vaughn McNeil, Arnold Miller, Susan Raymond Vogel, William Vogel, Seymour Wapner, and Morton Wiener. Richard Lazarus graciously responded to our inquiries eight days before passing away.

REFERENCES

Bibace, R., Sagarin, Dyl, J. (1998). The heuristic value of Werner's co-existence concept of development. *Journal of Applied Developmental Psychology, 19(1),* 153–163.

Cohen, P.C. (1982). *A Calculating people: The spread of numeracy in early America.* Chicago, IL: University of Chicago press.

Franklin, M. (1990). Reshaping psychology at Clark: The Werner era. *Journal of the history of the behavioral sciences,* 26, 176–189.

Iritani, T. (1965). Professor Heinz Werner: Recollections of the man and his contribution to psychology. *Psychologia: An international journal of psychology in the orient, 8, 1–2, 111–119.*

Jefferson, H.B. (ca 1972). My first impression of Clark University. Unpublished document. Box 5, Series III, 1946–1972. Howard B. Jefferson papers, Worcester, MA, Clark University Archives.

Kaplan, B. (1962). Radical metaphor, aesthetic, and the origin of language. *Review of Existential Psychology & Psychiatry, 2(1),* 75–84.

Kaplan, B. (1961). An approach to the problems of symbolic representation: Nonverbal and verbal. *Journal of Communication, 11,* 52–62.

Koelsch, W.A. (1987). *Clark University 1887–1987: A narrative history.* Clark University Press.

Lazarus, Richard (1998). *The Life and Work of an Eminent Psychologist. Autobiography of Richard Lazarus.* Springer Publishing Company, Inc.

Miller, A. & Eller-Miller, E. (1989). *From ritual to repertoire: A cognitive-developmental systems approach with behavior-disordered children.* New York: John Wiley and Sons.

Miller, A. & Eller-Miller, E. (2000). The Miller Method: A Cognitive-Developmental Systems Approach for Children with Body Organization, Social and Communication Issues. In S. Greenspan, S & S. Weider, Eds.), *ICDL Clinical Practices Guidelines: Revising the standards of practice for infants, toddlers and children with developmental challenges (pp. 489–516).*

O'Neill, W.L. (1986). *American high: The years of confidence, 1945–1960.* New York: Macmillan.

Lima, S. de (1999). Between Scylla and Charybdis: Tamara Dembo and Rehabilitation Psychology. *From Past to Future: Clark Papers on the History of Psychology, 2(1),* 19–42.

Sonstroem, A. M. & Bibace, R. (1968). The application of a capacity treatment model for achieving differentiation in a schizophrenic girl. *Journal of Nervous & Mental Disease, 147(4),* 354–370.

Valsiner, J. and Van der Veer, R. (2000). *The Social Mind: Construction of the idea,* Cambridge: Cambridge University Press.

Wapner, S. & Demick, J. (1998). Developmental analysis: A holistic, developmental, system-oriented perspective. In R.M. Lerner (Ed.), *Theoretical models of human development, Vol. 4. Handbook of child psychology* (5th ed., Editor-in-chief: W. Damon). New York: Wiley.

Wapner, S. & Kaplan, B. (1966). *Heinz Werner 1890–1964: Papers in memoriam.* Clark University Press.

Wapner, S. & Werner, H. (Eds.) (1965). Body Percept. New York: Random House.

Werner, H. (1957). Comparative psychology of mental development. New York: International Universities Press, Inc.

Witkin, H.A. (1965). Heinz Werner: 1890–1965. *Child Development, 30, 2. 307–328.*

8

HEINZ WERNER: MENTOR AND MENSCH

Thomas B. Mulholland

After graduating from Tufts College in 1951 with a year left on the GI Bill, I applied to Clark for the Experimental Psychology track. I arrived for my interview complete with pork-pie hat, white shoes and grey flannel trousers. Heinz and, I believe, Si Wapner interviewed me. Heinz was very interested in my attitude toward experimental work, my scientific training and laboratory experience. He also asked if I had attended any of the lectures of the then President of Tufts, Leonard Carmichael, whose early experiment on the maturation of swimming behavior of salamanders was well known to him. As the interview progressed, I realized that I was talking to an exceptional, deeply scholarly professor unlike any I had met in undergraduate school. At the same time, I noticed that Heinz Werner was quite short and had a very large head, not at all resembling my mental picture of him. I remember thinking that in that head was an excellent mind. I was thirsting for knowledge and here I was at a fountain of knowledge! When I left, hoping that I would be admitted, I felt that I, an obvious tyro, had been kindly treated. That was a feeling that was repeated many times during my studies at Clark.

The majority of students in that period were pursuing a specialization in developmental psychology especially cognitive development, e.g., the development of language and, in clinical psychology. Fewer students were specializing in experimental psychology.

The technology and electronic hardware familiar in other experimental psychology laboratories such as oscilloscopes, amplifiers, etc., were not to be found at Clark Psychology. Rather the emphasis was on ideas and on the requirement of asking meaningful questions before doing an experiment. Stand-alone empirical

data without connection to a wider theoretical development was not valued as much as experiments integrated in a theoretical system.

Heinz seemed to have the belief that that students who grew up in small-town New England were skilled with tools compared with students who grew up in large cities. Students working on their thesis in-house were allowed to build our own equipment. One of the large constructions was a minor feat of electrical engineering which, when a switch was opened, blew up the switch box on the wall rather dramatically. However, such exciting events were infrequent.

Heinz, who was so well known for his pioneering contributions to developmental psychology, also had a rich knowledge of the experimental psychology of perception and of the history of ideas, theories and experiments that were most important in experimental psychology and Gestalt psychology. Of course, he was very knowledgeable of the intellectual currents and artistic developments extant in Germany when he was professor in Hamburg. Along with the other students, I received the benefit of his knowledge that enriched his lectures and his conversations with us. Even though my own specialization was quite different from developmental psychology, Heinz shaped and enlarged a view of scientific work as a process of obtaining valid knowledge whose value was inherent in its originality and relevance to theory rather than in its practical application. In retrospect, this was rather out of step with American pragmatism of that time. Yet it was a viewpoint which to me was the gift of a genuine scholar and which I carried with me in my own career.

Once I mentioned to Heinz and to Si that in my rented room I was doing some experiments following up on the work of Aldelbert Ames, whose "Ames' effect" was included in the elementary Psychology textbooks of that time. They were quite interested so I brought to them my old- fashioned kind of lab book which contained a record of my experiments. Both were very supportive and gave me permission to set up an experiment in a room in the department. What a thrill! My own lab! It was another one of the many supportive kindnesses I received from Heinz and Sy. Some of the experiments were published while I was still a student thanks to their willingness to allow a lot of freedom.

That tolerance of independence was affirmed many times. For example, I had read a paper by some American psychologists on "micromelodies" which was presented as original research even though Heinz had published experiments on the same topic many years before, work which the authors did not cite. Without getting permission, I fired off a somewhat warm letter to "put them straight". Some days later Heinz received by mail a heartfelt apology about their wholly unintentional omission and they affirmed that my letter was justified. So Heinz called me into his office. I believe Si was there too.

On the way in the departmental secretary told me "it's something about a letter" so I was really scared. To my relief, I was reprimanded calmly and advised to get permission before I took on the role of defender of the priority of Heinz's published experimental results. Many years later, Beverly and I had the pleasure of dining with that now-famous psychologist and his wife at a conference in Czechoslovakia.

Soon after I came to the Department, I became interested in a great pile of discarded old books and pictures in a small room near the Psychology office. There were works by many famous psychologists from an earlier era and photographs of the participants at the now-famous Clark conference on psychoanalysis that included Sigmund Freud, Jung, Adler, William James and other luminaries. I started rescuing the collection and one day, the Friday after Thanksgiving, I was on my knees lifting a pile of books and uttered a loud groan. As I turned, still on my knees, I saw Heinz looking down at me and smiling "*Vell Tom, did you tank Gott till you were green in the face*". I realized that Heinz had a sense of humor, that he was bemused by the unfamiliar holiday, and that he was amused my unilateral effort to conserve the old books and photographs.

When a bust of Sigmund Freud was presented to the University some years later the question arose "where to put it". Heinz decided it should not be placed in the Department's space but adjacent to it on the staircase. As I remember, his comment was that Freud was not *in* Psychology but *near* Psychology.

Another time, Heinz overheard me talking to the secretaries and he called to me from his adjacent office. As I entered his back was toward me and, as his desk chair turned (his feet barely reaching the floor), he was wearing an eyeglass frame in which were two refracting prisms. On the facets of the prisms were two enlarged images of his eyeballs which seemed to be standing out from his face and which moved as he manually rotated the prisms. He talked to me about my experiments as if nothing was unusual all the while keeping the prisms in place and looking at me with large, moving eyeballs. It was hard not to break into laughter. I later thought that Heinz knew a lot about those old-fashioned prisms which came from the "brass instrument" collection displayed in the hall outside his office. He must have known about the reflection of his eyes and now I think he was having some fun.

Early on I became interested in parapsychology and visited Professor Rhine's laboratory at Duke University to find out more about his experimental procedures and data collection. He told me that there was a fund at Clark for the study of parapsychology but that if I wanted to get a degree in psychology I had better not inquire about it. On my return, as we walked down the hall toward the Department office, Heinz asked, in a friendly way, why I had been away from the Department. I told him of my visit and inquired about the fund. As I belabored him with my interest in parapsychology he was silent. Suddenly, he turned into the main lecture hall. I followed and brashly continued my inquiry. Heinz stopped, banged his fist down on a table and said "***Tom, you can't prove God with a statistic***". He was right and I recognized that he understood the real basis for my interest. Yet, he was tolerant of my naïve enthusiasm.

Though quite tolerant of my foibles, there was one trait which he would not accept—lazy thinking. And he would let me know it. During one of his lectures I confidently made a comment which however, revealed a lack of sufficient analysis, a lack which resulted from "lazy thinking". Heinz rejected my comment noting that I was guilty of "elliptical" thinking. Later on I found out that he meant something

quite different from "circular" reasoning . After that put-down I tried to avoid any lazy thinking—it was a good lesson.

I often felt that the informality of Clark students in their social relations with professors put him off. For a student to give a greeting or ask a question spontaneously without invitation in a public place not a comfortable encounter for him. Years later when I lectured in Germany I observed that the dignity and authority of the older professors was supported by a more formal behavior of students than I had observed while attending Clark. Once he inquired about my early education—who taught me; how were classes scheduled and who were my teachers. When I told him that I was taught by nuns in a small parochial school for twelve years he exclaimed "My God, how did you stand it"

Once Heinz had to speak to a group of parents of school children to support a developmental research program which would involved their children. He tried to explain the program in a way that would be at their level of understanding. It was difficult for him to do so. I had never heard him oversimplify the complexity of a topic in lectures or in conversation. His talk was brief and, as he hurried away, I felt that it was not comfortable for him to juxtapose scholarship with a layman's understanding. Heinz had an apple a day and said that it was the reason for his longevity. He also remarked that "a chimpanzee could learn to drive a car" but he rarely if ever drove.

Though he had misgivings about our decision to marry while I was pursuing an advanced degree, he was always very welcoming to Beverly and I when we visited him to show him our new son. He seemed to enjoy seeing us as a family and rather intently observed our son as he toddled about and commented on various aspects of his development. Heinz was very considerate of Beverly and at parties where she did not know the students and faculty he sought her out and spent time conversing with her. More than anyone else he understood how difficult it was to be married with two children to a student who had only a tiny income and little time for family life. Beverly recognized his kindness and still remembers it with appreciation. We named one of our sons with the middle name "Werner". He subsequently went to Clark and by then had understood the significance of Heinz in our lives.

Heinz had an artful ability to imagine how a child would experience his or her world. Once he told Beverly that to be a proper developmental psychologist, one had to "*experience the world with the mind of a child*" I believe that this ability enabled him to construct theoretical abstractions about processes of development which could be successfully applied to the classification of specific empirical observations made on a single child. This gave face-validity to the procedure of competently observing and classifying a level of maturation of a child's behavior and language in a "natural" setting.

Over the years at Clark I got an inkling of what a painful disruption in Heinz's life and career was his departure from Germany. During my time as a student I was a member of the Naval Reserve and one time, before leaving for a Naval research conference I stopped by the Department in uniform to say goodbye. Heinz was nowhere to be found. Later Si told me that Heinz really disliked military

uniforms and suggested that I not wear it when I came to the department. I realized that the uniform stirred painful feelings which could not be easily overcome and found no reason to wear the uniform at Clark again. Some months later while we were walking outside I asked him what it was like to leave Germany and come to America. He accepted my rather direct question without evident annoyance, turned and looked directly at me but said nothing. Finally, he said that it was difficult. That was all. As we continued walking, not talking as much as before, I recognized then, as I do now, that he had a great inner strength to endure such a profound interruption of a successful academic career at Hamburg University and still continue his life-work as a University professor and scholar in a foreign country.

When I passed the qualifying exams for candidacy Heinz insisted that my knowledge of personality theory and abnormal psychology was incomplete and that I should do post-doctoral work in that field to be better equipped for a professional career. He also advised me that whatever position in research I chose, *I should stay in one place because it was very difficult to be a successful itinerant researcher.* As it turned out, these were uncannily predictive and helpful recommendations in a far-future.time. A few weeks before his death, too weak to write, Heinz dictated a note (which Erica wrote) still offering encouragement and wishes for a good life for me and our family. I feel that I was so very fortunate to have known Professor Heinz Werner, to have learned from him, and to have shared a small part of his life.

9

WERNER: ORTHOGENESIS AS LIFE STYLE

Irving Hurwitz

In considering what influence the Wernerian concepts of development had on my ideas about myself and my family I think I must begin with what I felt was one of the most intriguing ideas in the whole array of Werner's principles and percepts. Specifically, this is the notion that development was not synonymous with chronology and the related idea that we can operate at different levels of maturity at different times and under different conditions, both internal and external. This is to say that different states of mind, for example fatigue or heightened emotionality, could lead to divergent ways of looking at reality, and indeed, justified the relaxation, if you will, of those most stringent demands for objectivity that I often feel essential and highly valued. I could then, using the wisdom of Werner's formulation, understand why I enjoyed listening to all sorts of music, from jazz to opera as a purely enveloping, even "global", experience, without the necessity of resorting to some intellectual plane of appreciation, yet knowing at the same time that I could return to that level of conceptual sensitivity at any time. This may not sound like much, but in retrospect I found it a liberating kind of insight inasmuch as the notion of multiple levels of organization within myself broadened the gamut of aesthetic experiences to which I could respond with a newly found excitement.

MICROGENESIS AS A PSYCHOTHERAPEUTIC TOOL

The separation of development from chronology was of major significance in helping me to understand the material produced by the children I worked with in

my clinical endeavours. I began to be able to gauge the degree of progress being made in the nature of fantasy material, drawings, and other communications that took place in the therapy sessions. It was not simply a matter of increased coherence that took place, though this was a consequence, but that what emerged was more organized, cause and effect became more crystallized in terms of central themes and subordinate ideas. Often even individual sessions could be reconstructed as examples of microgenetic change wherein initial discomfort provoked regressive forms in the nature of communication. Yet, as anxiety lessened, it was possible to see the emergence of more organized and meaningful communication. This whole concept of microgenesis in therapeutic work made the whole process of supervision for me more effective. By paying attention to the structural features of the process I could sharpen the significance of the content as I reviewed this with various mentors who helped me in my work. I actually felt that understanding these effects gave me something of an advantage over my colleagues, both when I was an intern and subsequently in my later work as a staff member. I recall an instance that happened when I was in the Army, stationed in Washington, D.C. Dr. Roy Schafer, a fellow Clark University Ph.D., was offering a seminar on the Rorschach at the nearby hospital and we were permitted to attend. He clearly espoused a Wernerian perspective in his discussions, along with the expectable emphasis on psychoanalysis which was his forte, and when we returned to our base I found myself cast in the role of interpreter to my colleagues as to precisely what these formal principles in scoring and interpretation were all about. It was a nice moment for hubris in an otherwise bland experience. There was an air of "discipleship" that followed from exposure to Werner's approach to development. I mean by that that I always felt I was proselytizing the vast numbers of the uninformed that I would come into contact with, urgently trying to get them to see the light about the true way in which to think about development, to get away from nitpicking ideas of timetables for this or that emergent skill such as walking or toileting, and see the fascinating significance of physiognomic language, or the child's syncresis in drawing and description, to understand the mapmaking skills of the Eskimo fisherman, and why eidetic imagery disappeared from the child's life as conceptual thinking took over. I always had the feeling that those of us who were fortunate enough to have studied with Dr. Werner constituted the core of the enlightened with a mission to perform. That may seem more than a little hyperbolic, but I have to confess it was, and at times still is, a sense I have about the whole experience. I believe that one of the memorial meetings was devoted to applying Werner's ideas to architecture, literature, art, and medicine.

ORIGINS

I recall my forst class with Dr. Werner in the Fall of 1948, my first year in graduate school and, if I am correct, his first year at Clark University. It was Psychology

209, the general introduction to his developmental theory. My fellow students where wholly unknown to me and I was in fact more than a little intimidated by them as they all seemed far more sophisticated and knowledgeable regarding psychology than certainly I was, having come from a different academic major. I was even more surprised to learn that several of those in class had actually come to Clark from Brooklyn College and were familiar with his approach. I waited with considerable uneasiness until class began when in walked this rotund, rubicund, elfin figure, cigarette dangling from his lips, and speaking in a soft Viennese accent. It wasn't long before my trepidation gave way to fascinated interest in what he had to say. Any doubts I had about the wisdom of my decision tom pursue graduate work in psychology as my chosen course soon dissipated.

As the year progressed, I came to know Dr. Werner[1] on a more personal basis. On several occasions during that early period, when he became aware that I had a background in biology, we discussed the ways in which that discipline "crossed over" into considerations that were relevant to psychological developmental principles. I specifically recall exploring with him the significance of analogous processes in biological contexts, something he had discussed in class and in his text which I found a very clarifying notion. Even though he attributed its origins to biologists, I had never come across the term in my undergraduate courses. I always felt, in my interactions with Dr. Werner, a gentle demeanor, though I have seen instances when he showed a distinct intolerance for what he felt were lapses of intelligence or good sense.

I remember a class in which he asked us to represent, visually, an aphorism—namely,

"EMOTION CLOUDS REASON"

I thought I was being very clever when I drew the following

Dr. Werner took one look at it and snorted his displeasure, describing my effort as primitive, and even childish, saying in fact that it was precisely the opposite of what he had in mind. I soon understood my lapse into concreteness.

At the same time, if something met with his approval, he was open in his praise. I had designed a version of the Müller-Lyer illusion to illustrate an aspect

[1] I always referred to and addressed him as Dr. Werner, never by Heinz

of the sensory-tonic fields theory of perception which both he and Dr. Wapner thought worthwhile. Dr. Werner invited me into his office and, based on this effort, he suggested that perhaps I would do better to switch my emphasis from clinical psychology to experimental psychology. I felt that coming from him, this was about the highest accolade I could receive, though I did not follow through on his suggestion and remained in the clinical track.

TRIPPING THE LIGHT FANTASTIC

One event took place in the Spring of 1950, the consequences if which purportedly shed light on Dr. Werner's attitude toward the lifestyle of graduate students in the department. There had been stories told, veryt like apocryphal, about Dr. Werrner's personal life, particularly stressing his frugality and his devotion to scholarly life, at the expense of more worldly indulgences. But the event I am about to describe seemed, at least in the short run to lend a degree of credibility to these alleged accounts of his views.

A small group of graduate students including myself met and decided it would be a good idea if we spent a night out with wives and dates at what was considered then a very "classy" night club. The rationale was to seek a breather from the rigors of graduate study and enjoy an evening of dining and dancing. The event was a success and as near as I can recall, a good time was had by all who attended. However, during the days subsequent to this outing, those who had participated began to hear reports that Dr. Werner had learned of this activity and was clearly critical of these students' behavior. It was said that he disapproved of what he considered such profligacy on the part of the students who were always seeking financial assistance, yet were willing to splurge on such frivolous displays. Though those of us who participated were thoroughly chastened by these alleged criticisms from our department head, we still felt this had not detracted from the pleasure of that night out. My own feeling about this whole episode is that Dr. Werner had not ever expressed displeasure at what had taken place, even assuming that he was aware that it had happened, and that the reports of his adverse remarks were actually manufactured, innocently of course, by those not able to join the reveling group. In fact, over these years I was convinced that Dr. Werner would not only have approved of our plan, but very likely sought an invitation. The social gatherings at his home at various times of the year were always characterized by lightheartedness and relaxed sharing of enjoyment and pleasure. There was never an atmosphere of somber intellectualism at these times, and it seemed to me that he was always the first to encourage us to "let our hair down." Thus, over the years, I have discounted the stories told by those who portrayed him as a martinet committed only to having his graduate students existing as scholarly drudges. Nevertheless, there seemed to be a necessary perception of him on the part of most students, as a hard taskmaster, whom insisted

on unswerving devotion to serious scholarship, despite plenty of evidence to the contrary.

PLANET OF THE APE

An interesting event took place during the celebration marking the 50th anniversary of Sigmund Freud's visit to Clark University (1909). These observances took place concurrently with the meetings of the Eastern Psychological Association that were held in Worcester, and involved presentation of papers, panels, and symposia by psychologists from all over the eastern seaboard as well as from other parts of the United States. Among those attending were Dr. and Mrs. Hayes from Florida, bringing with them their two year old chimpanzee, Vicki, who had been raised in their household, using the same child rearing methods as with their son, and who–it was reported—had mastered the ability to produce intelligible language. Naturally, as one of the major contributors to research on the development of language, Dr. Werner was interested in this presentation and arranged a special meeting on the last day of the convention. It took place in Jonas Clark room 105—one of the large classrooms. A number of students and faculty assembled along with several guests which included Dr. Kurt Goldstein and others. The animal was dressed in the typical garb of a toddler and seemed at ease until Dr. Hayes attempted to get her to speak at which time she became quite unruly, leaped about the room and landed perilously close to both Dr. Werner and Dr. Goldstein, who seemed quite taken aback. The point of this story is the gracious way in which Dr. Werner reacted to what could be arguably refereed to as a fiasco. Certainly I was impressed by the manner in which he thanked the Hayes for their attendance and their presentation, despite its less satisfactory result, and in conversation with a number of students the following week he explained why, in his view, such so-called natural experiments with primates would prove fruitless, based on his developmental approach to how symbols were created.

CODA

Finally, I would say that my years at Clark University in graduate school were certainly among the happiest. Dr. Werner's influence created an atmosphere of intellectual excitement that I had not experienced during my undergraduate period. He certainly opened my eyes and ears to ideas and concepts I had not known before. Despite his comments about "escaping from psychoanalysis" while in Vienna, he clearly was not permitted to escape psychoanalysus' co-opting him. One has only to examine the frequent references to him by Shafer in his ***Diagnostic Psychological Testing***, or David Rapaport's monumental ***Organization of pathological thought*** (in which there are 35 references to Werner) to realize the degree to

which psychoanalytic theorists and practitioners turned to Dr. Werner's approach to development to clarify their own thinking. As students we were able to experience first hand these theoretical syntheses since Dr. Rapaport and Dr. Shafer were at Clark, offering graduate courses at Dr. Werner's invitation. And not the least consequence of my graduate years were the lasting friendships I made with such luminaries as Roger Bibace, Bob Baker, Bernard and Edith Kaplan, Dr. Wapner, and, of course it was here that I met my wife.

10

HEINZ WERNER, MY SPIRITUAL GRANDFATHER

A LITTLE GIANT WITH TRANSPARENT BLINDERS

Sandor Brent

Throughout my life I have been blessed by a number of y great teachers: Walter Goedecke, Ernst Abrahamson and Viktor Hamburger at Washington University in St. Louis and Bill Hayes and Clyde Coombs at the University of Michigan in Ann Arbor, to name only a few. These were teachers from whom I learned not only a body of knowledge about the subject they were teaching, but a special way of being in the world—not only as a scientist, scholar and teacher but, most importantly, as a human being. However, my two most important teachers have been the Nanrei S. Kobori and Heinz Werner.

The Rev. Nanrei Kobori was the Chief Abbot of Ryoko-in, a sub-temple of the great Daitoku-ji Temple-complex in northwest Kyoto, under whom I studied during my 1969–70 sabbatical leave. Heinz Werner was chairman of the Psychology Department during my 1958–62 tenure as a graduate student at Clark University. I have often described Rev. Kobori as my spiritual elder brother and Prof. Werner as my spiritual grandfather, since they were respectively about 14 and 40 years older than I when I studied with them.

While each was a world renown celebrity in his own domain both shared in common an absolute sense of their own personal transience and insignificance in the greater scheme of things. And yet, perhaps because of this larger view of their own place in the world, each was a mench, with a fine, playful sense of humor. At the end of a busy day at the Temple Kobori would often sit in front of the family TV set with his wife and adopted children and watch the Japanese equivalent of Milton Berle or Sid Caesar. One of Werner's favorite TV programs was Art Linkletter's

"Children Say the Funniest Things." I loved both of these men very dearly. I think they both would have greatly enjoyed each other's company.

Each, I believe, was a priest in his own domain. I always saw Werner as a "priest of science," a man who, for a brief time, was given the gift of being able to bathe in and to immerse himself in the river of the history of science but who nevertheless knew with certainty that ultimately, in the greater scheme of things, his contribution would be no more, nor less, significant that the sweat which washed off his body while into that stream. Kobori once said, "Life is really very simple: When you come in you say, 'Hello'; when you leave you say, 'Good-bye'."

But this memoire is mainly about my recollections of Prof. Werner during my four years as a graduate student at Clark. I think of those as "Golden Years", for they were a magical time for those of us who lived and worked there at the time—years when we truly saw ourselves as and acted as a community of scholar. There were of course "senior scholars," our professors, mentors, and teachers—Bernie Kaplan, Sy Wapner, Bob Baker, Mort Weiner, Roger Bibace, Hob Crocket, and others—and junior scholars—we the students. Because the Department and the University were so small and compact, and because there was not all that much to do in Worcester at the time, we really did constitute a closely knit "community of scholars", a community whose members spent most of every day and a good part of most nights together—talking, schmoozing, studying, arguing, playing and laughing. We sometimes referred to ourselves as "Heinz's family".

That sense of being a community of scholars was to a large extent created, fostered and maintained by that unique gestalt triumvirate of Heinz Werner, Bernie Kaplan and Sy Wapner, with Professor Werner as the keystone and Professors Kaplan and Wapner the pediments. It was rumored that Professor Werner once referred to Professor Wapner as his right arm, and Professor Kaplan as his left hemisphere.

In the remainder of this memoire I relate a series of incidents which, taken individually, were of no great significance, yet taken collectively, like the dots on a pointillist's painting, create a picture of great intellectual and spiritual beauty. It was only years later, when I was exposed to the Tao of Japanese Zen Buddhism, that I grasped the spiritually close relationship between the teachings of Heinz Werner and those of the Zen Buddhists as they were present to me by Rev. Kobori.

LOVE AT FIRST SIGHT

In June of 1958 I completed the 18 hours of post-BA undergraduate psychology credits I needed for admission to graduate school. At that time I was interested in becoming a child psychotherapist. At the suggestion of Professor Bill McKeachie, who was then supervising undergraduate advising in the Psychology Department at the University of Michigan, I had applied to only two graduate programs: Michigan and Clark. Since I was admitted to both I again consulted with McKeachie for guidance in deciding between the two. His advice was straightforward: Next year, he said, Michigan would be admitting about 150 new psychology graduate students,

Clark about 7. Michigan had about 50 full-time teaching faculty, Clark about 10. "Which would you prefer?", he asked.

Up to that point, I had attended only large universities so a small intimate setting with close personal student-faculty relationships seemed as though it would be a refreshing change. However, since I knew little about Clark and nothing about Worcester I decided to drive East and check them out before making a decision.

I arrived in Worcester on a bright sunny Sunday afternoon in August, checked in to the downtown Y, and then drove to Clark's campus. Looking at the Clark campus today it is difficult to imagine what a small, sweet, quaintly pristine, New England college it was in those days. A welcome relief after four years at the elaborate campuses of Washington University and two years at the University of Michigan, and briefer stints at Columbia, NYU and Berkeley.

My appointment with Dr. Werner was the next morning, Monday. Jonas Clark Hall was then, as now, a red-brick post-Civil War Victorian office-factory building: oak paneled walls, 30 foot ceilings on the first floor, and a double-curved wooden semi-circular staircase going up three stories, with a large landing between each story. Very beautiful and elegant, I thought.

The hallway of the third floor, home of the Psychology Department, was lined with oak display cases containing a wide variety of 19th century brass instruments which have, I am told, since been donated to the Smithsonian.

After introducing myself to Dr. Werner's secretary I was shown into the G. Stanley Hall 1890s oak-paneled chairman's office that reek of history. I was seated at one end of an oak conference table. Dr. Werner came in and sat at the other end. I remember nothing of our conversation. However, I do remember two things about Dr. Werner. The first was that he was so short than when he sat down his feet did not touch the floor. The other was his bright, shining, whimsical, intelligent eyes. For me it was love at first sight: I wanted to be near this man, study with him, play with him, know what he knew. By this time I had already studied extensively with Viktor Hamburger and Clyde Coombs, among others, so I was no naive innocent when I came to studying with "great men." But here, I knew, was someone really special. In the 42 years since that first meeting, I've never had any reason to doubt that initial judgement.

AS I later learned, his short physical stature had played an decisive role in his becoming a psychologist. As a new freshman at the University of Vienna, as he told it specifically interested in studying with a very famous scholar of Medieval music. Thus his first day at the University he entered a very large lecture hall and went to the front row to be sure of being able to take in everything this great professor had to say. Much to his dismay, when the lecturer entered the he realized that he had come into the wrong lecture hall. He knew what this professor he came to study with looked like from his picture which appeared frequently in the Vienna newspapers. This was clearly a different man.

Nevertheless, as he told it, because he was so short he was embarrassed to get up an leave and so sat through that entire first lecture which was on the history of psychology. He was so fascinated that he never left and by the end of that year had written several papers on psychology.

However, his decision focus his academic studies on psychology did not detract from his continuing interest in music—and poetry—as well. Thus, his earliest developmental research was on how young children learn to reproduce simple melodies; and two of his earliest books are entitled *The Origin of Metaphor* and *The Origin of Lyric*. Indeed, as a student, I was often struck by the fact that, while the classical Gestalt psychologist—Köhler and Koffka—most often used the cutting-edge physics of their day as their frame of reference, Werner conceptual thinking was more often organized in terms of musical and other artistic structures.

EXPERIMENTAL PSYCHOLOGY AS A MOZART DIVERTIMENTO

Our entering class at Clark had five members: Lenny Cirillo, Bernie Kempler, Paul Rozenkrantz, Bob Dowling and myself. The first class we had with Dr. Werner was his Experimental Psychology which was, in fact, both a methodological and a philosophical history of experimental psychology.

We all sat around a long rectangular conference table. Werner sat at one end with the blackboard behind him. I sat on his right. Since I had long ago learned to take lecture notes without looking down I could pay full attention to what was being said and drawn on the board. At first it all seemed very simple and straightforward. However, as the weeks went bye and I began reviewing my notes I gradually realized that I was witnessing something truly amazing. This series of lectures on the history of experimental psychology that was unfolding before us like a Mozart divertimento. Each lecture in Werner's experimental course, like each passage in Mozart's divertimento, was simple, elegant and lovely, but was in itself of no great significance. However, as the structure of the total composition unfolded over time I came to realize that I was witnessing, being given, being exposed to a spectacular, transcendent, integrated view—not just of the history of psychology, or of psychology in general, but the way the world as a whole is put together. Of course this was never mentioned or alluded to. For it was not the content of the course, per se, but Werner's way of organizing and thinking about the history of experimental psychology that, like Mozart's way of thinking and organizing the divertimento, that presented to the careful listener a new a different way of looking, hearing, perceiving, thinking about the world. I was truly in awe. It was only later that I learned of Werner's early experimental work on the psychology of music.

Nowhere was Werner's special way of viewing the world more clearly revealed than in the following incident.

LIKE A HORSE WITH TRANSPARENT BLINDER

During the years I was at Clark we had a colloquium speaker most Wednesday afternoons during the regular school year. Because Clark had such an illustrious

place in the history of psychology, and because Werner was so well-respected in the psychology community worldwide, many famous psychologists came to address us despite our small size.

These colloquia were held in the old oak-paneled 19th century lecture room which connected directly to the G. Stanley Hall chairman's office so that the chair could enter directly from and return directly to his office. The room was about 40 × 40 feet with a 20 or 25 foot ceiling. The lower part of the back wall, up to about shoulder height, as line with built-in oak bookcases containing complete sets of many historically famous psychology journals, such as ***L'Annee Psychologique***, and ***Psychologiche Forshung***. Above the bookcases and going up another four or five feet were rows of simply framed 8 × 10 black and white photos, in chronological order, of every doctoral student who had received a doctoral degree from Clark since the Psychology Department's founding in 1894. Many were, and are, world famous contributors to the history of psychology. That wall, like the G. Stanley Hall chair's office and the brass instruments on display in the hallway, reeked of history—ancient psychology history. To new graduate students, and probably to most colloquium speakers, it was all very impressive.

In front of this wall were several large oaken conference tables arranged in a U. The speaker, standing at the podium in the opening of the U, spoke facing this wall of bookcases and photos. Werner always sat at the front of the right arm of the U on the speaker's left, a cigarette dangling from his lips, his eye-lids lowered., so that we sometimes wondered if he were sleeping through the lecture. However, as soon as he spoke it was clear that he was merely listening intently.

When the speaker was done the graduate student who was chair of the colloquium committee would thank the speaker and invite questions from the audience—usually the dozen or so first and second year resident graduate students who were required to attend, some of the more advanced students, and a handful of faculty. After all of us had made clever comments and asked our probing questions the colloquium chair would turn to Dr. Werner and ask if he had any questions or comments.

Oftentimes, of course, he would. His remarks were always spoken softly, quietly, deliberately and, most often, penetrated tot he very heart of the matter—questioning or commenting on the deepest, most fundamental, underlying assumptions of the general theory, specific hypothesis, or basic methodology of the work being presented. While graduate students and faculty could sometimes be confrontational or even hostile to colloquium speakers whose underlying point of view was in conflict with the Wernerian point of view, I can never remember Werner's remarks as being anything but integrating: intended to draw the speaker out on what he or she did and why, and help the rest of us better understand what had actually been done and what its significance was—even of positions that were antithetical to the Clark's Wernerian point of view.

Indeed, no matter how much Werner may have disagreed with what the speaker had said or done, he always addressed the person of the speaker and the underlying intent of the speaker with the utmost respect. At the beginning of Werner's questions or comments to the speaker I would often hear an unspoken

sub-text, which went something like, "You are a very nice young man and this was a very interesting study but..." Since Werner was, at this time, in his early 70s, most of the colloquium speakers, even those who were well established celebrities in our field, were 10, 15 or 20 years younger than he.

Nowhere was this attitude toward opposing points of view more clearly illustrated than after a colloquium given by Ogden Linsley, who was then well-known for his controversial experimental work on the Skinnerian reshaping of the aberrant behavior of certain imprisoned criminals and hospitalized mental patients. At the end of his talk, which was quite antithetical to the Clark point of view, Werner asked some really penetrating questions which showed a deep understand of the assumptions and goals of the Skinnerian point of view.

In those days, immediately after each colloquium, we would all adjourn to a cocktail party held in the livingroom of a small University owned house not far from the main campus. It was a very relaxed atmosphere, helped by a little liquor, in which the guest speaker, faculty and students could interact in a very informal manner.

On this occasion I was standing schmoozing with Dr. Werner and Hal Kelner, a first year grad students who had, in his younger days been trained first as a Talmudist in a Boston Yeshiva and then, during his undergraduate years at Boston University, as a Skinnerian. After we had had a couple of drinks, Hal turned to Werner and asked, very respectfully, but in a very puzzled voice, "Dr. Werner, since you are so adamantly opposed to the Skinnerian point of view, how come you know so much about it?" (In those days Hal often played Carlos Castaneda to Werner's Don Juan!) I can still picture Werner standing there, no taller than my shoulder, looking up at us and smiling whimsically. "When you are working intently on something," he said, "you have to wear blinders like a horse [holds his hands up to both sides of his eyes like blinders], but those blinders have to be transparent, or you will be living in a deluded world."

The idea of "transparent blinders" floored me. I loved it. And I loved the twinkle in his eyes as he said this. It was only years later that I came to understand that such paradoxes are at the heart of the Zen koan—the paradoxical situations which Zen masters given their students in order to help them transcend and integrate at a new level concepts which appear to be paradoxical to ordinary every day perception. No Zen master could have come up with a better, clearer more paradoxical metaphor.

On that occasion, as on so many other, when I finished interacting with Dr. Werner I always felt a strain in the back of my neck, as though I had been looking up at a giant, instead of down at a man many inches shorter than myself.

CONSTANT CHANGE IS HERE TO STAY

Earlier I alluded to what I perceived as Werner's egolessness when it came to his perception of his own role in the history of science. Nowhere was this brought

home to me more clearly than in the following incident which also involved Hal Kelner.

During my third year, I think it was, perhaps half a dozen of us attended a weekly evening seminar on language development at the Werners' home. We would all sit around in comfortable chairs in the Werners' living room. Mrs. Werner would have baked a superb Austrian cookie of some sort—a different sort each week. The cookies and a pot of coffee were always on a wheeled cart. It was the scholarly equivalent of a seminar in heaven, if there is such a thing.

While the principal focus was on language development the discussion was always free-ranging. On this particular evening we got to talking about the difference between Piaget's and Werner's views of development. Werner had just explained that Piaget seemed to view development as close-ended, with formal operations being the final end-state of the process of intellectual development. His own view, in contrast, was that development, in all areas of functioning, was an open-ended process in which, as long as the organism lived, each highest level would eventually be transcended and subsumed under some new, still higher level of integration.

As Werner finished his statement Hal Kelner, quick as a whip raised his hand and, coming from his Talmudic background, says, quite cleverly he thinks, "Dr. Werner, if everything you just told is us true, then some day everything you just told us will be proven false." The young disciple confronting the old Master with a ***gotchya***! Werner's Zen-like response was, "I hope so." The implications in that context were clear: Only ideas, theories, and experiments that people care about, that have some importance or impact, are repeatedly tested and, ultimately proven "false"—subsumed under some higher order, more integrative set of principals. Only theories that no one cares about, that have no impact or importance. remain unchanged, because no one is interested enough to text their limiting implication. Kwatz!!!!

CONCLUSION

In the title of this memoire I describe Heinz Werner, my beloved friend and teacher, as my spiritual grandfather and a little giant with transparent blinders. It is my fondest hope that some of the stories I have related here will help the reader understand more deeply the meaning which that title and my personal relationship with Dr. Werner has had for me ever since I first met him.

11

FEELING FOR OTHERS: WERNER'S INTERPERSONAL STYLE

Robert Baker

The very first time I met Heinz Werner was when I was an applicant for graduate study at Clark, some time prior to the Fall of 1948. It was in his office, on the third floor, Woodland Street side of Clark Hall, in a very handsome wood-paneled office in the approximate location—unfortunately—of the current men's "john." I don't recall anything that was said in that meeting, only that he was very gracious and warm. The man and the setting together were quite impressive; I can still very clearly visualize and otherwise sense it these 50 plus years later, I'm sure much more due to the character of the man than the setting, conservatively elegant though it was.

If memory serves me correctly, I took three courses from Heinz in my first couple of years of graduate work. One, traditional experimental psychology, I don't remember much about except that the content wasn't very central to my interests but very well taught. A second course was probably the very best course I ever had anywhere in any subject, a combination advanced undergraduate/graduate level lecture course in developmental psychology that was excellently organized and presented with, you would know, an approach that was very different from traditional American-style developmental psychology though including coverage of important segments of that kind of material. The approach, of course, was distinctly Werner's, one of the important readings being his ***Comparative Psychology of Mental Development***, with a liberal dose of Piaget, and a large syllabus of other materials. It was a tough course in terms of the amount of material to be mastered, but intellectually invigorating. The third course with Heinz, taken sometime beyond the first year of graduate study, if I remember correctly, was a seminar in developmental/genetic psychology, a little disappointing because it consisted mainly

of presentations of papers by the graduate students and consequently hearing less from the man who had taught such a great earlier level introduction to developmental psychology.

In the latter portion of my time in graduate school I was approached by either Bernie or Edith Kaplan, or maybe both, who had been "commissioned" by Heinz to ask me if I would consider doing my doctoral research with him, in a study of schizophrenic language using the Word Context Test, which had been developed earlier by him and Edith Kaplan. I believe that his use of the Kaplans as intermediaries was his characteristic thoughtfulness in dealing with others, including students, expecting that it would have been easier to say no to them than to him. I was very much honored by his offer and of course jumped at it. Easy accessibility to him and to his time and talents was always another of his admirable personal characteristics, and this was especially true in the whole course of my doctoral research. It was a marvelous learning experience, and he was an extraordinarily considerate, gentle, and giving mentor.

My recollection is that my fellow graduate students, as certainly was true of me, stood in considerable awe of Heinz Werner, and we always (possibly excluding Bernie and Edith Kaplan, who had been close to him since their time in Brooklyn College) addressed him as "Dr. Werner," or "Professor Werner." But, if not actually before I completed doctoral requirements, certainly soon after joining the Department faculty in 1954, Heinz began gently urging me to call him Heinz. This was not at all easy for me to do, because of the very great respect and admiration I had for him, and despite my affection for him and his graciousness in asking that I address him in that more informal manner. Gradually, as the years went on, I became more comfortable in doing so, maybe about as comfortable as I would have been in calling Thomas Jefferson by his first name.

Speaking of Thomas Jefferson—he could not have administered the Department and run its meetings more democratically than did Heinz Werner. From the time I joined the faculty—young, barely out of my 20s—with a new Ph.D., I was made to feel by Heinz's manner that I had as much right to express my opinion and vote my conviction as anyone else in the Department. Everyone else apparently felt the same way, because Department meetings could sometimes become quite raucous, with graduate students saying that they could stand in the hallway outside the G. Stanley Hall's office (Heinz's office, where Department meetings were held), and hear what was going on through the walls and closed doors. And, what I regard as another expression of the manner of Heinz's leadership, good feeling would continue to exist among the Department members no matter the argument, whatever it was—no small achievement. One time, after a particularly noisy meeting, Tamara Dembo playfully presented Heinz with a gavel and wooden base on which to pound it, to be used for a certain mode of control of our meetings, which of course was never to be used by Heinz—it would have been very much out of character.

Heinz was an exemplary model of pure, traditional scholarly values. One time I walked into his office for a meeting with him, and he was standing at the window,

looking out pensively. When he became aware of my presence he said quietly what a nice situation he had. He had a very nice office in which to work, secretaries to help him, interesting people to work with, opportunity to do exactly what he wished to do in his work, and people who were willing to pay him on top of that. There was nothing artificial or self-congratulatory about his statement; it was simply an expression of how lucky he felt he was.

But he wasn't all work. One Saturday evening he was going to his office to pick up something or other, and, on passing the graduate student lounge he saw a light on, and went in and found one of our female graduate students reading. He asked her what she was doing, and she said she was studying for prelims. She reported him later as saying to her something like, "Sometimes on a Saturday night it's better to be dancing."

Heinz was unusually sensitive about how people dealt with each other. He was always prompt in keeping his appointments, and told me something to the effect that if, for example, he was fifteen minutes late for a meeting that involved five or six other people (the size of our Department at the time), and they couldn't begin without him, he would have wasted an hour or so of other people's time. As a different kind of example of his sensitivity to how people treat others, he told me about the time his first wife began to show symptoms of a serious illness, and after the tests were made the doctor called him to his office, informed him that his wife had terminal cancer, and then opened up a box on his desk and offered Heinz a cigar.

In yet another example of this keen sensitivity to others, Heinz once told me about an incident in which he was the culprit and learned a lesson, from a graduate student of all people. One day after a meeting with one of our clinical graduate students (Monte Bliss, by name), probably on thesis supervision or something like it, it was necessary to set time for a subsequent meeting. Heinz consulted his calendar and proposed a time, to which Monte responded that he had an appointment at that time to meet one of his clinic patients (he was training in our Psychological Services Center). Heinz, probably a little put out or pressed for time, pointed out to Monte that their meeting was important, apparently with an implication that it should take precedence. Monte replied that there was nothing more important than his obligation to his patient. Heinz, to his great credit, told me how much he admired Monte for taking the position that he did.

12

PERSONAL EXPERIENCES WITH HEINZ WERNER AT CLARK UNIVERSITY

Arnold Miller

A SKEWED FIRST ENCOUNTER

I first met Heinz Werner in 1954 at Clark University as a candidate for the doctoral program in clinical psychology. My application to Clark's doctoral program had been strongly supported by Chief Psychologist Ted Leventhal and by Dr. Joseph Weinreb, director of the Worcester Youth Guidance Center where I had worked for a year as a Master's level staff psychologist.

I had heard a great deal about Werner's imposing background and his status as a major figure in developmental psychology. So, when I met him I was startled to find that he was little more than 5 feet tall. Naively, I felt that a person of his stature in the field should have a commensurate physical stature. (Werner would have referred to this as a classic example of metaphorical syncretism!) At 6 feet tall, I felt awkward towering over him. To reduce the disparity in height, I leaned sharply to one side. He saw what I was doing and colored. The meeting ended shortly after that.

A TURBULENT TIME

My first two years at Clark were very difficult. I was employed full time as a staff psychologist at the Worcester Youth Guidance Center and shuttled between clinic and Clark. I was also engaged by Clark as a clinical assistant to supervise the clinical work of other graduate students. It was difficult to reconcile my

"grown up" staff psychologist role with that of graduate student. In addition, I was a veteran, married with a small child, and a few years older than most of the graduate students in my class. Clark faculty complained of my arrogance and unremitting psychoanalytic orientation and felt—with some justification—that I was not open to other ways of thinking. Beyond this, in the midst of a messy divorce, my personal life was in shambles and I had difficulty focusing on course work.

Faculty Judgement

One day I received a letter from Dr. Werner to the effect that the graduate faculty had met and decided that my work was unsatisfactory and that there was doubt whether I could successfully complete the requirements of the program even if I attended graduate school full time. I asked for an appointment with Dr. Werner to discuss the letter. This was promptly granted and I met with him in his office—the dark-paneled G. Stanley Hall room—and was gently told that not everyone was cut out to be a psychologist. As Werner spoke to me he opened a case with polished drafting instruments and showed them to me. At one time, he said, he had tried to become an engineer but soon found that engineering was not right for him. And, just as he had, I should consider another career.

Werner Changes His Mind

I protested with some vehemence, saying, "Dr. Werner, I am just now able to work!" He was taken back by my intensity and, after a time, relented—saying that I could continue taking courses for the time being with the condition that I give up my staff position at the Worcester Youth Guidance Center and devote myself full-time to graduate school studies.

I did so. And—with the encouragement of good friends Bill Vogel and Ed Jordan—immersed myself in study and research. Within a year I had published a study on the effect of ascending and descending tones on the autokinetic effect with Heinz Werner and Seymour Wapner, and within two years completed and defended my dissertation on the effect of sensorimotor activity on the maintenance of the verbal meaning of action words. This work was later incorporated in Werner and Kaplan's Symbol Formation (1963) and has become one of the cornerstones of our work with disordered children. One of my cherished memories is that of Heinz Werner coming out of the conference room where they had been reviewing my dissertation defense—to where I was waiting in the corridor—and, turning to me with a broad smile, saying, "Arnie, you did a ***goot*** job!"

Shortly after my oral defense—while I was sitting in the outer office working at the typewriter—probably exploring job opportunities—Werner came out of his office, stopped in front of me and said, "So, what are you going to do now? Retire?"

FRIENDSHIP AND LOSS

Our relationship deepened during the remaining five years of his life. We exchanged letters while I was a professor of psychology at the University of Montana. He expressed pleasure with the manner in which I drew upon his work in physiognomic perception to develop a reading program that enabled very limited children to begin to read. He commented that my work was "very European" and urged that I continue to develop my thinking.

In 1963 I put together a symposium on Inter-modal Perception at the American Psychological Association Meetings in Washington, D.C. and invited Heinz Werner to be the discussant. He reluctantly declined because of his health. He died one year later just as I began a research appointment at Harvard Medical School. Our book ***From Ritual to Repertoire*** is dedicated to Heinz Werner's memory as is the main conference room at the Language and Cognitive Development Center, a school and clinic for children on the autism spectrum which my wife and I founded and have directed since 1965. My chapter in the present book—*Heinz Werner: Catalyst for a New Way of Understanding and Treating Children with Autism Spectrum Disorders*—suggests some of the many ways in which his thinking influenced our work.

A MULTI-DIMENSIONAL VIEW OF HEINZ WERNER

Werner's flexibility was evident in his ability to change his mind and allow me to continue in the program. As a strong personality, he brought with him from Hamburg, definite views as to the proper role of a graduate student that shaped the ambience of the department. He felt that a graduate student working toward an advanced degree should be totally immersed in learning and research .to the exclusion of all else—including the mundane task of earning a living. The positive aspect of this is that we students not only conducted research, we would discuss and argue theory and research with great intensity—sometimes for hours at a time. The quality of these exchanges was reminiscent of my experience at City College of New York where students were expected to challenge professors and engage in dialectic fencing matches. It also had something of a talmudic quality where chasidic scholars removed from the world would dispute the interpretation of obscure passages of the Talmud. Bernie Kaplan, Werner's protégé and collaborator, would delight in "taking on" students in this way.

Werner's mind set necessarily affected the way he viewed clinical students. From his perspective, clinical students who would ultimately practice psychotherapy and (in his mind) earn a great deal of money, did not fit his model of the true scholar-researcher. Clinical students picking up on this were careful—if they happened to purchase a new car—to park it where he wouldn't see them use it.

As a Teacher

Werner taught the graduate course in human development. He was an interesting, well-prepared lecturer who would periodically leave openings for questions or comments from the students. If he liked the question or comment, he would engage the student in discussion for a few minutes—creating an envied aura around that student. However, if he did not like the question or comment, he would look at the clock while the student was talking, as if to say, "How much longer must I bear this?" The effect of this on vulnerable students could be devastating.

Werner would give formidable assignments for papers. I remember one: Account for the Development of Form Constancy among Children. He would also delight in vivid demonstrations to make a point. On one occasion, while discussing the role of experience in perception, he drew a complex form on the board and asked if anybody could recognize what it was. When none could do so, he took a board eraser and created a narrow space between one part of the form and another. At that point it became evident that the form consisted of the word *man* written right side up and upside down. His point, of course, was that perception depended not only on experience but the manner in which that experience was configured—a point never to be forgotten.

Idiosyncracies

During the weekly colloquium, Werner would tilt his head back and smoke a cigarette without removing it from his mouth. Students would watch, fascinated, as the ash built up, wondering when it would fall. During these colloquia he would sometimes express exasperation with abstract notions that were not grounded in observable phenomena. On one occasion, when Piaget's use of the concept *schemata* was being discussed, he said, "So where in the body is this schemata located?' And yet, in his later writings he was not averse to bringing in rather ungrounded concepts such as "functional shift" or "dynamic schematizing activity" to move his argument forward.

One of Werner's endearing qualities was his sense of humor. Annually, the graduate students would put on skits related to their experience. During one of these, Werner—very aware of the anxiety that students had about "passing their orals"—parodied himself to the delight of the group, by saying, "You have five minutes to successfully defend your dissertation—or you fail!"

This book—with its personal recollections and chapter offerings—testifies to the extraordinary impact Heinz Werner had on the lives of those who were fortunate enough to have known him. Almost 40 years after his death, he is still very much with us.

13

WERNER RECOLLECTED

Leonard Cirillo

In casting back to my years in residence as a graduate student (1958–1963), I isolated my memories of Werner from those of related times, places, incidents, and people. I have left the results in their somewhat disjointed and decontextualized state. I did not, however, edit out my personal reactions and opinions, although now I cannot tell how much captures the man and his thinking and how much reflects my naïve attempts at assimilation. Sometimes I use quotation marks, but I can be certain only that they surround the sounds of my memories, like the words of pleasant dreams.

Rarely, Werner enunciated metaphysical rules setting the limits on how he thought. For example, the idealist principle "You can't jump over your own shadow." He insisted, "The whole is different, not 'greater than,' the sum of its parts." Some I recall as overly literal translations like the warrant for searching out origins, "Out of nothing, never is there coming something." On continuity-discontinuity, he pointed out that his own orthogenetic principle was stated in terms of continuity, "*increasing* differentiation and hierarchic integration." More commonly, he concerned himself with methodological advice as in the "blinders" anecdote related by my old friend and apartment-mate, Sandor Brent (chapter 10 in this book). This fits with my impression of him as always mainly concerned with empirical work, however lofty his general viewpoint.

Though he attended carefully to phenomenologists, notably Merleau-Ponty, Werner once followed up his thoughts by noting that one needed to do experiments. Though influenced by neo-Kantian philosophy, he several times mentioned favorably what he had gotten from the positivist, Ernst Mach. Some paper, with Kaplan I think, remarks to the effect that in doing empirical research, whatever one's epistemological position, one thinks like a realist.

Werner's course in experimental psychology, which all first-year graduate students attended, was a treat for me. Configurationist and developmental principles

were embodied in empirical studies. Though many techniques were included, the content of Werner's lectures emphasized generalizable findings. In addition to verbal descriptions, Werner gave classroom demonstrations. I especially recall those using an episcotister to illustrate experimental results, such as those of Fuchs, of the Berlin Gestalt school. Not that Werner referred to schools at all, simply to psychological principles and related empirical research. Every student in the course carried out an original study with the guidance of other faculty, especially Seymour Wapner, and of graduate students like Joe McFarland. These studies were a local topic of controversy because they usually turned out to involve sensory-tonic theory, whether the student carrying out the study was interested or not. Whatever the content, we learned first hand what it is to carry out research addressing empirical questions from start to finish (but not really to finish because publication was underplayed; this was more like practice).

Werner's experimental course contrasted in several ways with his child development course, also taken by all beginning graduate students. For one thing the child development course included mainly junior and senior undergraduates, something we did not like, and a practice graduate students still complain about. Although Werner lectured from his own point of view, he included a standard child development text (in my time, Alfred Baldwin's). Even when organizing the material in his own way, his presentations seemed to me principally descriptive. I later wondered why he did not make more mention of similar descriptive works like Koffka's ***Growth of the Mind***. Werner would organize some ontogenetic changes along dimensions instantiating his developmental principles. For example, he used the dimension "egocentric to socialized" to describe ontogenetic changes that would likely have been attributed to this or that kind of learning by most American psychologists of the time. He was dismissive of the reflex like invocation of "learning" as though behaviorists substituted it for adequately describing or explaining the phenomena of ontogenesis.

Werner's own way of proceeding seemed to me to have the advantage of descriptive breadth in that he continually sought "formal parallels" between ontogeny, pathology, functioning in tribal societies, animal behavior, and so on. I remember my classmate, Bernhard Kempler objecting to Werner's characterization of the thought of primitive man. Bernie cited his teacher at Brandeis, the anthropologist Paul Radin, who had written ***Primitive Man as Philosopher***. Werner responded, inadequately we felt, by speaking of the pitfalls of translating native languages. However broad Werner's descriptions, I hoped for more in the way of general explanation. I suppose I had an American yen for "mechanisms" or "causes." He did have us consider some such matters, especially the heredity-environment question. He assigned Dunn and Dobzhansky's popular book on genetics, but Werner seemed satisfied with generalizations such as the idea that genetics sets limits on the possibilities with environmental events determining outcomes within those limits. Werner's ways of organizing the phenomena of ontogenesis were interesting and heuristically useful, but I found his other work and teaching more exciting.

A high point of Werner's graduate teaching was his advanced seminar on symbolization. This was held in his home in the evening, with a break for coffee and cookies (I particularly liked Erica Werner's apricot cookies). Like many graduate courses, this one was organized around topics and readings chosen by the instructor and reported on by a different graduate student each week. In such seminars, it seemed to me, the bulk of the teaching was assigned to people who knew the least, with just a few comments by the only knowledgeable people in the room. I most looked forward to the comments by Werner and his younger colleague, Bernard Kaplan, to whom Werner often deferred.

The seminar attended to diverse writings, including, one semester, literary theory; the British philosopher, H. H. Price, on perception and memory; Ogden and Richards' classic on meaning; Werner on physiognomic perception and symbolization; and more. I think Werner's presence made the discussions especially stimulating for two reasons. First, his own comments illuminated not only the subject matter but also the background viewpoint from which they derived. Second, his presence encouraged the rest of us to give the topics the care and thought which they deserved. His comments seemed to me fascinating in their expression of a consistent viewpoint, simultaneously entertaining diverse perspectives while maintaining his own. Especially appealing was the transcendence of disciplinary boundaries that some psychologists seem to use to narrow their range of vision rather than to heighten their focus. Even though I had been a lit major for a while in college, I was intrigued by an idea that Werner took for granted–that literature and all art forms are world building.

A couple of events in the course stand out for me because I was involved. I reported on physiognomic perception and symbolism. This was simply an explanation of Werner and Kaplan's own work, but I was thrilled when Werner told me afterward that I had done a better job than he could have. I still treasure the praise even though it is overly generous; I simply paraphrased his original ideas. A second interchange also involved these conceptions of Werner's. I said that I could not see that they offered a general explanation of symbolization. In reply, Werner asked what the alternative was. We had already criticized associationist, including behaviorist, alternatives. I had no others in mind, and thought that not having an alternative did not negate the limitations of his own approach. In retrospect, I am struck by his insisting on a positive contribution rather than satisfying oneself with criticism. The latter, emphasis on criticism, was a limitation I shared with a few of Werner's colleagues and graduate students.

Bernard Kaplan supervised research on symbolization during my graduate years, sometimes at research project meetings. Unlike the perception meetings, these were rarely attended by Werner. Much of the research is summarized in Werner and Kaplan's book ***Symbol Formation***, but other studies, including those following appearance of the book were not published. Kaplan continued to supervise some related research through the '70s and '80s. These contributed to his prodigious undergraduate and graduate teaching, which was a major influence on generations of students, but they did not directly contribute to the

empirical literature. There is room here for further exploitation of Wernerian ideas.

With Seymour Wapner, Werner did actively lead the regular meetings of the perception research group. One cannot over-emphasize the centrality of this research in the department of those years. Much of the sensory-tonic research concerned visual perception. A substantial portion of the space of the department was given over to darkrooms, completely painted flat black and hung with black felt draping to absorb stray light. The department added a mobile lab, a motorized darkroom that could travel to schools, extending the perception research to children. In these rooms, the effects of various sources of extraneous stimulation on the main dimensions of visual space were studied. These studies all bore on Werner's central contention that the various sensory modalities and motor channels are not radically separated from one another; rather, they are differentiated within a common field. Nowadays, there is not a darkroom left in the department.

I recall that the regular meetings of the sensory-tonic project were mainly concerned with planning and reporting experiments. Some ideas would be kicked around in relation to particular studies, but there was little general theoretical discussion. Werner once began to respond to a theoretical question with an explanation depending on the build-up of forces in the visual field with respect to center and periphery. (There is a similar explanation in one of his papers, perhaps his monograph on binocular perception.) I recall Wapner cutting the explanation off in favor of more pressing matters.

The perception research flourished and made a lingering contribution to perceptual theory. That it did so seems to me to depend on its adapting to or persisting despite a hostile theoretical environment at the time. Sensory-tonic theory included as a construct the notion of an organismic equilibrial axis. This was during a period when the version of operationism espoused by many behaviorists seemed to exclude any theoretical constructs. At the same time, the influence on psychology of the Hullian idea of hypothetico-deductive theory may have led to Werner and Wapner's presenting their theory in terms of "postulates" and the like. Perhaps the latter was also made possible by the emphasis in the department of making explicit one's own basic assumptions (and uncovering the hidden assumptions of others).

The sensory-tonic work did not at all exhaust Werner's developmental conceptions of perception. These are apparent in earlier, untranslated work, in his studies of contour (meta-contrast) and binocular perception, micro-scales and micromelodies, and so forth. His handwritten notes[1] include some provocative ideas that I had not heard of before I read the notes, after Werner's death. As an undergraduate at City College of New York, I had learned about the relations between dimensions of intensity, duration, and the like in the form of separate laws, like the Bunsen-Roscoe Law (at brief exposures, intensity and duration have reciprocal visual effects). Werner saw such phenomena in terms of the primitive equivalence

[1] Werner's personal library and his documents are conserved in a reading room in the Psychology Department at Clark University.

(vicarious functioning) of features that are differentiated at more advanced levels. The attenuation of the reciprocity with increasing exposure was for Werner one microgenetic instance of a more general developmental principle.

Earlier instances of his viewpoint illuminating otherwise fragmented bits of empirical knowledge encouraged me to try to hear Werner speak whenever I could. One regular opportunity was provided by departmental colloquia. While the invited speakers often baffled me, the discussion periods were interesting. Werner's younger colleagues could be quite provocative in questioning speakers. Werner was always polite though sometimes damning with faint praise. I recall Herbert Marcuse being invited to speak about the influence of Hegel on modern psychology. He couldn't seem to find any influence, but during the discussion, Werner mentioned several, most notably the influence of Hegel on Werner's own contributions.

When Werner was on the program at psychological conventions, I would go to hear him. Once he was discussant of a group of empirical studies including some verbal research by associationists. I was surprised and interested to hear Werner suggest as an alternative Jung's research regarding the relationship of word associations to "complexes." He seemed to suggest that the associationist approach was limited by its atomism, isolating verbal relationships from one another and from motives and emotions. In his usual fashion, Werner brought in empirical research proceeding from a more holistic or organismic framework.

Although I am curious about Werner's life, education, and career in Europe, he spoke little to us graduate students about it. Of course, I knew vaguely of his having to emigrate and the difficulty in finding a suitable position here. However he spoke so little of such things that a few instances stand out. I remember an offhand remark, for example, about the bohemian character of the psychoanalytic group he knew as a younger man. More important, I remember his expressing anger and disappointment at a few Gestalt psychologists who accommodated the fascists. I also remember his loyalty to other émigrés, mainly his finding a place at Worcester and, later, at Clark, for Tamara Dembo, Kurt Lewin's student and colleague. She often prefaced her contributions to a discussion by noting, "Of course, I am not a Wernerian; I am a Lewinian."

When citing Wilhelm Stern, Werner would sometimes mention having worked with him. He made a particular point of it when he discussed child testimony in class; Werner had a brief, unpublished paper on the topic. He similarly would credit Stern when he brought in the concept of "individuation" as a developmental principle. These were rare events and one would have been hard put to know with which of the many figures he cited in his lectures, Werner had a personal relationship.

This fits with the man's modest style. Some of us had a worshipful attitude toward him, and still do, but this was not something he seemed to seek out or encourage. I can't remember who recounted to me a story Werner supposedly told about himself, one that relies on a few facts about him: Werner was a very short man; he had perfect pitch and was very interested in music (testified to in some of

his research). When he entered University, the story goes, he intended to specialize in music. He went to the first meeting of a class on medieval music, only to find that he had mistakenly taken a seat in a course on idealistic philosophy. He was too embarrassed by his height to stand up and walk out in sight of everyone. So he stayed and became engaged with the subject matter that contributed to his eventual career choice.

The story may be apocryphal but it fits my impression of him–his self-presentation underplayed his intellectual stature. He put forth his ideas and offered critiques in a matter of fact and low-key way, without the fireworks that some others in his field, and in the Clark department, sometimes displayed. I rarely heard him assert himself at all aggressively so that, again, a few occasions stand out. One time, he commented offhandedly on his writing ***Symbol Formation*** with Bernard Kaplan, "That Bernie, he always wants to use a two-dollar word when a twenty-five cent one will do." He once told us graduate students to remove the posters from our working spaces; perhaps, he did not regard such things as decorous. Although totally puzzled, we simply did what he told us to.

Obviously, I found Werner and his ideas impressive not because he boasted or trumpeted his ideas. The remarkable breadth and depth of his views seemed just a part of him. I believe he made many contributions, several unrecognized, to a science of the build-up and breakdown of phenomenal worlds. Though I regret not being able to draw a more adequate picture of my teacher here, I find consolation in the observation by one of his guides, Goethe, "One is never satisfied with a portrait of a person that one knows."

14

RELATING TO DR. WERNER: PAST AND PRESENT

*Roger Biba*ce

The verb in the title "Relating to Werner" was selected because *relating* is the continuous present. It is an appropriate choice because Dr. Werner's framework has stimulated me in the past as well as in the present. I refer to Heinz Werner as "Dr. Werner" because I was never part of the scholarly research "inner circles" at work during the 1950s at Clark University. While Werner and Wapner worked on the "sensory-tonic theory of perception" (see Wapner this volume) and while Werner and Kaplan explored the area of "symbol formation" (Kaplan, Josephs, & Bhatia, this volume), I was an outsider with respect to my activities as a clinician, teacher, and researcher.

Dr. Werner was never "Heinz" to me for a number of reasons. Culturally, my use of Dr. Werner's last name was a way of forging a respectful distance between me and a dominant authority in my intellectual life. Even now when I think and engage him in my *private* mental life, it is never "Heinz" but always Dr. Werner. The *public* counterpart for my inner speech is Werner's framework. Below, I will describe the ways in which the private is to the personal as the public is to the impersonal.

RELATING TO WERNER

You must always remember the stupidity of professors. —Heinz Werner

Dr. Werner was my advisor during my years as a graduate student at Clark. In those days, graduate students were *required* to attend Colloquia. In fact, if I were absent from such a talk, Dr. Werner would ask me where I had been! After one

such talk, Werner asked me to drive him home. I agreed, of course. It was natural that he would ask me what I thought about the talk. By that point in my graduate work, I had learned how to avoid some of the more obvious ways of sounding "stupid," such as not making clear evaluative criticisms or even direct questions related to the talk. So I responded to Dr. Werner by saying, "I am not clear regarding what the speaker meant by...." Dr. Werner's response astonished me. "I thought it was stupid," he said. I guess my jaw dropped, and possibly some other nonverbal accompaniments to my astonishment led him to say, "You must always remember the stupidity of professors!" He went on to explain that many professors have "tunnel vision." As "specialists," professors often overlook issues that are obvious to other professionals and lay people.

On another occasion, Werner expressed a similar idea. I was standing next to him, and as we talked, he was skimming the table of contents to a textbook he had received. This table of contents included headings such as "Learning," "Memory," "Motivation," and so on. Dr. Werner pointed to these words, looked at me, and shook his head. In order to understand Werner's objections, compare such titles with the chapter headings in his book *Comparative Psychology of Mental Development* (referred subsequently as *CPMD*)—"The Syncretic Character of Primitive Organization," (Ch. 2, pp. 59–103), for example. Many specialists *begin* with their own focus on a circumscribed topic—like "memory." In contrast, Dr. Werner's framework requires an investigator to study the *development* and *analysis* of such a traditional category. The genesis of any one category, in Werner's structure of ideas, is rooted in the un-differentiatedness from other, abstract categories favored by mainstream psychologists in any one historical era. Beginnings are global and diffuse, as in initial naturalistic observations of a particular that exemplify a phenomenon familiar to laypersons.

THE LANGUAGE REQUIREMENT AS A PREREQUISITE TO THE COMPREHENSIVE DOCTORAL PRELIMINARY EXAMINATION

In the 1950s, all graduate students were required to pass two languages: a Romance language and German. I had no difficulty with French, since that was the first language I spoke. In contrast, passing German was the most difficult barrier to my goal of obtaining a doctorate.

Germany, Germans, and Nazis were all fused in my mind *at that time* in my life. I was born in Alexandria, Egypt, and lived there from 1926 to 1946. Thus I lived in Alexandria during World War II, a time when England and its allies were fighting against the Germans and the Italians. At one point Rommel was less than an hour away from Alexandria, at El Alaimein, and from the British Armed Forces stationed in Alexandria and Cairo. The protection of the Suez Canal was vital to the allies. During this time, I was enrolled in an English private school that was very dedicated to the "war effort."

Even more importantly, my family background reinforced my negative feelings about Germany, Germans, and Nazis. I am a Jew, and I am Jewish in a way that Americans have difficulty understanding. In America, to be a Jew is one's religion, period. But in Egypt at that time, a Jew had a *civil* status as well as a religious orientation recognized by the courts, with a separate judicial system for Europeans in adjudicating civil and criminal proceedings. As a Jew, I had a special animus towards Germany/Germans/Nazis.

Every time the word "Germans" was mentioned, my paternal grandmother, the relative to whom I felt closest, would say *schlecht*. She did not merely say *schlecht*—she spat the word out. It was only many years later, when I was a patient in psychotherapy, that I was made aware of this unconscious "blind spot" (a *scotoma*, as Freud labeled it). My blind spot for Germany/Germans/Nazis was a good example of "syncresis," (Werner, 1948, p. 59, ff) the fusion of a single word with a category, which I as a graduate student learned meant *bad*, an undifferentiated category of Germany/Germans/Nazis!

So the reader now has some idea of what is vaguely referred to in our psychological jargon as an "emotional block" and why I had a tremendous "problem" every time I sat down to learn to translate from German into English! I tried every thing I could think of, including psychotherapy. I even tried to learn by playing an audiotape containing German vocabulary while I slept. Unfortunately, this technological innovation did not work for me!

At that time, the Clark University German language requirement was much harder than that at other universities, where the requirement could be met by passing a national examination limited to the student's particular field. But at Clark, in order to demonstrate proficiency, a student was required to translate not only a psychological experiment, but also a selection from a German literary work, a much more difficult task. My difficulties and failures had attuned me both to these easier requirements at other universities and to the difficulties in passing German at Clark. One graduate student had flunked the exam eight times! Of course, as a result, this student was not eligible to take the doctoral prelims in psychology.

Prior to my fourth attempt, I had been given a written notice by the department stating that my status as a graduate student was in jeopardy. At that time, I felt it was do or die. Dying may sound too dramatic, but consider these consequences. If I failed German, my status as a graduate student in psychology would have been terminated, and given that foreign students were allowed to remain in the country only as long as they were full time graduate students, I feared that I might be forced to leave the country. No other option was attractive. I could not go back to Egypt, and although I had a Spanish passport, I did not speak Spanish and had never been to Spain. I have articulated this sequence because it highlights how a single outcome—one part—can have a drastic effect on the whole of a person's life.

Dr. Werner was the faculty member who accompanied me to the examination. The psychological selection Dr. Werner made was an experiment in the area of perception, which turned out to be easy. Even I, by that time, could translate *perzeption* into *perception*! We walked down three flights of stairs in Jonas Clark Hall to the

office of the German professor who administered the examination. This examiner leaned back in his chair and pulled a volume of Goethe from his bookshelf. Goethe had been praised as a stylist whose meandering, convoluted sentences were admirable to German scholars! Even as I write this nearly five decades later, my heart is pounding. I stumbled and fumbled in my translation. Dr. Werner added a word here and there to get me back on track. And Dr. Werner even *argued* with this German professor, his neighbor, regarding the acceptability of my translation, based on what Goethe might have meant and the various ways each sentence could be translated. The entire session was, and still is, one interminable and tense blur. What I now remember is the outcome, standing outside the office, Dr. Werner patting me on the back. It was over; I had passed!

RELATING TO WERNER'S FRAMEWORK

Werner's Reminder: Mendel Flunked Biology

Faculty in the Department of Psychology at Clark evaluated graduate students twice a year. Graduate students who were evaluated negatively were in danger of being asked to terminate their studies. Faculty discussion would move, slowly, towards a final group decision. At such a time, so the story goes, Dr. Werner would remind the faculty that "Mendel flunked biology" Mendel, who flunked biology later, became the creator of a biological science—genetics. The implication is that one should consider, with respect to every individual, the range of "entirely different levels of development" *within* that person. Dr. Werner's coexistence concept of development was not just a "concept," it was a maxim he implemented in his "world of action" as a psychologist and chair of the department. This is an example of how Dr. Werner particularized the coexistence concept of development.

WERNER'S COEXISTENCE CONCEPT OF DEVELOPMENT

In the opening pages of *Comparative Psychology of Mental Development*, Werner states,

> "The genetic approach is of essential importance even in the study of the mental life of the adult normal man, for the following reason. The normal man does not always function on the same level of mental activity. The same normal individual, depending upon inner or outer circumstances, may be characterized by *entirely different levels of development*" (p. 4, italics added).

Werner here is pointing to issues that have been neglected for decades. In making this statement Werner is not merely claiming that there is variability observable across different levels of development among groups of people, compared with respect to chronological age, for instance. Another example is the designation of different ethnic groups as being "lower or higher" with respect to their

developmental status by psychologists who focus on a socio-cultural level of analysis, but who never address individual differences within a culture. The example of individual differences, the focus of differential psychology, leads to conclusions that individual A is more intelligent or has greater ability than individual B.

None of these orientations addresses Werner's focus, which is intraindividual variability. As Werner stated, the range of "entirely different levels of development or intra-individual variability . . . " can be brought about by "inner or outer circumstances" (p. 4). He adds, "An adult normal person is not the same when he is utterly distracted." Some seven decades later many contemporary Americans would agree that no individual is "the same" when he or she is "stressed." A person is not at the same level of mental development when stressed compared to when that same person is in a "state of sober scientific or practical work" (p. 4). Note especially that Werner includes "practical work"—the everyday world, the activities of normal adults, not only the abstract world of the scientist. Again, "entirely different levels of development" are posited for a normal adult person who is in a state of "emotional surrender to people or things" (p. 4).

RELIANCE ON WERNER'S COEXISTENCE CONCEPT OF DEVELOPMENT

Werner's coexistence concept of development (CCD) has been utilized empirically to account for intra-individual variability, in addition to expectable differences among groups of research participants. Intra-individual variability is the causal reasoning of children, adolescents and normal adults when they are asked to account for the causes and cure of diverse diseases. Reliance on such a concept requires one to account for the range of psychological processes which coexist within each person, regardless of the age or category (e.g., immature/mature) to which that person is assigned. (Bibace, Schmidt, & Walsh, 1994; Bibace, Sagarin, & Dyl, 1998; Bibace, Dillon, & Sagarin; 1999). The clinical implications of Werner's CCD for the education of children with asthma has also been explored (Bibace & Leeman, 1999). Or in a critique of the research by a number of other investigators (Bibace, 2001) Lastly, this concept constitutes an important aspect of my partnership approach to clinical, research, and teaching activities (Bibace, 1999). Werner's CCD also has very general implications for appreciating phenomena in everyday life.

The emotional surrender of over one billion people who watched the World Cup soccer games on TV illustrates Werner's point here. *Participating* emotionally in the game, wearing the same shirts as the players, yelling, screaming when "they" scored a goal. The national significance of these events was central to countries as disparate as Brazil, South Korea, and Germany. The political leaders of the countries also "participated" in these emotional displays, welcoming heroes such as Ronaldo, who scored two goals for Brazil against Germany.

My interpretation of this type of "emotional involvement" in an event is that it is "enjoyable" precisely because "I am there" for the duration of the match. I

am there in the sense that I am not thinking or feeling anything else about my past, my future, or me. I am cheering with those groups of people who are "with me" and against the opponents, the opposite team and their followers. In sports, the pleasures and pain experienced through participation as a mere spectator are universal for a fan of that sport.

What is the relationship of the self as spectator to these players on the television screen? My formal proximal analytical interpretation is that, momentarily, there is a lack of differentiation between the self and the players on the screen. The yells of pleasure; the groans of pain; the flares of anger at a player on an opposing team who "fouls" one of my heroes is shared with other viewers who are on "my side." Many of these people were not merely watching television—they were there! Such a proximal formal analysis focuses on the "here and now." A formal analysis does not seek to understand the history of each of the viewers and the reasons for their feelings. It is clear that events, such as sports are treasured precisely because there is, momentarily, an emotional surrender of the self. There are, of course, numerous other classes of such events, in politics, religion, and so on, which share some of these same characteristics.

But how is one to categorize the disproportionate emotional reactions of some spectators? Clearly, "early versus later levels of development" is not a good fit for the hooligans in England who were deprived of their passports by their own government because of the disturbances they had created in other countries. Nor is "early versus later levels of development" a good fit for the categorization of the leaders and the nationals of two South American countries who went to war over a contested soccer match!

Even the "immature compared to mature" designation for "entirely different levels of development" does not convey the potency of these qualitatively different ways of being in the world. Constrained by my egocentricities, as in my socialization as a psychoanalytically trained clinician, I prefer the categorization of such entirely different levels of development as "irrational compared to rational." What should be added is that both Werner and Freud recognize such irrationality as enjoyable! Such experiences are enjoyable because the emotionality is, for most television viewers, safe.

Psychologists who think the above may be true but trite are reminded that some contemporary cognitive scientists consistently reject such a differentiation between self and the world, between internal and external circumstances. Rather, they insist that such conceptual distinctions are unnecessary "spatial metaphors." The simultaneous orchestration of private, internal psychological states and external expressive behaviors is coherently integrated for that viewer on that occasion. The contents of their behavior, the diversity of means relied upon by that viewer are congruent with that person's ends for that event. There is, *simultaneously*, the enactment of all these organismic activities in a holistic ensemble for the person who is emotionally engaged—who is there! A Wernerian formal analytical approach allows me to create links between the behavior of particular persons and universals, the forms of organization related to a lack of differentiation between

self and other, a temporary form of a non-serious condition. Or the blurring of psychological states and the external world as the basis for "poor reality testing" and severe psychopathology. Or for the multiple ways in which people deceive themselves. Common psychological defenses (identification, projection, reaction-formation, and so on) have been analyzed through the differentiation and transformation of actor/action/object propositions (Bibace, Marcus, Thomson, & Litt, 1987).

Analyses that focus on "forms of organization" are generalizations that can be particularized through categorizations, such as "early versus late" and "immature versus mature levels of development." These categorizations make sense to specialists who are devoted primarily to one or another developmental series, such as ontogenesis. I would like to underscore the importance of the shift between such formal analytical statements for these "entirely different levels of development" and the labels or the categorizations by which Werner designates these different levels within the "same normal adult man." The reader is reminded that it was only in 1994 that the APA introduced nonsexist language!

Werner underscores the range of levels of mental development because "at one time man behaves primitively" (Werner, 1948, p. 4) and at another he becomes relatively "cultured" (op cit.) and "civilized" (op cit.). Werner—while writing in English—puts these words "primitive," "cultured," and "civilized" into quotes. There is no invidious comparison here between individuals, or between groups characterized in diverse ways. Rather, Werner is referring to the same person, a normal adult who at one time behaves "primitively" and at another in a relatively "cultured" and "civilized" manner.

There is a shift here from the conceptual referent, stated in the formal language of lack of differentiation between the self and the other, which is the basis for "entirely different levels of development" or what is generally recognized epistemologically as different levels of organization, to the *categorization* of these different levels of organization. It is precisely this shift of focus from "form" to a "label" for the "contents" that has proved to be difficult and controversial.

Werner's concept of development (Werner, 1957) is stated, most generally, through the abstract formal language of the orthogenetic principle. But this principle, because of Werner's generality, is utilized to *categorize* very different individuals who belong to disparate groups. The "labels" or categories that are commonly used vary with the kinds of individuals who are being compared. For instance, studies in ontogenesis often categorize these different levels of development as "earlier or later" or as "less or more mature" or as "less or more advanced" in development. Such categorizations have a number of advantages and disadvantages. One advantage of relying on the "early versus late" characterization of development when comparing younger and older children is "transparency" This distinction is considered acceptable among mainstream developmental psychologist. Yet from a Wernerian perspective, this distinction does not acknowledge what most parents and every teacher knows, namely that children of the same age tend to behave at "entirely different levels of development."

Freud, of course, repeatedly demonstrated the existence of "entirely different levels of development" in people, not only through our different states of consciousness, as in our dreams but also through behaviors judged as normal or neurotic. Werner acknowledges and brackets such an "obvious" difference so that "even if such states of consciousness as the dream are disregarded, the normal man does not always function on the same level of activity." (Werner, 1948, p. 4) Freud would completely agree—a normal adult makes unintentional slips of the tongue and parapraxes in actions. But Freud's designation or categorization of such behaviors is different. The general categorization for Freud for such different levels of development within the same person is referenced by the title of one of his books, *The Psychopathology of Everyday Life.*

On the same page Werner summarizes:

> "In general, then, developmental psychology attempts to demonstrate that primitive modes of behavior in the normal man not only appear under certain extraordinary conditions, but are *continually present as the basis of all mental being*, and are of *vital* importance in supporting the highest forms of mentality" (Werner, 1948, p. 4, italics added).

The definition of vital, provided in the Oxford English Dictionary is as follows: "Consisting in, constituted by, that immaterial force or principle, which is present in living beings or organisms and by which they are animated and their functions maintained." Thus, by the use of the term *vital*, I have interpreted Werner so as to make clear that primitive thinking is not merely an unfortunate occurrence, but rather is indispensable in that it helps to support and maintain higher forms of thinking.

It is clear that Gordon W. Allport understood and supported Werner's assumption that all people, even those considered to be particularly sophisticated will make use of primitive concepts at times. Allport, in his foreword to *Comparative Psychology of Mental Development*, provides an eloquent summary of Werner's position:

> [Werner's] vivid accounts of syncretic perception and thought give the reader aid in understanding the ordinary mental operations of himself and his fellow men. No matter how confidently we pride ourselves on our logical acumen and capacity for scientific inference, our thought too turns out to be primitive much of the time. While tactfully confining himself to children, primitives, and psychotics, the author tells us in a sly way more than a little about our own mental lives. (p. xi–xii).

Allport acknowledged Dr. Werner's self-reference to "understand the mental operations of himself" (p. xii). By stating that "no matter how confidently we pride ourselves on our logical acumen and capacity for scientific inference, our *thought turns out to be primitive much of the time*" (p. xii; italics added). Allport made clear that everyone at times demonstrates less sophisticated thinking. Similarly, David Rapaport's review of *CPMD* in 1941 acknowledges this same idea. According to

Rapaport, Werner "shows us that the different functional levels are not possessed exclusively by a group of living creatures but that even in the civilized human being of our times, *the different lower functional levels are coexistent with the highest ones* (Rapaport, 1941; italics added).

PERSONAL AND FAMILIAL MAGICAL BELIEFS AND BEHAVIOR

The following examples from my personal and familial life will illustrate the reasons why I resonate to Werner's notion of primitive ideas. I was born and raised in Alexandria, Egypt, and lived there for the first 20 years of my life. Most Europeans as well as native Egyptians in Egypt subscribed to numerous magical practices, rituals as well as magical beliefs. For instance, many people believed in the evil eye, which must be guarded against and warded off. Children and adults wore a ***chamsa***—a charm in the form of a "hand" to shield oneself from the gaze of the evil eye. Complements were avoided as dangerous. Many people believed that conspicuous consumption was an invitation to disaster.

As a youngster I became infected with a "furuncle," which is defined by Webster as a "boil." More descriptively and specifically, this boil was a purplish looking, round mound with a yellow center, i.e. the pus of the infection. The familial conviction was that someone had put the "evil eye" on me. There it was, the evil eye as a concrete unambiguous manifestation. No doubts about it!

To cite a further example, my father's company had moved to a newer, fancier office. Such a "dangerous" move required the performance of a magical ritual, namely an animal sacrifice to ward off evil spirits. A ritual accompanied by prayers so as to insure success. It was common to display an evergreen plant at the top of the entrance door to house or apartment. Such green plants insured well being. A complement to this green plant was my mother's statement of good wishes every Friday evening, "May your week be green," a magical belief aimed at bringing about good things during the week ahead.

The following example maximizes the range of beliefs and "cognitive levels of development" for me personally. The person I was closest to during my early years was my paternal grandmother, the family matriarch. Fast forward in time to Worcester, Massachusetts. I am a graduate student at Clark University about to take my doctoral preliminary exams. The preparations for this exam had included two years of weekly meetings with a group of four other graduate students. The results of these exams answered a most important question, *if* you were going to get a Ph.D. But it left open the secondary question, *when* you would get a Ph.D.

My grandmother's concern and wishes for a "good result" were expressed through magic. She sent me something through the mail to "ensure" my success. This magically potent thing was some "sand" taken from the grave of a scholarly rabbi. When I telephoned Alexandria to tell my family I had passed, my grandmother interpreted that as verification of the efficacy, the power of what she had

done. As Werner recognizes, "magic achieves systematic expression only when it is on a social, and not an individual, phenomenon" (Werner, 1948, p. 29).

The discrepancies between the *public* "psychologist-in-training" and my *private* experiences could not have been greater, and it is only now, late in life, that I am willing to make public these private personal experiences. Werner's *CPMD* transformed such personal experiences for me by making them general, impersonal psychological processes common to everyone. To use a contemporary cliché, Werner's general assumptions "normalized" such experiences for me. Even the medical jargon (there is a lot of it around) does not match the generality of Werner's assumptions or the evidence for primitivism that I was able to observe, both then and now, in others and myself.

Examples from my peers who were also taking doctoral exams included a graduate student who, since he felt he did well on the first day of the examination "therefore" did not change his shirt for the rest of the week. Why risk changing your luck by changing your shirt? Recently during the World Cup soccer games, the television commentators mentioned that the German coach, whose team had succeeded in reaching the finals, did not change his shirt for the same reason. Even more explicitly, was the colorful magician, with all his magical wands and paraphernalia, who came to the soccer matches from Senegal.

Despite these personal experiences, dreams of reason in my professional life as a researcher persisted. The idea that surely a "mature" person, in their "knowledge domain and their everyday world of activities" would be "consistently" rational. Especially if deviance from socially prescribed behaviors of professionals in a particular context entailed serious consequences for that person's own health. In my research with Mary Walsh, dealing with conceptions of illness from childhood to adulthood, we had adopted the mainstream criterion for determining an individual's developmental level. We relied upon a social cognitive developmental criterion, articulated by Damon (Bibace & Walsh, 1981, p. 44 that the two highest developmental levels in a person's protocol with regard to the definition, cause and cure of an illness, would determine "the" developmental level to which that person was assigned. We were able to empirically demonstrate that the average developmental level varied with chronological age for normal children. This "categorization" was widely used and "replicated," to the tune of roughly 130 science citations in 80 different journals.

It was not until the late 1990s that I explicitly argued for a coexistence concept of development (Bibace, Sagarin, & Dyl, 1998; Bibace, Dillon, & Sagarin, 1999). In the papers, we provided examples of the range of development level from the least to the most mature concept of illness for normal adults and how a normal child could, on the same day for the same concept of illness, demonstrate a wide range of levels of development. The less mature spontaneous answers coexisted with the most mature levels of that particular child's understanding of the definition, cause, and cure of an illness. Coexistence emerged when the children were asked to evaluate responses provided by other children, which acted as concrete exemplars of the categories for every level of development, in the language of other children.

Our approach to understanding concepts of illness led us to create "categories," which linked abstract developmental principles to concrete answers from groups of all research participants, irrespective of age.

IRRATIONAL BEHAVIORS BY PHYSICIANS IN MEDICINE

The coexistence concept of development has been further substantiated by my weekly experiences with faculty family physicians and also as a direct observer of doctor/patient interactions involving residents and faculty family physicians for 15 years. For instance, I had heard the "mantra" regarding the taking of antibiotics for an infected bacterial "sore throat or cold, a streptococcus infection" numerous times. "You will probably feel better after two or three days, but you *must* take *all* the pills." This was accompanied by the doctor's emphasis on the negative effects of terminating the antibiotic prematurely. You can imagine my surprise when some physicians told me that they personally did not take the antibiotics for the entire prescribed period, an example of the expression "do as I say, not as I do." But surely in medicine, physicians would be more rational!

A close faculty colleague in obstetrics carried out a study in the early 1990s on the implementation of universal precautions during childbirth. There is often, contrary to the layperson's idea of what happens during birth, a lot of blood during a delivery. Because of the risk of AIDS and hepatitis, obstetricians had been required to "adhere to universal precautions in a delivery." Universal precautions are designed to protect the obstetrician from being exposed, through cuts on their own body, to HIV. Such precautions include plastic shields worn over the face to protect the eyes; plastic gowns to prevent the physicians from becoming "soaked to their skins" with blood. Especially important are the universal precautions related to the way that surgical instruments grouped as "sharps" (such as scalpel) should be handled.

What led to this study were observations by faculty that some residents in obstetrics and gynecology did not "adhere to universal precautions during deliveries." This faculty obstetrician conducted a classic "before and after" study with an intervening lecture given by a national expert on infectious diseases which emphasized the importance of observing universal precautions in the operating room. The results based on observations of residents before and after the lecture, showed no effect for many residents. This faculty obstetrician reported her findings during one of our weekly sessions with other faculty obstetricians. I had great difficulty in accepting the results that physicians would expose themselves to such severe consequences for their own health. Why? My experience from weekly meetings with third-year residents in family medicine, who also delivered babies, had made me aware that deliveries may occur in the middle of the night, when the physician has had very little sleep. It was understandable, I told the group, that such a physician would not want to put on the special booties and take the time to carry out all these universal precautions when they were tired, when an immediate intervention was

necessary and so on. In other words, my research on concepts of illness was based on the assumption that if you really understood, if you have a mature concept, then your behavior would change. Physicians, in this specific context, exemplified an ideal of understanding, which could rarely be reached by lay people.

In contrast to the previous antibiotic example, no adherence to "universal precautions" in the operating room entailed possible severe consequences for the physical well being of the doctor and other personnel. Bibace and Walsh (1981) had demonstrated that there were differences in the maturity of a person's concepts of the definition, the cause and cure of common episodic illnesses, such as a cold, or severe illnesses, such as heart attacks, cancer and AIDS. The scoring system and the assumptions were based primarily on a medical concept of disease. My hope was that if one could educate, make ordinary people more mature, with respect to their understanding of illness, then they would act in a more rational way. That was why Bibace "the researcher" was now raising objections to this faculty obstetrician's study. I had gone on for some time with these objections when the Director of the Residency Program interjected with this example in support of the findings from this study. It was early afternoon when an experienced obstetrician had come into the operating room to deliver his patient. This faculty obstetrician and the residents were also in the operating room as participants and observers. This middle-aged physician walked into the operating room prepared to begin the delivery. The Residency Director very clearly, directly, and bluntly told him: "You are not observing universal precautions." The Director of the Residency was concerned, he now told the group, that this physician was a "poor model for our residents," to which this obstetrician replied, "Somebody's got to be immune!" He then proceeded with the delivery without having observed universal precautions. This was not just an immature *belief* but a *behavior* considered irrational by the other faculty. That observation had a major effect on me.

CONCEPTUAL RECONCILIATION OF MATURE/IMMATURE BELIEFS THROUGH WERNER'S COEXISTENCE CONCEPT OF DEVELOPMENT

I had previously rationalized the difference between the "do as I say, not as I do" behaviors of some physicians regarding antibiotics. I told myself that such deviations are not that serious; the consequential effects are not immediate; so they are not as likely to lead to adherence. But non-adherence to universal precautions in the operating room can lead to contamination and HIV. To be HIV positive has serious consequences related, to morbidity and mortality, for a physician personally and professionally. Nevertheless, a number of obstetricians (experienced and inexperienced) were failing to observe universal precautions. I use the past—tense because faculty tells me that nowadays medical students are indoctrinated to respect universal precautions.

Parenthetically, I also asked myself another question in a "get over it" moment. How would I, and possibly other psychologists, have reacted if the person who was not observing necessary precautions, such as wearing a helmet when bicycling, was an adolescent. It is a common belief among many social scientists that adolescents behave in dangerous ways because they have a "sense of invulnerability." Werner to the rescue! This is yet another example of the way in which many of us implicitly rely on chronological age regarding our interpretations of the maturity or developmental level of an individual.

Werner's coexistence concept of development, the vitality of the so-called primitive levels of development, can also be illustrated through the *positive* effects of magic. In contrast to many psychologists and scientists who regard magical beliefs as negative, Werner understood the positive aspects of magic. Nowadays, many clinicians and research psychologists have come to respect the positive aspects of magical beliefs. Hope, even when it is irrational according to biomedical standards, is not dismissed by many clinicians in diverse helping professions when they are relating to a person who is dying, or for whom all medical avenues have been exhausted.

Werner's multifaceted analysis of magic includes magic by "analogy or imitation," based on the lack of differentiation between internal psychological processes and events in the environment. Werner states, "When form is given to an image, reality itself is given form and direction. The new attribute, in accordance with the syncretism of this mode of thought, spontaneously *becomes* [italics added] the attribute of the real object" (*CMPD*, p. 350). Werner adds, "in a deeper sense the magical procedure creates not alone an image from out of which the attribute is taken and intermediately transposed; but in creating the attribute in an image, the procedure likewise creates it *simultaneously* [italics added] in the things showing identity with this image. This desired quality, therefore, belongs not to the image alone, but equally to the objects of everyday life involved in the procedure" (Werner, 1948, p. 350). Werner characterizes this transformation, as "creative magic" because "the desired attribute or event is not imitated or copied, but is actually brought into *immediate* [italics added] being and formed objectively through the magical activity" (*ibid*, p. 350–351). This last quotation also illustrates how Werner empathically adopted the perspective of the person whom the psychologist is analyzing. The magician is "creative" not derogated as a result of their beliefs that the desired attribute actually came about. No other psychological processes as "mediation" are required; the effects for the creative magician are *immediate*. This immediacy is again indicative of a lack of differentiation between the person and their environments. It is the lack of differentiation that permits the transformation of external reality. This is just another example of how Werner explores sympathetically both the "positive" as well as the "primitive" aspects of these different levels of mental development, a lack of differentiation between the *subjectivities* of psychological processes of an "image" and the *objectivity* attributed to *perception*.

THE COGNITION OF MAGNITUDE: A COMPARATIVE STUDY OF NORMALS AND SCHIZOPHRENICS

In retrospect, this was my first research study which relied on Werner's genetic parallels, namely, that there are *formal parallels* among various developmental sequences (Bibace, 1956). Although the ontogenetic sequence for the concept of number had been articulated by Piaget, he had not sought to encompass the behavior of a variety of populations within his theory. In contrast, Werner's psychology of mental comparative development posits formal parallels among ontogenetic, phylogenetic, microgenetic, and pathological (organic and functional) processes underlying behavior." Both Werner and Piaget assumed that the development of the category of number—of which the concept of magnitude is one aspect—is one of the basic categories of cognition for the patterning of objectified experience.

The question was not whether schizophrenics are different from normal adults. Rather, the question focused on the *forms of organization* relied on by normal adults and schizophrenics in their concept of magnitude. More specifically, the study focused on a formal part/whole analysis of what the subjects' responses entailed. The schizophrenics who were selected for this study demonstrated "formal thought disturbances" *at the time of testing*. It was hypothesized that the forms of organization, posited by the orthogenetic principle, would parallel the ontogenetic forms of thinking Piaget had constructed for his studies on number with children. Such parallel forms of organization have been referred to and categorized by various authors as variations in maturity, earlier-versus-later development or, as in this study, indicative of normal-compared-to-abnormal populations.

The results were interpreted as substantiating the hypothesis. In one part of the study, different versions of the following question were asked of normal adults and schizophrenics:

> There are 60 wooden beads in a box.
> ALL (emphatic tone) the beads are made of wood (Whole).
> Of these wooden beads, 40 are white (P1)
> And another 10 are brown (P2).
> Are there more wooden beads or more white beads?
> Are there more wooden beads or more brown beads?

Both children, in Piaget's study, and schizophrenics, in contrast to normal adults, answer that because P1 (40) is > than P2 (10), then P1 is > than the Whole. Some schizophrenics also reduced the whole to P3, the 10 beads with no color, so P1 is bigger than the Whole because P1 is > than P3.

Another major similarity between Freud, Piaget, and Werner is their positive valuation of errors. The detailed analysis of how a person reasons so as to produce a "wrong answer" illuminates how the mind works. Errors can show doubts and vacillations in a person's answers and in the ways they correct themselves.

Public disclosures of their private mental representations are a worthwhile focus from this perspective. In contrast, a "correct" response, without knowledge of the underlying psychological processes, yields little understanding of how that person "achieved" that answer. This issue persists today. Should one focus on outcomes, evaluations, achievements, and manifest behavior? Or should one also take into account the processes, at all levels of organization (biological, psychological, and socio-cultural), that determine *how* the former comes about? Werner, Piaget, and Freud all agree that the former is necessary to understand the latter.

Current Interpretation

Included below are my current interpretations of the study on the cognition of magnitude. Rereading this study in 2003, the following "self-critical" comments come to mind. First, my study was limited to schizophrenics with formal thought disturbances. Secondly, the study was limited to male participants only. I did not state in my dissertation, publicly, the reasons behind this decision, namely that female schizophrenics were believed to be more "variable" than males. In retrospect, this is interesting because of the following incongruities. My clinical experiences in descriptive psychiatry did not provide *any* basis for gender differences in formal thought disturbances. For both my descriptive psychiatry teacher, Dr. David Rothschild,[1] and his mentor Eugene Bleuler, a formal thought disturbance (such as a loose association) was a judgment to be made irrespective of gender! For Freud, the distinction between primary and secondary processes transcended gender, SES, and ethnicity. Similarly, Werner did not relate forms of organization regarding "entirely different levels of development" to gender.

So why was my sample of schizophrenics limited to males? I now think that one reason was because of the major programmatic research conducted by Leslie Phillips in the psychology department at Worcester State Hospital. The aim of the research project was related to the creation of a scale based on a schizophrenic patients' "pre-morbid" social attainment. One component of this instrument, which came to be known as the Worcester Social Attainment Scale, was an assessment of the respondent's occupational status. The official *United States Dictionary of Occupational Titles* assigned different degrees of "complexity" to different occupations. For example, a janitor's occupation was less complex than that of a mechanic. These differences in "complexity" were interpreted as indices of lower or higher levels of development. The Worcester Social Attainment Scale was limited to males because in the 1940s and 1950s there were relatively few females in the workforce, and accordingly, the range of occupations open to women in American society, at that time, was limited.

[1] Dr. David Rothschild, director of Clinical Psychiatry at Worcester State Hospital while I was an intern, studied with Eugen Bleuler in Switzerland.

Historical Eras as a Factor

It was only much later that I began to appreciate the importance of the historical era as a factor in science. It was only in the 1970s and 1980s that I became familiar with Foucault's thesis that the "episteme is rooted in time" (Foucault, 1970). Epistemologically, there are, at any one time, paradigms that reflect mainstream science. Of course, as a scientist I could have had the courage to argue that a "representative sample" of schizophrenics should include females as well as male patients with formal thought disorders. But I did not. That would, practically, have had the consequence of doubling the statistical comparisons required in the study—normal (both male and female) compared to schizophrenics (both females and males). Note also how "complexity" is evaluated in antithetical ways. In experimental design I avoided it as impractical, yet as a researcher I subscribed to "complexity" as an indicator of a higher developmental occupational status!

There was yet another very practical reason for limiting myself to males. I needed patients for my study who had severe, "obvious" formal thought disturbances, and there were not enough such patients at Worcester State Hospital. Herb Lipton, a fellow student and friend, invited me to come to the hospital where he worked, a Veterans Administration hospital. Again, in that historical era, the veterans from World War II and previous wars were almost without exception males.

I have dwelt on the "historical era" as an influential factor because others as well as I may not be sufficiently sensitive to the ways in which interpretations are impacted by our contemporary zeitgeist. Sexism and feminism in the 1950s were not pre-potent in the consciousness for lay people, scientists, or psychologists. Similarly, such oversights are evident in Werner's *Comparative Psychology of Mental Development*, written in the 1920s in Europe, and even in Allport's foreword to the 1948 version, written in the U.S. Similarly, our current historical era has made terms such as "primitive" or "native" politically incorrect. Yet, paradoxically, it is still quite acceptable to refer to countries as Third World, compared to post-industrial nations such as the U.S. or some nations in Europe.

Often times the valence of a particular word is highly reflective of a particular culture and/or historical era. A given term may have both positive and negative connotations as well. For instance, consider the terms "consistency" and "variability" Each may have positive and negative connotations for the interpreter. Consistency can be interpreted positively as *stability* and negatively as *rigidity*. Similarly, variability can be interpreted positively as *flexibility* and negatively as *labile*. The choices of the interpreter are pervasive and unavoidable.

Werner's *CPMD* also demonstrates another relationship between what is to be explained and the explanation. In this early comprehensive work, he relies on a "one: many" relationship between the forms of organization and the phenomena to be explained. So, for instance, the lack of differentiation between the self and the other is explored in multiple sociocultural contexts in organic pathology and psychopathology, in microgenesis as well as in ontogenesis. One characterization

of the forms of organization between the self and the other, namely the lack of differentiation between self and other or between self and the inanimate world, is relied upon to explain many different phenomena. Werner, in this respect, is quite different from Piaget, who limited himself to science as the domain to be explained. This Wernerian reliance on **one:many** kind of relationships parallels Freud's perspectives. For Freud, the forms of mental life and their psychological representation were characterized as "primary versus secondary processes." Diverse psychological processes were used to explain levels of consciousness, levels of maturity (normal/neurotic/psychotic) and the "psychopathology of everyday life"—slips of the tongue and other parapraxes. For Werner, Piaget, and Freud, the relationship between *form* and *content* is that of abstract to concrete—abstract forms of organization referring to concrete phenomena. Form is the abstract generalization that transcends the particular, which is to be explained.

COEXISTENCE IDEA: FROM PERIPHERAL TO CENTRAL IN THIS AUTHOR'S UNDERSTANDING OF DEVELOPMENT AS A CONCEPT

The 1956 empirical results indicated that normal adults as well as schizophrenics were relying on immature psychological processes which were formally similar to those forms of organization in this schizophrenic group. But this was acknowledged at that time merely as a footnote: "some normal adults, although they do not show the primitivity of schizophrenics, also rely to some extent on primitive operations in thinking" (Bibace, 1956, p. 81)

In sharp contrast, as the above attempts to demonstrate, I now think that Werner's coexistence concept of development is central to a comprehensive concept of development—a concept for such diverse domains as science, art, and religion, but also a concept which has implications for how people behave toward one another in their everyday activities.

I have interpreted the approach of John Rawls's value orientation to "Justice as Fairness" as one such possible positive and meaningful consequence of not making *any* differentiations with respect to other human beings. Rawls's thought experiment and his orientation to values requires one to posit no differentiations whatsoever among any human beings. Justice as fairness is the emergent from dialogs based on such a premise. Initial reactions to such an idea will be to dismiss the idea as absurd. Indeed, Judith Rick Harris, a developmental psychologist, has more empathically voiced the dilemma in such a proposal, when she asks, "How can we reconcile our desire for fairness and equity with the brutal fact that people are not all alike?" (quoted from the *New York Times*, Dec. 30, 2000).

There are at least two historical examples that underscore the value of the proposal by Rawls. First, the Bill of Rights in the Constitution, which for every American was, and many would say, still is, counter to the facts of racism, sexism, and ageism of everyday life. Second, the Universal Rights adopted by the United

Nations, initiated by Eleanor Roosevelt, are even more blatantly violated with respect to millions of people worldwide.

Three important assumptions are part of my heritage: ideals have to be "posited" not abstracted from empirical facts or the sensory manifold; positing ideals will lead to the search for means to implement the ideals. Such ideals enable us to overcome the barriers and inevitable conflicts we will encounter as one spirals from past to future.

INTEGRATION AS ORCHESTRATION

I was talking to Dr. Werner about the concept of "integration." Going beyond the mantra and the clichés commonly relied on by me and some of my peers, Werner restated the formal abstraction of "integration" through a concrete idea: orchestration.

There are advantages to construing "integration" as orchestration. Orchestration is a concrete analogy for this writer, which helps me to clarify the concept of multilinearity. Ordinarily, multilinearity addresses the distal ends, or ***teloi***, for divergent domains such as science or aesthetics. But these domains are so varied, in and of themselves, that comparability is difficult. A common critique is that cross-cultural comparisons that rely on mainstream Western methods of assessment and evaluations to reach conclusions regarding other groups or cultures are not taking into account the actualities of this other culture. Such comparisons are not only epistemologically invalid, but they disregard the world of everyday activities for people living in these other cultures. What those people in other cultures, according to *their* standards, find acceptable or not acceptable is disregarded.

Orchestration as integration is also constrained to a coherence theory of truth rather than a correspondence theory of truth. The music or products considered beautiful in one culture violate the canons of what is culturally acceptable as beautiful in another culture. Leonard Bernstein asks whose musical notations should be relied upon in making an evaluation of music: "the twelve notes of our Western chromatic scale, or the five notes of the Chinese pentatonic scale?" (Bernstein, 1973, p. 57). Indeed music within one culture, or a particular historical era within a culture, suffers the same fate—novelty is often not accepted. The idea of relying on orchestration as an analogy for integration should be recognized as subject to such a limitation.

However, reliance on orchestration as a way of thinking about integration has some advantages. Orchestration clearly relies on a "relational" concept, not a substantive, focus on one part, or a musical note. A musical note only gains its meaning from its relationships to other musical notes, musical chords, and themes. This musical analogy also makes it clear that one part, a musician or an instrument, can play an infinite variety of sounds, songs, or symphonies. That is, a one-to-many abstract formal relationship is stated concretely in a way that is readily

understandable. Conversely, many parts, many instruments, many musicians can all play in unison—united by a musical theme. This, in turn, exemplifies the abstract many-to-one relationship of analogous processes—so familiar to Wernerian developmental psychologists—that serve the same function.

Most important, the many-to many-relationships, between means and ends, between musician and orchestra, are easily conveyed, such as when an orchestra plays a particular song or symphony. Orchestration allows the abstract notion of integration to be flexibly enacted in that various parts (instruments, musicians) are central and/or peripheral in diverse segments of the "same" piece of music. This orchestration metaphor can be extended further to include the concepts of sequence and simultaneity. Sequence is essential to melody, just as simultaneity, the immediacy of all of the music, is essential to the "experience" of music. This is surely a simplification, but it may have implications that are worth pursuing. To concretize the idea of orchestration further with respect to sequence and simultaneity: sequence is essential to melody, just as simultaneity, the immediacy of all of the music, is essential to the "experience" of music.

Werner distinguishes the immediacies of the world of action and perception by a participant compared to an appreciative observer. Many would agree that there are major differences between a person who can "only appreciate music experientially" and a person who is a musician, who plays music.

There is another aspect of this orchestra analogy to be considered, namely, the audience as a group, or a particular listener. The orchestra analogy takes into account the significant differences, for both groups and individuals: *who* is the player, the conductor, or the orchestra. The same symphony is often played by different orchestras, conductors, and players, but a particular listener likes one version and dislikes others. One potential explanation for this phenomenon is the notion of *style*. Style here means an integration or putting together of all the notes in a distinctive way, which differentiates one rendition of a song or symphony from all other renditions of the "same" piece. A particular *style* can unite both player and listener as "partners," who are not equal but who complement one another (the musician needs the audience just as the audience needs the musician). Further, there are reciprocities between the audience and the performer, such that the performer may acknowledge that this audience, or even a particular person in the audience, enhances his or her performance (Bibace, 1999, p. 284–285).

This orientation toward integration also permits a Wernerian framework to go beyond a formal proximal analysis. How so? The musicians' instruments are all there, all of the time. They are all present from start to finish. The formal cause is thereby connected to the predisposing cause. The characteristics of the instruments, in and of themselves, hinder or facilitate certain sounds and the particular type of participation in the musical composition as a whole. The material cause, to pursue Aristotle's four causes, is also represented in the "sounds" made by the orchestra. As is well known, sounds have specificities in meaning *physiognomically.* A high, tinny sound cannot represent either a fat person or a sensuous musical

passage. Orchestration addresses the precipitating cause, the sequences that herald the figure/ground relationships between the players, their instruments, and a passage in the musical score. A radical cause can also be represented musically, by a discordant note negatively or by an unexpected positive note or theme. The saliency of a note or a series of notes or passage can often be represented musically.

Orchestration can also be construed to address two distinctive abstractions in Werner's domains of scholarly work: perception and symbol formation, namely, simultaneity and sequence. Just as the orthogenetic principle requires the criterion of *sequence,* a coexistence concept of development posits *simultaneity.*

An orchestration analogy facilitates my interpretation of Werner's *CPMD* as being based on two contrapuntal themes. Sequence, the basis for one theme, culminated in the orthogenetic principle of development, and the lesser recognized theme, *coexistence,* was posited by Werner as "vital."

The vitality of these themes in Werner's work is manifest in one of his earlier publications: the "Unity of the Senses" (Werner, 1934, in Barten & Franklin, 1978). The orchestration of such contrapuntal themes in the immediacies and the coexistence of emotion and perception in physiognomic perception in normal development are followed by a geometrical-technical perceptual orientation to the world. On a related note, in his more general exploration of the ways in which the senses are unified, Werner referred to the phenomenon of synesthesia. For Werner, synesthesia "mean[s] that one specific stimulus may arouse not only the specifically corresponding sensation, but a second sensation united with the first (p. 86). [A common instance is color-tone synesthesia, as when the perceiving individual sees color while listening to tone.] Werner's *CPMD* makes it clear that both physiognomic perception and synesthesias are phenomena demonstrable in children, schizophrenics, brain-damaged individuals, and creative people, as well as in normal adults.

The contrapuntal theme in Werner's work is also manifest in a theoretical and methodological approach that analyzed the forms of organization attributed to phenomena and that avoided distal, material, and causal explanations. Werner insisted on "probing" for the latent, multiple psychological processes that underlie a behavioral product.

The reconciliation of this counterpoint requires the psychologist to pay strict attention to the *description* of the content of the phenomenon, that is, the "particular" on which the "formal analysis" is carried out. The form is the generalization for diverse contents. I am relying on the musical term "contrapuntal" in a variety of ways. Contrapuntal is defined as "the nature of counterpoint" (Oxford English Dictionary), and counterpoint is defined as the "opposite point" (OED). Musical examples predominate in the examples for these terms provided in the OED. For instance, the example cited for counterpoint is "the song or music pointed against... (by the) plain song indicated by the notes or points of the original melody (OED)." Or T.S. Eliot's reliance on the term contrapuntal in his *Music of Poetry*: "... there are possibilities for verse which bear some *analogy* [my italics] to the development of a

theme by different groups of instruments... there are possibilities of contrapuntal arrangement of subject matter" (quoted in the OED).

Gunther Schuller has written a scholarly book entitled *The Swing Era*, which is valuable because it contains a glossary of musical terms that exemplify "simultaneity" in the orchestration analogy. For instance, swing swings because of rhythms, and Schuller defines a *polyrhythm* as "the use of three or more rhythms simultaneously in different parts"(Schuller, 1989, p. 866). Similarly, polyphony "can be applied to the simultaneous use of several melodies or contrapuntal lines" (p. 866).

In everyday life, some would assume that simultaneity is more likely to occur within the "here and now" of horizontal events, rather than in the "then and there" of events organized vertically. But in music, Schuller states that horizontal relationships refer to " the melodic, or linear, aspects of a musical structure as differentiated from the harmonic, or chordal. Relationships are notated and read horizontally, i.e. across the page from left to right, in musical notation"(Schuller, 1989, p. 864). In contrast, vertical relationships in music are defined as "relationships notated and read vertically, i.e., up and down the page, in musical notation. Also, in the rhythmic aspects of a musical structure, a rhythmic simultaneity, i.e. a chord, will appear vertically aligned in musical notation, whereas non-simultaneous rhythmic elements will appear vertically unaligned" (p. 868).

In my quotations of Werner, I have noted the importance of *intra-individual variability* as integral to his coexistence concept of development. The orchestra analogy facilitates references to the "consistency" of a musical performance through an individual musician's style, but also refers to "variations" in the quality of a musical performance by a particular musician playing the same or different pieces of music. The evaluation of Gene Krupa, a drummer for Benny Goodman, by Schuller is illustrative of such an antithesis. The specific occasion was the historical inaugural of swing as sufficiently important to American culture to warrant an appearance at Carnegie Hall in 1938. Goodman's orchestra featured Krupa in "Sing, Sing, Sing." Schuller evaluates Krupa as follows: "... one is hard put to also explain Krupa's often deplorable monotonous drumming.... or the horrors of "Sing, Sing, Sing," or the countless other examples of Krupa's rigidly relentless pounding..." (p. 29). Parenthetically, I have to note that I disagree completely with Schuller, who also characterizes Krupa's playing as vulgar. But then Schuller also evaluates Krupa's drumming in very laudatory ways, to wit, "Throughout this performance (of "Swingtime in the Rockies") Krupa displays consummate dynamic control, and through his dynamics helps to delineate perfectly the form and structure of Mundy's fine arrangement" (p. 29).

Antithetical evaluations of the same person by another individual are common. Indeed, so are antithetical self-evaluations. In the former, the mutuality of infatuation and derogation can lead to marriage and divorce, just as in the latter, the roller coaster of self-evaluations in mania and depression can also be noted in how "normal" people feel about themselves in the course of a single day.

SEQUENCE AS AN IMPORTANT PRINCIPLE IN PSYCHOLOGY

Sequence as a principle has played an important role in psychological frameworks and attempts to construct order. Stages, phases, steps in developmental psychology, all rely on sequence for generating order in cognitive development. Controversies abound over the rate of development and the consistency or variability of the sequence utilized by a particular developmental theory. But sequence is an invariant criterion as a guideline for creating order. It is rare to be able to cite a consensually validated criterion in psychology, but there is one criterion that psychologists rely on when they utilize psychophysical methods: sequence. Thus, in the psychophysical measurement of perception, a researcher is required to "control" for sequence. Sequence as an abstraction may be a heuristic link between cognition and perception. Currently, for instance, Werner and Piaget each have two theories, one for the genesis of thought as interiorized action and the other for perceptual activities.

SIMULTANEITY AS AN IMPORTANT PRINCIPLE IN PSYCHOLOGY

Simultaneity as a principle is less evident in psychological theories. Even when it does appear, the label for the concept is not clearly labeled as simultaneity. So, simultaneity, I will argue, may be referred to as synchrony or as coexistence in diverse disciplines. Other terms that can be interpreted as representations of this idea include "spontaneous intuitions" (Myers, 2002, p. 4); the immediacies of "aha" experiences of insight discussed by psychologists from the Berlin Gestalt group; and "saliency" and "vividness," both in perception and in experiences that "transform" a person's life. A major transformation may be experienced as a conversion, such transformations may be a "discontinuity" in life or be brought about by what Gladwell (2002) has titled a "tipping point," or "how little things can make a big difference."

In contrast to the references in psychology, simultaneity and synchrony are frequently acknowledged in music. In the following examples I have relied heavily on musicians who "hear" and write about the music that I enjoy listening to, music that I enjoy but that I can only refer to through vague phrases like "Benny Goodman is fabulous!" or "I like Mozart!" Bernstein explains Mozart's G-minor symphony through three distinct forms of representation: a linguistic narrative, a corresponding musical notation, and the music itself that can be heard on CDs. Bernstein states that this symphony demonstrates "... that classical balance we were talking about—chromatic wandering on top but firmly supported by the inverted tonic-dominant. Do you see now what I mean by the structure underneath. Do you see now what I mean by the beauty of ambiguity? *It's the combination of those two contradictory forces, chromaticism and diatonicism, operating at the same time* [italics added], that makes this passage so expressive" (Bernstein, 1973, p. 43).

The contrapuntal themes discussed above can also be interpreted as manifesting itself through the antitheses within the Wernerian concept of development. Global, undifferentiated forms of organization, "vital" and valued positively, are, on the one hand, the source of all forms of genesis (onto/phylo/micro -genesis). On the other hand, differentiation can be valued negatively as a "specialization" that hinders further development. The latter differentiations, however, are the antithesis of the sequence and forms of organization that are posited as constituting development in Werner's orthogenetic principle. Analogically, the forms of organization in a coexistence concept of development are antithetical to the forms of organization posited by the orthogenetic principle of development, as is the idea of simultaneity in the former to the idea of sequence in the latter.

In thinking about integration through the orchestration analogue, Werner was possibly speaking not only as a psychologist, but was relying on his ***Anlage*** as a musician. Perhaps others may find it worthwhile to articulate this suggestion by Werner.

REFERENCES

Bernstein, L. (1973). *The unanswered question: Six talks at Harvard.* Cambridge, MA: Harvard University Press.

Bibace, R., (1956). The cognition of magnitude: A comparative study of normals and schizophrenics. Doctoral dissertation, Clark University.

Bibace, R. (1999). A partnership ideal. In R., Bibace, J.J. Dillon, B. Dowds (Eds.) *Partnerships in research, clinical and educational settings.* Norwood, NJ: Ablex Publishing Co.

Bibace, R., Dillon, J.J., & Saragin, J. (1999). Toward coexistence concept of casual reasoning about illness in children and adults. In R. Bibace, J.J. Dillon, B. Dowds (Eds.), *Partnerships in research, clinical and educational settings.* Norwood, NJ: Ablex Publishing Co.

Bibace, R., & Leeman, R. (1999). Some psychological processes involved in managing pediatric asthma. In R. Bibace, J.J. Dillon, B. Dowds (Eds.), *Partnerships in research, clinical and educational settings.* Norwood, NJ: Ablex Publishing Co.

Bibace, R., Marcus, D., Thomason, D., & Litt, E.A. (1987). Teaching psychological defenses: An interactive computerized program. *Teaching of Psychology, 14*(1).

Bibace, R., Sagarin, J.D., & Dyl, J. (1998). The heuristic value of Werner's coexistence concept of development. *Journal of Applied Developmental Psychology, 19,* 153–163.

Bibace, R., Schmidt, L., & Walsh, M.E. (1994). Children's perceptions of illness. In M. Herbert (Ed.), *Health psychology: A life span perspective.* Harwood Publishing.

Bibace, R. & Walsh, M.E. (1981). Children's conceptions of illness. In R. Bibace & M.E. Walsh (Eds.), *Children's conceptions of health, illness, and bodily functions* [Vol. 14 of *New directions for child development*]. San Francisco: Jossey-Bass.

Bibace, R., Wiehe, K., & Leeman, R. (2001). Children's understanding of biology and health. *Applied Developmental Psychology, 22,* 543–551.

Foucault, M. (1970). *The order of things: An archaeology of the human sciences.* New York: Random House.

Gladwell, M. (2002). *The tipping point: How little things can make a big difference.* Boston: Little, Brown & Co.

Leeman, R.F., & Bibace, R. The utility of a coexistence concept of development and psychological distancing acts in interpreting adults' beliefs in visual emissions. (Submitted for publication)

Myers, D.G. (2002). *Intuition: Its powers and perils.* New Haven, CT: Yale University Press.

Rapaport, D. (1941). Review of H. Werner 'Comparative psychology of mental development,' *Journal of Genetic Psychology*, 58–59, 429–434).

Schuller, G. (1989). *The swing era: The development of jazz*. New York: Oxford University Press.

Werner. H. (1934). Unity of the senses. In S.S. Barten & M.B. Franklin (Eds.) (1978), *Developmental processes: Heinz Werner's selected writings* (p. 153). New York: International Universities Press.

Werner, H. (1948). *Comparative Psychology of Mental Development* (rev. ed.). Chicago: Follet.

Werner, H. (1957). The concept of development from a comparative and organismic point of view. In D.B. Harris (Ed.), *The concept of development: An issues in the study of human behavior* (pp. 125–148). University of Minnesota Press.

Part IV

Transforming Werner's Heritage

15

THE THEORY OF PHENOMENAL PSYCHOLOGY

Louis Carini

The theory of phenomenal psychology consists of three axioms to account for the qualities of our visual percepts. The predictions from its three axioms are confirmed by the findings for twenty-one classes of objectively measured qualities of visual percepts from a variety of visual perception laboratories in the United States. The perceptual qualities are selected from, and are based upon, the unmeasured everyday phenomenological human experiences we adult human beings undergo. Those phenomenological perceptual qualities, however, once they have been measured under laboratory conditions, become objectively measured phenomenal percepts. Thus the data are those found in the results of the laboratories of experts in visual perception, but they derive from the unmeasurable everyday phenomenological experiences of our visual worlds. As many aspects of the qualities of the percepts that are derived from our everyday phenomenological experiencings as possible have been singled out for measurement through a variety of experimental procedures. Since, however, they have been measured in those objective ways they become the scientifically devised phenomena for which the theory of phenomenal psychology gives an axiomatic explanatory account. Thus the phenomenal data are as objective as the data of physics, and the axioms of the theory also follow that model.

Max Wertheimer's Gestalt psychology of a direct relation between brain processes and the qualities within percepts is the grandfather of this theory. The fathers are several: first, is Heinz Werner because of his acceptance of that direct relation between brain processes and percepts that Wertheimer demonstrated. This led Werner to the conclusion that the so-called illusory perceptual "facts are not illusions, but phenomena that illuminate the general structure of perception" (1978,

p. 154). That also means that percepts are not cognitions. But it is also because Werner's insistence upon specifying brain processes more precisely beyond the visual cortex by emphasizing the tonus of the cerebral cortex, and the reciprocities between sensory and motor factors carried him well beyond the Gestalt theorizing. A second father is Kurt Koffka for his principle of *appurtenance* that he expanded from motions to colors. A further father and mother are Ernst Cassirer because of his philosophy of symbolic forms, and Susanne Langer due to her proposal of symbolic transformations. Heinz Werner once again has to be considered in a second fathering role here because of his understanding in that perceptual constancy functions can be subordinated to "conceptual operations... as factors of control and replace partly the... perceptual apprehension of the world" during development (1946, p. 227). And finally, not a father, but more a brother, Walter C. Gogel is included because of his extensive and innovative experimental work on visual perception without which this theory could not have been devised, and also for his principle of perceptual adjacency.

The three axioms provide a hypothetico-deductive theory which, because they account for twenty-one classes of measured visual percepts, by extension these same axioms can be considered as giving an account of our everyday phenomenological experiences which cannot be measured in a laboratory. This means that it is a scientific phenomenal theory about phenomenological experiences which also means to account for human actions. Human actions arise out of the qualities we perceive. In accounting for those qualities the theory also explains the actions we take on the bases of what we perceive that are then explained by the three axioms of the theory. We act as we do, the theory suggests, because of the ways that we *symbolically conceptualize* in a *meaningful* way what *pertains* or *matters* to us based upon our genetically given level of *cortical tonic expressivity.*

Koffka (1935) employed the concept of *appurtenance* to account for the fact that in a darkroom a black disk outlined exactly by a hidden light appeared white, but once a smaller white rectangle of paper was placed upon the black disk, the disk immediately appeared black due to its contrast with the white bit of paper. Appurtenance means something that pertains to, or that belongs to something else as a part of a system, to a whole, larger system. Thus the white rectangle of paper, as a part now of the larger system, made the white appearing disk revert to black. This theory proposes *appurtenance* as one of the three major factors to account for the characteristics of our perceptual worlds.

Appurtanance means, according to dictionaries, not only belonging to something, but as I indicated, pertaining to something in such a way as to form a new system. Another meaning of *appurtenance* is the sense of appropriateness—both in the sense of being fashioned in a suitable way, but also as that which appropriates, which takes over and persists. Examining the so-called Gestalt "laws" of organization in the light of this definition of appurtenance, makes it clear that all of its "laws" or concepts are covered by appurtenance. When more than one figure is present (see Figure 1), then they pertain systematically on the basis of proximity, similarity, and good continuation; they are appropriated and brought into a unified

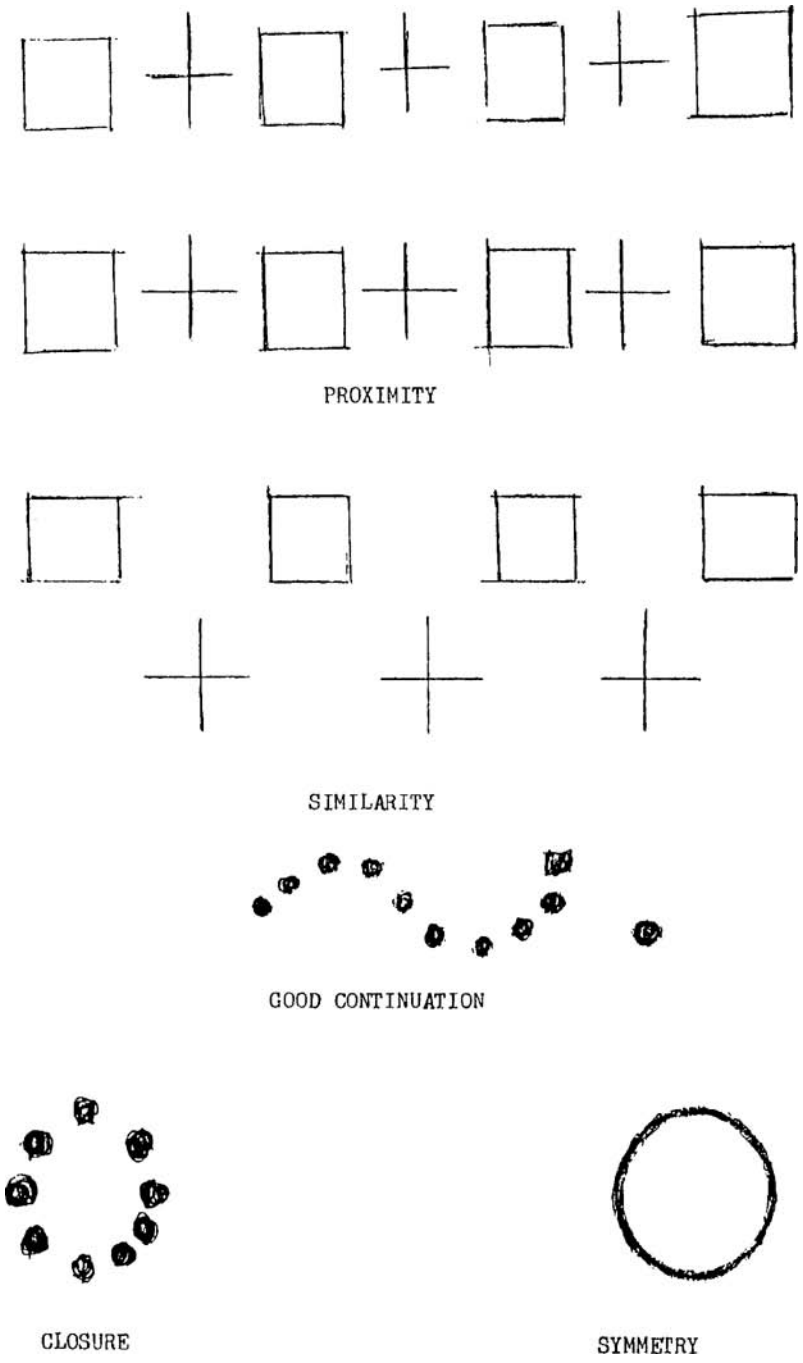


Figure 1. Laws of organization.

Figure 2. Stimuli used in the study.

group by how they pertain there. When, however, it is a single figure made up of parts or in relation to its inner structure, they pertain on the basis of symmetry (or simplicity), closure and pregnanz. Appurtenance is the general axiom, then, that encompasses all of the so-called Gestalt "laws" of visual perception. Those "laws" now come under the law, or better, the Axiom of Appurtenance.

The second axiom proposes a symbolic factor as operating upon our visual percepts. Sensory stimuli, the axiom proposes, are transformed by a symbolic meaningful conceptualization process which transforms the physical-physiological stimulation into the qualities of the visual percepts we experience. I used Figure 2 (Carini, 1984) in this way to demonstrate the transformation of physical-physiological stimuli by symbolic words: After giving 12 observers 12 seconds to describe the figures to themselves, I asked: "Do you see the triangle in the center?" At that moment, and not before, 11 of the 12 ($p < .01$, binomial test) reported that they saw a triangle there, and were able to outline it with an index finger. The word-symbol "triangle" provided the observers with a cognitive set to see a triangle, and the word-symbol "center" brought the attention of each of the observers to the center of the three figures. The symbolic process consisted in a transformation of the bare physical presentation without a triangle, on a physiological retina also devoid of a triangle, to the visual perception of a triangle. The symbolic meaningful conceptualization stands for and thus re-presents, or presents the physical-physiological stimulation again, but now conceived as a triangle seen phenomenally under the controlled conditions of a laboratory. The symbolic meaningful conceptualization resides in us as an idea or concept which controlled the cognitive set to see a triangle. Here Werner's "conceptual operations" clearly do, indeed, "replace ... perceptual

apprehension of the world." The observations demonstrate the power of a symbolic conception to act directly upon a percept.

The old notion of cognitive sets that has played such a prominent extra theoretical role for over a century in psychological explanations, has been here encompassed as part of a psychological theory. It is the Axiom of Symbolic Meaningful Conceptualizations which controls cognitive sets and our ability to shift our attention from one item to another—both inner and outer and inner to outer as well as vice versa. Consciousness itself is what has to be involved in all of the operations which involve attention. I define consciousness as a reflective awareness which always involves more than one percept itself. Consciousness consists of an awareness of any other awareness. It is consciousness that is involved when we look at one thing but think of another. And it is consciousness so defined that is the basis of our human thought processes. It is also the consciousness arising from this Axiom of Symbolic Meaningful Conceptualizations which provides the power to overcome their damaged physical-physiological bases to give a new phenomenal psychological macula which replaces the physiological macula when the visual field is halved because of a brain damage to the visual cortices.

The third factor involves what in the monograph ***The Theory of Symbolic Transformations*** (Carini, 1969), I called the "physiological stimulation." In that earliest presentation of the theory the physiological stimulation was delineated abstractly in order to outline the extremities of the postulate system espoused there. It may suffice to say here that the characteristics of an after-image, depending as they do on a retinal rather than a centrally located cortical process, is an instance of a reduction in or an absence of cortical activity. That was a central concern of the theory as I proposed it then. In this exposition of the theory it is the power of the expressivity of cortical activity to maintain the stability of our perceptual worlds that is at issue. It is also the reciprocal relations between the *expressivities* of cortical functioning, both internally and externally expressed, and internally and externally elicited, whether motorically or perceptually, that is the issue now. My second theoretical attempt, *Three Axioms for a Theory of Conduct* (Carini, 1984), did try to move in that direction through the use of an axiom which generalized Werner & Wapner's (1952) sensory-tonic field theory of perception. I generalized the entire components of their theory as a third axiom in my own 1984 version of the theory. I should note that the data that they and their colleagues accumulated have been indispensable to the formulation of both this phenomenal theory of perception and the earlier *Three Axiom* one.

Sensory-tonic refers to a physiological state of the organism which suggests a tonic readiness in the brain that meets every incoming stimulus—whether internal or external. For example, an active sensory-tonic state, such as waving the arms while looking at a dot of light in a darkroom, provides less autokinetic motion perceived than does a state of immobilization (Werner & Wapner, 1952). Sensory-tonic states then bespeak a reciprocity between percepts and the state of the organism *vis-a-vis* the incoming stimulus rather than a simple stimulus and response effect. With changes in tonicity as well as in sensorial stimulation, whether over time, or

with repeated events, percepts change in a reciprocal fashion. I have generalized the events that Werner & Wapner variously called: functional equivalence, vicariousness, and perceptual dynamics into a single and simple concept of reciprocity. I am suggesting that all of the above terms refer to *reciprocal* events. Though I used the sensory-tonic concept in that reciprocal way in my presentation of the theory in my *Three Axioms* in 1984, I now find difficulties with that aspect of my theory.

One difficulty was with what they called *perceptual dynamics*. Since those often involve cognitive factors, as was pointed out by Glick (1968), they indicate a function whose outcomes lie well beyond merely sensory *or* tonic ones. Many of them are cognitive in their emphases, and while it is true that these cognitive emphases have effects upon perception or upon bodily activity which are reciprocal in nature, they are better separated from the sensory-tonic proposal, and made part of the Axiom of Symbolic Meaningful Conceptualizations of which they clearly are an outcome. That change will be dealt with here and also later.

The sensory-tonic term and concept fails properly to represent the central involvement of the cortical activity itself. What is central is the tonic outcome of the intact and active cerebral cortex which culminates in the expression of either perceptual or of motor events. I believe that Werner feared the reaction to a sensory-motor theory sparked by tonic cortical activity, because the phrase "sensory-motor" had an old and negative connotation in the field. But the sensory and the motoric are reciprocal to one another not only in fact, but also in the brain, and Werner made that very clear in an article in 1945. He wrote there

> A common dynamic property binds both sensory and motor processes. This common factor is, most probably, tonicity. Normal and pathological evidence favors the theory that perceptual space—of which visual motion is a special form—is organized, not as a purely sensory area, but as a sensory-tonic field. (Werner, 1978, p. 189):

But he should have concluded from what he said in the first sentence "as a sensory-tonic [motoric] field." He misspoke himself, and I intend to correct that in the new third axiom of the current theory.

The somato-sensory cortex lies directly behind a fissure separating the parietal lobes from the frontal lobes. The motor cortex lies on the other side at the posterior portion of the frontal lobes. We appear to be constituted in such a fashion that our somatasensory and the motor aspects of our experiencing and action lie along a line which ensures their reciprocity in human functioning. The tonic state of the organism is more central, and central to the motoric as much as the sensory, both of which facts are overlooked by the term "sensory-tonic."

Furthermore, the phrase "sensory-tonic" fails to indicate the unity that is the case for what have to be cortically determined reciprocal motoric *and* sensory outcomes. Werner & Wapner provide many examples of these from their own research and from the literature. Perhaps the most striking one of the aptness of Werner's (1978) basic ideas in 1945 was further buttressed by data in the literature since 1962 (Werner died in 1964) which demonstrated the reciprocity between sensory

and motoric outcomes in apparent motion. Ordinarily apparent motion occurs in the laboratory when two lights or lines a small space apart follow one another in time—just as motion pictures also do provide apparent motion from still images. Rock & Ebenholtz (1962) demonstrated that when the head was moved, but the retinal presentation was upon the exact same spot, it was *movement* of the light that was *perceived.* What this means is that apparent motion arises from the *same* retinal impression so long as it occurs in conjunction with the physical motion of the head, just as it does when two disparate retinal impressions on the immobile head provide perceived motion. The head movement with the same retinal impression or the disparate retinal impressions in the proper time-distance sequence both give rise to the *same apparent* motion. Werner's notion of the reciprocity of the sensory and motoric functions was strikingly confirmed by these data.

But perhaps most important here, the concept of tonus as it is presented in the theory fails to indicate how powerful an effect the tonicity arising from the cerebral cortex can have—or fail to have—especially under somewhat abnormal conditions. Werner & Thuma (1942), for example, demonstrate that certain brain damaged boys fail to see apparent motion when it is present in normal boys of the same age. Apparent motion, I now suggest, is an expressive outcome of two single stimuli *integrated* into one smooth motion by the pure activity of the intact human cerebral cortex. Normal boys, and all the rest of us, integrate these discrete stimuli into an expressive movement in perception. One might consider that tonic activity of the cerebral cortex is unable to have its proper expressive outcome with brain damage.

But there is an even more compelling reason for broadening the idea of the cerebral cortical tonicity from its use in their sensory-tonic theory. Bexton, Heron, & Scott (1954) and Heron, Doane, & Scott (1956) conducted sensory deprivation studies with college students. When the translucent goggles they had worn over their eyes for six days were removed, their visual percepts were so awry that some of them became ill. The world had no stability. Objects focused upon hurtled toward them or abruptly receded; the walls waved about like cloth draperies in a breeze; the colors of everything were too intense; perceptual constancy was completely gone. Indeed, in the latter study the three experimenters reported that they no longer saw any parallel lines in their environs—tables, windows, doors—were all curved. The retina of the eye is curved. How is it that we ordinarily do see parallel lines? The cognitive doctrine, by the way, is once again brought into question by these facts.

Their thoughts too were chaotic and incoherent. The normal activity of the intact brain appeared to have become unhinged. Symbolic activity—such as adding simple numbers—was awry as well as the stable relations among objects that Appurtenance ordinarily maintains. The normal expressive activity of the brain had been interfered with and none of the usual perceptual functions remained. The normal Cortical activity providing the proper level of Tonus to the brain must have been awry, but the brain had to go on functioning anyway. And the awry perceptual outcomes reflected that disturbance. The subjects in the experiment continued

to see, think and act, but total instability reigned in their visual perceptual field, in their thought processes, and their actions.

I believe that the cerebral cortex had to go on functioning, but without its usual input from the *figured patterns* of our worlds everything was awry. The basic activity of the cerebral cortex which maintains its tonus continued, but the expressivities that resulted were abnormal. As I see it, the basic factor underlying all perceptual and motor stability, as well as Appurtenance and our Symbolic ways of Conceptualizing things, depend upon the Cerebral Cortex receiving its *proper stimulation* so that its natural Tonicity can direct its expressiveness appropriately. I have accordingly decided that what I am calling *Cortical Tonic Expressivity* should be the third axiom of the new phenomenal theory of perception.

The phrase "Cortical Tonic Expressivity" can substitute for the full statement which would need all of the following words: "the expressivity arising from the intact cerebral cortex which provides for the normal tonic activity of the brain." Developmentally, I assume that Cortical Tonic Expressivity, arising well before birth, first brings with it in infancy direct Appurtenant relationships which are followed within the first year by Symbolic ways of Conceptualizing events Meaningfully. The last transforms our Appurtenant sensory worlds into what we see. It is changes in these three factors with age which are reflected in known changes in perceptual development. It should be possible to test the validity of the above statement which follows from the general theory by appropriate developmental studies of visual perception. To present those already in the literature is not possible here, though a few were documented previously (Carini, 1969).

The factors of Appurtenance, Symbolic Meaningful Conceptualizations, and Cortical Tonic Expressivity are postulated axiomatically to account for all the qualitative phenomena of visual perception. By extension these three axioms are also meant to account for all of the rest of our sensory phenomena; hearing, taste, smell and touch. Evidence for olfactory perception and auditory perception as following Symbolic Meaningful Conceptualizations is presented in ***Explanations of percepts and concepts in schizophrenia*** (Carini, 1973). And then, these axioms are also assumed to provide the bases for why we human beings act as we do, just as they do in accounting for the behaviors which indicate the qualities of the percepts that the observers in the following experiments undertook. These "intrinsic" (Kuhn, 1970) actions taken by the observers in the experiments below are generalized to our "extrinsic" everyday actions. In assuming this I merely assume what physicists have been assuming for centuries about their ability to explain the fall of leaves on a breezy autumn day. These axioms, however, do not account for animal actions.

THREE AXIOMS

I. If two or more external stimuli are present (ES > l), the qualia of the percepts (QPs) will be determined by the Axiom of Appurtenance. (ES > 1, QPs = A)

II. If no external stimulation is present (ES = 0), the quality of the percept (QP) will equal the person's Symbolic Meaningful Conceptualization for the thing. (ES = 0, QP = SMC)
III. If no Symbolic Meaningful Conceptualization (SMC = 0) is present, the quality of the percept (QP) will equal the person's level of Cortical Tonic Expressivity. (SMC = 0, QP = CTE)

These axioms express idealized, and, indeed, even counterfactual propositions. Furthermore, they operate conjointly unless, as has been done below, they have been isolated by particular experimental procedures to demonstrate the operation of each of them separately. I believe that it is useful to state the axioms individually and in idealized terms so that their assessment empirically can be unambiguous. What is required is that each axiom must now be operationally defined so that theorems can be deduced from them. The operationally defined theorems then embody specific hypotheses that are then checked against data in the empirical literature.

Twenty-one theorems as empirical hypotheses follow as deductions from the three axioms. The theorems are not meant to be exhaustive either of the literature, or of the potential number of theorems that could be deduced, for the number is without end. They are meant to represent, each one, the class of experimental findings to which that axiom provides an explanation. The theorems provide operational definitions of the several axioms. I am presenting here only those instances where the effect of each of the axioms is reasonably clear cut so that each can be evaluated separately and thus unambiguously. I assume that in most cases in daily life the qualities of our percepts are determined by a mixture of at least two—probably all three of the axioms. The literature not referred to here, I am assuming, also to be a function of all three axioms acting in concert—except where the literature deals with meaningless percepts. The potency of the operation of these Axioms beyond those referred to in specific experiments here and in everyday life can be inferred from how well they are bourne out here by the data from a variety of laboratories in the United States.

The three axioms are meant to compose a formal system, but only axioms II and III have been defined mathematically as upon a continuum from 1 to 0 and from 0 to 1. I do not believe that further mathematization would serve a useful purpose, and merely propose those above to indicate the limits of the axiomatic proposal. Walter C. Gogel (1984) has attempted to mathematize some of the findings on his principle of perceptual adjacency. I see his principle of perceptual adjacency as an empirical condition operating under the Axiom of Appurtenance. I do not believe that Gogel's limited success toward mathematization warrants the expectation that the larger expanse to which Appurtenance applies, in comparison with what his principle of perceptual adjacency refers, will be fulfilled by successful attempts at mathematization. Confirmation of the predictions made from the formal system will provide evidence for the validity of the system as a whole as well as for its specific axioms. Failure of the predictions would, of course, constitute refutation of either parts or of the whole theory.

THEOREMS ABOUT MOVEMENT

Axiom I., Theorem 1

Apparent motion of a vertically moving red light between two horizontally moving blue lights constitute a situation that calls for the operation of the Axiom of Appurtenance. The prediction from the theorem is that the physically vertical motion of the red light will become a perceived diagonal motion when the three lights pertain to one another.

Gogel & Tietz (1976) conducted an experiment where they could stereoscopically place the vertically moving single red light at the same distance as the blue lights or as at a different distance from the blue lights. When the red and the blue lights were all at the same distance, and thus pertained to one another, the red light assumed a perceptually diagonal path. When, however, the red light was subjected to two sets of blue lights, one set near and one far, moving in opposite directions, the angle of the movement of the red light was more affected by the blue lights to which it was perceptually adjacent, and therefore to which it pertained—whether those lights were near or far. The results demonstrate the power of both perceptual adjacency and the operational power of the Axiom of Appurtenance. Here the differentiation of the two theoretical proposals have the same outcome. However, though both have been here confirmed the greater generality of the Axiom of Appurtennce will become clear below. (ES > 1, QPs = A) Q. E. D.

Axiom II., Theorem 2

Providing the observers with a Symbolic Meaningful Conceptulization through instructions to *attend* to one aspect of a situation rather than another involves Axiom II. When the specific instructions are to attend "mentally" to one aspect while remaining physiologically focused on another aspect, a theorem from the Axiom can be tested. To attend "mentally" means that a Symbolic Meaningful Conceptualization is involved. And the power of the axiom to control consciousness, and, indeed, the power of *consciousness* itself over our physiology would also be tested and measured. Though the axiom proposes no physiological stimulation being present, which is an empirical impossibility, the fact that the experiment is carried out in darkness means that the physiological stimulation clearly has been reduced—though not eradicated.

In another part of the Gogel & Tietz experiment above the observers were instructed to *attend* to one pair of inducing blue lights, say the far ones. The red light was at a distance midway between the two sets of blue lights, and thus was moving vertically, because neither set of blue lights were perceptually adjacent to it. Even as they physiologically fixated the red light at a distance between the two sets of blue lights, they were instructed to pay attention in one instance to the faraway blue lights and in another to the nearby blue lights. The effect of the act of so attending was to displace the apparent motion of the physiologically focussed red light by a twenty degree angle from the vertical with the attention on the faraway blue lights

to a twenty-five degree angular motion from the vertical for attention to the nearby blue lights. The mere Symbolic Meaningful Conceptualization undertaken by the observers to pay attention to the red light strongly affects the apparent motion perceived.

Furthermore, this measurement resulting from attending is also a measurement of the effect of *consciousness*. I define consciousness as a reflective attention, as a reflection upon what one is attending to, or holding in one's reflective awareness. This definition indicates that consciousness so defined has been given an empirical measure of its effect upon a physiological focus. The physiological focus is overcome, and approximately one-half of the usual power of *non*Appurtenance is engendered merely by the Symbolic Meaningful Conceptualization. Axiom II is also confirmed by the evidence. (ES = 0, QP = SMC) Q. E. D.

Axiom III., Theorem 3

The axiom of Cortical Tonic Expressivity proposes a reciprocity of motoric and perceptual expressivities expecially when Symbolic Meaningful Conceptualizations are not present. Restriction of motor activity should result in increased perceptual expressiveness when nothing symbolic is present, since motor expression has been inhibited.

Warm, Wait, & Loeb (1976) demonstrated that head restraint enhanced the observers' ability to detect small meaning*less* movements in their visual fields that were unable to be seen ordinarily. No Symbolized kind of Conceptualization was present in the *meaningless* small movements, which fulfills that part of the meaning of the axiom, and the movements were enhanced by the operation of the Expressivity inherent in the Tonicity of the cerebral Cortex under those circumstances. (SMC = 0, QP = CTE) Q. E. D.

THEOREMS ABOUT SIZE AND DISTANCE

Axiom II., Theorem 4

The perception of the size of a bridge card presented in isolation will equal the observers' Symbolic Meaningful Conceptualization of a bridge card.

I had (Carini, 1969) observers, whose left eye was covered by an eyepatch, draw from memory a bridge card so that if a card had been present it would have fit exactly into the outline drawn. Since the card was drawn entirely from memory it would be each observer's Symbolic Meaningful Conceptualization of the card. The observers were then led into a darkroom where they sat facing a window upon which a piece of acetate was attached. They were each asked to trace a playing card placed behind the glass starting at the top in this darkroom which substituted for *no external stimulation*. (A dimly lit dot was at the end of the marker to enable them to see it so that they could trace it.) The sizes of the two tracings were correlated at a statistically significant level with the drawing from memory. The correlation was .94

for six observers who did not wear glasses. Though the correlation does not exactly equalize the two determinations—the one from seeing and the one from memory—it is sufficient to provide evidence for the theorem, and in turn for the Axiom of Symbolic Meaningful Conceptualizations. (ES = 0, QP = SMC) Q. E. D.

Axiom I., Theorem 5

A playing card perceived to be at a different distance than the dimly lit back wall will *pertain* to that wall—the Axiom of Appurtenance and the perception of the distance to the card will be drawn into its vicinity.

In a first part of the experiment Gogel (1969) determined that a playing card in isolation and physically at 5 ft. away from the observer was perceived on the average as at 5.5 ft. with a standard deviation of 4.4 ft. While the card remained at the same distance Gogel allowed a dim light to disclose the back wall 16.7 ft. away. The determinations of the distance of the perception of the card under these conditions was 12.1 ft. away! The no longer isolated playing card pertained to the distance of the back wall, and that moved the mean perceived distance 6.6 ft. from its peviously perceived distance. Once again Gogel's principle of perceptual adjacency and Axiom I are both confirmed by the evidence. This is also not a situation which allows one to choose between the two theories. Still the confirmation of the Axiom of Appurtenance is confirmed. (ES > 1, QPs = A) Q. E. D.

Axiom III., Theorem 6

Cortical Tonic Expressivity is proposed to be reciprocal to the size-distance relations perceived under the force of acceleration of linear velocity when no Symbolic Meaningful Conceptualization is present.

Linear velocity arising from acceleration from 0 to 60 miles an hour in 10 secs. requires no Symbolic Meaningful Conceptualization of the size of a stimulus which was merely a circle of light. The circle of light appeared larger (or nearer) under acceleration and smaller (or farther away) under deceleration (Goldstein,1959). Cortical Tonic Expressivity engaged without a Symbolic Meaningful Conceptulization resulted in predictable perceptual changes. Axiom III is thus confirmed once again. (SMC = 0, QP = CTE) Q. E. D.

THEOREMS ABOUT COLOR AND/OR BRIGHTNESS

Axiom I., Theorem 7

When the context surrounding a disk changes greatly in intensity so that a new systematic relationship *pertains* between an orange (pink) disk and its extremely bright surround, then the colors perceived are brown (magenta).

Wallach (1963) increased the intensity surrounding in one instance an orange disk and in the other a pink one. When the surrounding intensity was at its height the orange disk was perceived as brown and the pink one was perceived as a magenta color. The colors were determined by the surround to which they pertained. Gogel has not considered this finding as a function of his principle of perceptual adjacency, but it does so, and once again his principle and the Axiom cannot be differentiated. However, the Axiom of Appurtenance is also confirmed in the area of color. (ES > 1, QPs = A) Q. E. D.

Axiom II., Theorem 8

The color of an object that has one known color will be perceived according to the way it has been Symbolically Conceptualized as Meaning that color. An object that is always red (yellow) will influence the perception of a neutral color under conditions of a dimly lit room (CTE = 0).

Bruner, Postman & Rodriques (1951), Delk & Fillenbaum (1965), and Ridley (1987) all conducted experiments along the lines of the effects of shapes and/or words on the perception of colors. The findings are that cutouts of objects in their appropriate shapes that are always red (yellow) such as a tomato (lemon) and are so named are perceived as much redder (yellower) than the neutral stimulus color. This occurs only in dim light, that is, only when the sensory input is low. What makes the proposal of an axiomatically Symbolic Meaningful Conceptulization especially pertinent here is that in Ridley's experiment the *color* that the observers recalled from *memory* did not differ significantly from the *perception* of the color of the tomato engendered merely by its shape and name in dim light. That result provides strong evidence for the effectiveness of the Axiom of Symbolic Meaningful Conceptualizations on the qualities of our visual percepts, since a memory image is of necessity only a Symbolic Meaningful Conceptualization. (CTE = 0, QPs = SMC) Q. E. D.

Axiom III., Theorem 9

The expressivity of the cerebral cortex (CTE) allows for changes in the perception of objects through figural adaptation. What this means is that any stimulus creates a situation where what is present becomes a new kind of norm. Asymmetrically presented colored squares provide such a situation. Cortical Tonic Expressivity will result in an outcome where the perception of asymmetry is lessened.

Wapner & Werner (1955) presented observers with two squares of red expanse side by side with an additional expanse of green. The perception of what was straight ahead for the observers was displaced in the direction of the predominant color. I suggest that the asymmetry disturbs the state of Cortical Tonic Expressivity so that the internal tonic state changes, because the motoric activity would be minimal. Here no Symbolic Meaningful Conceptualization is present in the

asymmetrical stimuli, so Cortical Expressivity provides a new stimulus-organism relationship. (SMC = 0, QPs = CTE) Q. E. D.

THEOREMS ABOUT SPATIAL ORIENTATIONS

Axiom I., Theorem 10

The orientation of a rod in space will be modified by the frame to which it pertains. When the rod pertains to the frame the illusion will occur, and when the rod does not pertain to the frame the illusion will disappear—the Axiom of Appurtenance.

Gogel & Newton (1975) provide evidence that when a rod is within a square frame that is tilted and surrounds it, and both are at the same perceived distance, the rod is displaced from its vertical axis. When the rod was stereoscopically perceived as in front of the frame, the illusion disappeared. The rod and the frame no longer pertain when the rod stands separately in front of the frame. Gogel's empirical condition of perceptual adjacency or nonadjacency was effective under those two conditions. However, when the frame was near and the observers had to *look through* the frame at the rod, the illusion reappeared despite the fact that the empirical condition of perceptual adjacency was enforced stereoscopically. I suggest that "looking through" the frame creates another empirical condition which countermands "perceptual adjacency" as an empirical condition, but lends itself to the operation of the Axiom of Appurtenance. The empirical condition of "looking through" countermands the empirical condition of "perceptual adjacency," but the Axiom of Appurtenance still predicts the correct result. Here perceptual adjacency has been directly opposed to Appurtenance, and the Axiom of Appurtenance demonstrates its greater generality. (ES > 1, QPs = A) Q. E. D.

Axiom II., Theorem 11

Each observer's perception of a rod as vertical will be a function of his Symbolic Meaningful Conceptualization of verticality as he (she) perceives it under darkroom conditions (CTE = 0).

Werner & Wapner (1952) provide no statistical evidence for such individual differences in persons' perception of verticality when sitting erect, but it is clear that had their measures been finer no two people experienced the vertical in exactly the same way. The Symbolic Conceptualization of what appears to be vertical out there for the person, though not statistically proven is confirmed by the fact that there is a spread among the perceived verticals even when the observers are sitting erect. Here Werner's earlier adherence to a phenomenal position is made evident. For according to cognitive psychology these small differences would have to be *errors* from a common cognitively correct vertical. But from a phenomenological point of view which Werner articulated above in relation to geometric "illusions," these

are not errors, but indications of individual differences in perceiving verticality. I believe that the Axiom of Symbolic Meaningful Conceptualization is confirmed by these data. (ES = 0, QP = SMC) Q. E. D.

Axiom III., Theorem 12

Adjusting a rod to the observer's tilted position requires no Symbolic Meaningful Conceptualization, or at least a *reduced* one compared to being asked to adjust a rod to objective vertical (SMC = 0). The result should accordingly be one in opposition to the E phenomenon which is a function of the increased conceptual ability in late adolescence.

Aubert's E phenomenon has been known since 1887. It is a consistent tendency to place a lighted rod in the dark in the direction opposite the body tilt. The fact that it does not appear until adolescence (Wapner & Werner, 1957) indicates that a Symbolic Conceptualization of the outside world may be involved which overcomes the strictly more strongly perceptual results found prior to adolescence. Since Cortical Tonic Expressivity is what operates in the absence of a strong Symbolic Conceptualization, then adjusting a rod to one's own tilted position should provide a result different from the presence of an E phenomenon. The results (Glick, 1968) indicate an A phenomenon—a placement of the rod not only in the same direction as the body tilt, but beyond the actual physical tilt of one's body. It appears that the disturbance of the body state unleashes a strong Expression of the Cortical Expressivity in a direction opposite the Symbolic Conceptualization, as the axiom suggests. (SMC = 0, QP = CTE) Q. E. D.

THEOREMS ABOUT THE ORGANIZATION OF FIGURES

Axiom I., Theorem 13

The status of a part of a figure will depend upon the nature of the whole figure to which it belongs (Appurtenance) rather than to one merely perceptally adjacent to it.

The white triangle cut out of the Benary cross (Figure 3) is predicted to be brighter than a triangle surrounded by the same amount of black, but merely perceptually adjacent to the cross. Belongingness or Appurtenance is confirmed by the evidence and strengthens the position theoretically of Axiom I. (ES > 1, QPs = A) Q. E. D.

Axiom II., Theorem 14

A Symbolic Conceptualization of a Meaningful (SMC = 1) figure provides a more differentiable percept than a figure not so symbolized (SMC = 0). A small

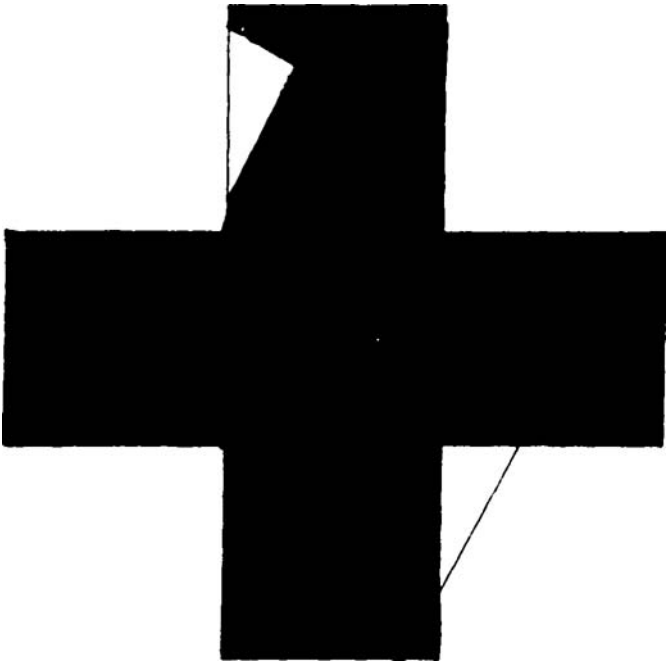


Figure 3. The Benary cross.

break at the bottom in each of the figures should be more apparent in the Symbolically organized one than the one not so organized.

Weitzman (1963) utilized a situation where the only distinguishing feature between two sides of a circle irregularly divided in half was a dot placed where an eye would be if the line were a person's profile. For half of the observers the dot was on the left side and for the other half—with no other change in the figure—the dot was on the right side of the figure. A fixation point on the dividing line required that they were physically focussed always in the same place. The two small breaks at the bottom of the figure were perceived significantly more often to the side where the eye-dot lay. The Symbolic Conceptalization of the figure as Meaning a person's profile led to increased visual acuity in their percepts. (CTE = 0, QP = SMC = 1) Q. E. D.

Axiom III., Theorem 15

Prolonged figural observation has an effect upon the level of Cortical Tonic Expressivity when no Symbolic Conceptualization is present, but since it has no outlet either in motoric or perceptual activity, no evident effect occurs until the

observers turn their attention to a new figure as in the figural after-effect. The presentation of a line for a period of time will effect a second line by displacing it from the first one due to Cortical Tonic Expressivity.

Köhler & Wallach's figural aftereffects (1944) provide considerable information about the changes wrought in a subsequent figure by the prior inspection of another figure. They explain all of their effects as due to satiation and electro-tonus—which they otherwise do not define. One result, however, militates against electro-tonus as an explanation of their data, for there are differences in the effect of prior observation of the line around the horizontal and the vertical compared to other orientations in space. What that means to me is that their data require explanations on something beyond pure electro-tonus. I suggest that the Symbolic Meaningful Conceptualizations of the horizontal and the vertical axes inhibits the free effect of Cortical Tonic Expressivity; where no such Symbolized Conceptualizations occur, then the true expression of Cortical Expressivity is the result. These results suggest that a pure satiation due to electro-tonus is not the explanation. Instead the clear opposition of a Symbolic Meaningful Conceptualization having a dampening effect upon the pure Expressivity of the Cerebral Cortical activity indicates the true nature of the opposition of these two factors as Axioms II and III maintain. In other situations I suggest that all of the adaptation effects of Gibson and the figural after-effects of Koehler and Wallach can be now seen to be a function of Cortical Tonic Expressivity alone. (SMC = 0. QP = CTE) Q. E. D.

THEOREMS ABOUT GEOMETRIC ILLUSIONS

Axiom I., Theorem 16

The perceived size of the forward crossbar in the Ponzo illusion will be modified by the angle to which it pertains—the Axiom of Appurtenance.

The Ponzo illusion has been demonstrated by Gogel (1975) to be a function of his perceptual adjacency when the angle and the parallel lines are at the same distance. When the parallel lines are stereoscopically displaced in front of the angle the illusion disappears as his theory of perceptual adjacency, here *non*adjacency, predicts. However, when the angle is in front of the parallel lines and the stereopsis enforces *non*adjacency, the illusion remains despite the enforced perceptual nonadjacency. I suggest once again that *looking through* the large angle to see the parallel lines nullifies the operation of perceptual nonadjacency. Futhermore, I again suggest that both "looking through" and "perceptual adjacency" (or "*non*adjacency") are empirical conditions which allow for the operation of the Axiom of Appurtenance. When *perceptual adjacency* is present, so too is Appurtenance; when perceptual nonadjacency is present, so too is non Apurtenance; but when "looking through" is present even when perceptual nonadjacecy is also present, then the theoretical operation of the Axiom of Appurtenance shows its power of generality over

any mere empirical condition as the explanation of perceptual phenomena. Axiom I has had a further confirmation in the evidence. (ES > 1, QP = A) Q. E. D.

Axiom II., Theorem 17

If no external stimulation exists (ES = 0), a Poggendorff illusion equal to a visual one will exist purely as a Symbolic Meaningful Conceptualization—that is, as an imagined line (SMC = 1).

Pressey & Wilson (1974) demonstrated that the magnitude of the effect of the imaginary line proposed as part of the Poggendorf illusiion was at least as great as the effect of the actual line. These results provide impressive evidence against any attempts, such as Walker (1973) made, to account for the Poggendorff—among other illusions—on a retinal basis. Furthermore, an imagined line is a line that exists merely as an image in the consciousness of each of the observers. Consciousness as a factor in perception as a result of a Symbolic Meaningful Conceptualization has once again proven its empirical power. Axiom II has once again been able to provide a correct prediction for a class of phenomena. (ES = 0, QP = SCM = 1) Q. E. D.

Axiom III., Theorem 18

If no Symbolic Meaningful Conceptualization is present (SMC = 0), then the continued observation of the Mueller-Lyer illusion will be reduced to its level of pure Cortical Tonic Expressivity.

Wertheimer (1958) demonstrated that repeating a word over and over again causes it to lose its *meaning*, that is, its quality as a Symbolic Meaningful Conceptualization is lost. Repeated exposures to the Mueller-Lyer illusion should reduce its *meaning* as an illusory figure, and become less illusory since being an illusion *is* its sole *meaning*. Köhler & Fishbach (1950) demonstated not only the loss of the presence of the Mueller-Lyer illusion, but in some cases it even turned into its opposite. Repetition induces a new Cortical Tonic state such that cortical Expressivity takes over and may even turn an illusion into its opposite. Axiom III has once more been confirmed by the evidence. (SMC = 0, QP = CTE) Q. E. D.

THEOREMS ABOUT SUBJECTIVE SURFACES

Axiom II., Theorem 19

Instructions to attend to some feature bring forth a Symbolic Meaningful Conceptualization (SMC = 1) on the part of each observer of an intention to attend to the feature upon which attention is to be focused. Cortical Tonic Expressivity has essentially no function here (CTE = 0).

Kennedy (1976) provides many examples of the power of attention alone, that is the power of consciousness in my terms, to bring forth subjective surfaces. Attending is only one part of what consciousness allows us to do. Recall also that in the introduction to this theory I illustrated the construction of a perceptual triangle out of the Symbolized words "triangle" and "center." Ample evidence for the power of Symbolic Meaningful Conceptualizations in the perception of subjective surfaces exist to give full credence to Axiom II as an explanation of that class of them. (CTE = 0. QP = SMC = 1) Q. E. D.

Axiom I., Theorem 20

Subjective surfaces or contours are a function of the ways that lines and figures pertain (Appurtenance) to one another or belong together.

Appurtenance appears to operate so that subjective surfaces, so called, but which are really phenomenal surfaces, arise when the lines and spaces are constructed in such a way that something is called for by the conditions obtaining. The result is that the phenomenal surface or contour appears. The examples in Figures 4a through 4e (with the exception of 4b whose actual lines complete the triangle so no brightened surface appears) seem to support that view. Special theories have been developed to account for the surfaces, but those have not been theories that have also been meant to be broad enough to account for all of the kinds of perceptual phenomena that have been referred to in the previous 19 theorems. According to the Axiom of Appurtenance a bit of white color, or the perception of a raised surface, or of a contour would all be explained largely by the Axiom of Appurtenance. In addition the Axiom of Symbolic Meaningful Conceptualizations also clearly can play a role in the appearance of a subjective surface as was the case in Figure 4e. In the 1984 version of the theory a 2lst theorem was missing, but I now believe that one is appropriate (see Theorem below)—though it may need the other two axioms to help it along. (ES > l, QPs = A) Q. E. D.

Axiom III., Theorem 21

A *phenomenal* surface can arise when no specific Symbolic Meaningful Conceptualization is present (SMC = 0) and when the Axiom of Appurtenance also does not appear to pertain (A = 0).

The following lines and Fig. 4f. suggest the pure operation of Cortical Tonic Expressivity is at work: — —. I see a lighter quality at the break than is to be expected. Perhaps Appurtenance could be a factor, but the fact that there is not a Symbolic Meaningful Conceptualization at work should be clear. Then the opposition of Cortical Tonic Expressivity resulting when no Symbolic Meaningful Conceptualization is present could well be operating. I don't believe that anything necessarily *pertains* at the break, but I leave it to the reader to determine, for I know of no way to determine unambiguously what may be the case.

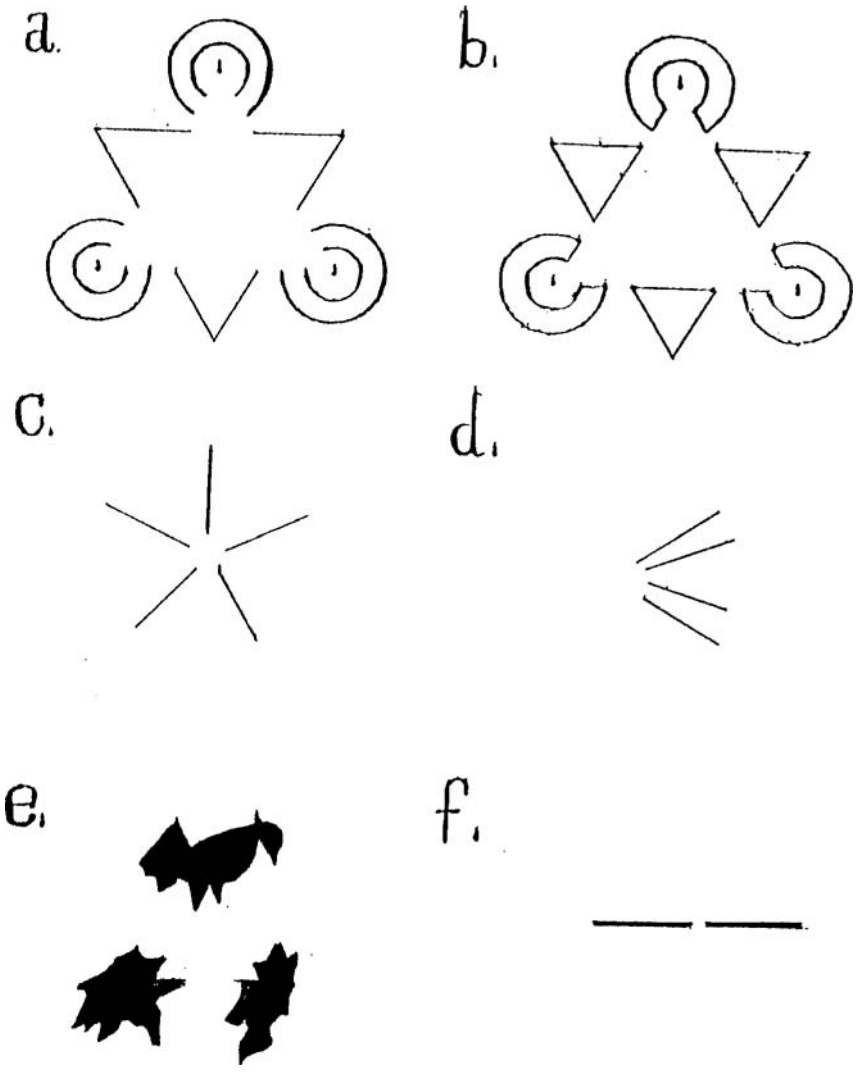


Figure 4. Phenomenal surfaces.

PHENOMENAL SURFACES AND PERCEPTUAL THEORIES

Many chapters of Petry & Meyer's (1987) compilation of research and theories on subjective surfaces and contours presented the basic theoretical factors as the cognitive and the sensory opposing each other. That was certainly true, but the results were to no one's complete satisfaction. The theory presented here eschews both the cognitive, per se, and the sensory, at least as a retinal factor, and sets forth

a three axiom theory to account for all of the phenomena of subjective surfaces. The three axiom theory, however, also accounted for 18 other classes of phenomena. It is meant to be a theory of visual perception that accounts for all perceptual phenomena. The dichotomy between the cognitive and the sensory is here overcome by an integrated theory consisting of three relatively abstract axioms.

What has been presented in this Chapter, however, has a further meaning. That meaning was expressed by Bradley (1987). He claimed that the integration of sensory and cognitive theory represents one of the greatest challenges to perceptual psychology at the present time. It is no accident that this issue should manifest itself so clearly in the theoretical debate surrounding subjective contours: the relative contribution of sensory and cognitive factors in the formation of illusory contours is more nearly equal.

Phenomenal or subjective contours in everyday life are are unusually obvious. Most of the phenomena of visual perception that have been dealt with in this chapter are covered over by the conditions of everyday life. The conditions which allow the appearance of subjective surfaces are thus unusual in being like the conditions that Gogel and others create in their laboratories to allow the basic factors at work in visual perception to be examined and measured. It is in visual perception laboratories, not in the bright light of everyday life that the other factors involved in visual perception can be clarified and thus given their theoretical explanations.

That is precisely what the theory of phenomenal psychology has done in this chapter. Furthermore, just as physicists take a pound of feathers and a pound of lead into a vacuum to show that the law of falling bodies really does hold, so too do the experimenters in visual perception laboratories demonstrate their "laws" by similar procedures. It is only in the area of phenomenal or subjective surfaces where the factors are so blatant that a laboratory setting is not always needed to establish the effects there that are basic to visual perception. There everyday life's perceptions are present for our easy observation. But for the precise demonstration of the rest of our phenomena we need our perception laboratories—just as the physicists need their vacuums.

Now visual perception students need to be accorded what is accorded to the physicists: that even though physicists cannot predict when or where the leaf that falls from the tree on a windy autumn day will fall, we grant that their axioms of inertia and gravitation do predict and explain the fall of all bodies. I trust that in fairness the workers in visual perception will now be granted the same courtesy. It should be clear that the phenomena we perceive in everyday life must follow what has been found in these laboratories. Therefore the actions of people in living their lives is also explained by the axioms just as the three axioms explain the "intrinsic" behaviors that the observers in the experiments displayed indicate what they perceived.

It should also be noted that Heinz Werner's orthogenetic principle of development stated (1978, pp. 108–109) "wherever development occurs it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration." Increasing differentiation and

hierarchic integration is especially instanced by this theory, for the generalized theory stresses the symbolization of experiencings into meaningful conceptualizations of appurtenant values which must change with age. The increasing symbolization of appurtenant values based upon cortical tonic expressivity is an expected outcome of the theory. This theoretical formulation indicates a basis for differentiation and hierarchic integration in these combinations of factors throughout childhood and adolescence. Thus this is a developmental theory of visual perception. As we grow the symbolization of appurtenantly conceptualized *thoughts* and *values* must be more and more affected by the operation of consciousness to integrate all of our functions hierarchically, and thus deepen the kinds of thoughts and values by which the individual person is capable of living.

REFERENCES

Bexton, W. H., Heron, W. & Scott, T. H. (1954). Effects of decreased variation in the sensory environment. *Canadian Journal of Psychology*, 8, 70–76.

Bradley, D. R. (1987). Cognitive contours and perceptual organization. In S. Petry & G. E. Meyer (Eds.), *The perception of illusory contours* (pp. 201–212). New York: Springer-Verlag.

Bruner, J., Postman, T., & Rodriques, T. (1951). Expectation and the perception of color. *American Journal of Psychology, 18*, 216–227.

Carini, L. (1969). The theory of symbolic transformations. *Acta Psycholcgica, 31*, 1–44.

Carini, L. (1973). Explanation of percepts and concepts in schizophrenia. *Psychiatria, Neurologia, Neurochirurgia*, 76, 129–138.

Carini, L. (1984). *Three axioms for a theory of conduct: Philosophy, and the humanistic science of psychology.* Lanham, MD: University Press of America.

Delk, J. L. & Fillenbaum, S. (1965). Differences in perceived color as a function of characteristic color. *American Journal of Psychology, 78*, 200–203.

Glick, J. (1968). An experimental analysis of subject-object relationships in perception. In R. N. Haber (Ed.), *Contemporary theory and research in visual perception* (458–462). New York: Holt, Rinehart & Winston.

Gogel, W. C. (1969). Equidistance effects in visual fields. *American Journal of Psychology, 82*, 342–349.

Gogel, W. C. (1975). Depth adjacency and the Ponzo illusion. *Perception and Psychophysics, 70*, 125–132.

Gogel, W. C. (1984). The role of perceptual interrelations in figural synthesis. In P. Dodwell & T. Gaelli (Eds.), *Figural Synthesis*, New York: Lawrence Erlbaum.

Gogel, W. C. & Newton, R. E. (1975). Depth adjacency and the rod-and-frame illusion. *Perception and Psychophysics, 18*, 163–171.

Gogel, W. C. & Tietz, J. D. (1976). Adjacency and attention as determiners of perceived motion. *Vision Research, 16*, 839–845.

Goldstein, A. G. (1959). Linear acceleration and apparent distance. *American Journal of Psychology, 9*, 267–269.

Heron, W., Doane, B. K., & Scott, T. H. (1956). Visual disturbance after prolonged perceptual isolation. *Canadian Journal of Psychology, 10*, 13–18.

Kennedy, J. M. (1976). Attention, brightness, and the constructive eye. In M. Henle (Ed.), *Vision and Artifact*, New York: Springer.

Koffka, K. (1935). *Principles of Gestalt psychology.* New York: Harcourt Brace.

Köhler, W. & Fishbach, J. (1950). The destruction of the Mueller-Lyer illusion in repeated trials: I. An examination of two theories. *Journal of Experimental Psychology, 40*, 267–281.

Köhler, K. & Wallach, H. (1944). Figural after-effects: An investigation of visual processes. *Proceedings of the American Philosophical Society, 88*, 269–367.

Kuhn, T. E. (1970). *The Structure of Scientfic Revolutions.* Chicago: University of Chicago Press.
Pressey, A. W. & Wilson, A. E. (1974). The Poggendorff illusion in imagination. *Bulletin of the Psychonomic Society, 3.* 447–449.
Ridley, D. R. (1987). A neowhorfian revisitation of color memory. *Perceptual and Motor Skills, 64,* 103–116.
Rock, I. & Ebenholtz, S. (1962). Stroboscopic movement based on change of phenomenal rather than retinal location. *American Journal of Psychology, 75,* 193–207.
Walker, E. H. (1973). A mathematical theory of optical illusions and figural after effects. *Perception and Psychophysics, 13,* 467–486.
Wallach, H. (1963). The perception of neutral colors. *Scientific American, 208* (l), 107–114; 116.
Wapner, S. & Werner, H. (1955). Gestalt laws of organization and organismic theory of perception: Effect of asymmetry induced by the factor of similarity on the position of the apparent median plane and apparent horizon. *American Journal of Psychology, 68,* 258–265.
Wapner, S. & Werner, H. (1957). *Perceptual Development: An investigation within the framework of sensory-tonic field theory.* Worcester, MA: Clark University Press.
Warm, J. S., Wait, R. G., & Loeb, M. (1976). Head restraint enhances visual monitoring performance. *Perception and Psychophysics, 20,* 299–304.
Werner, H. (1946). Genetic psychology, experimental. In P. L. Harriman, (Ed.) *Encycopedia of Psychology* (pp. 219–236). New York: Philosophical Library.
Werner H. (1978). The Concept of development from a comparative and organismic point of view. In S. Barten & M. Franklin (Eds.), *Developmental processes: Heinz Werner's selected writings.* Vol. I. *General theory and perceptual experience* (pp. 107–130). New York: International Universities Press.
Werner, H. (1978). Unity of the senses. In S. Barten & M. Franklin (Eds.), *Developmental processes: Heinz Werner's selected writings.* Vol. I. *General theory and perceptual experience* (pp. 153–167). New York: International Universities Press.
Werner, H. (1978). Motion and motion perception: A study of vicarious functioning. In S. Barten & M. Franklin (Eds.), *Developmental processes: Heinz Werner's selected writings.* Vol. I. *General theory and perceptual experience* (pp. 179–191). New York: International Universities Press.
Werner, H. & Thuma, B. (1942). A deficiency in the perception of apparent motion in children with brain injury. *American Journal of Psychology,* 55, 58–67.
Werner, H. & Wapner, S. (1952). Toward a general theory of perception. *Psychological Review, 59,* 324–338.
Wertheimer, M. (1958). The relations between the sound of a word and its meaning. *American Journal of Psychology, 71,* 412–415.

16

CRITICAL PERSON-IN-ENVIRONMENT TRANSITIONS ACROSS THE LIFE SPAN

Seymour Wapner and *Jack Demick*

Based on elements of sensory-tonic field theory and perceptual development (Werner & Wapner, 1952), organismic-developmental theory and symbol formation (Werner & Kaplan, 1963), the integration of sensory-tonic and organismic-developmental theory (Wapner & Cirillo, 1973), and an organismic-developmental approach to environmental psychology (Wapner, Kaplan, & Cohen, 1973), our current elaborated research program has focused on what we have termed "critical person-in-environment transitions across the life span." Because of our strong belief in the interrelations among problem, theory, method, and practice (e.g., see Wapner & Demick, 2000a) whereby one's theoretical orientation determines, at least in part, what one studies (problem), how ones studies it (method), and if and how one chooses to intervene (practice), this exposition of that program will include, respectively, discussion of:

(a) the rationale behind our chosen paradigmatic problem (including definition of terminology);
(b) some selected theoretical assumptions that underlie our approach to transitions;
(c) our views on methodology; and
(d) the implication of our work for both intervention studies and the practice of clinical psychology.

Wherever appropriate, reference to and/or description of empirical studies will be provided.

DEFINITION OF PROBLEM

There are several implicit assumptions in our stating the problem as "critical person-in-environment transitions across the life span" (cf. interrelations among problem, theory, method, and practice). Usage of the term "person-in-environment" implies the very general idea that the person-in-environment system is the unit of analysis. Thus, we insist that any analysis treating the person independent of an environmental context is incomplete and non-representative; that is, a person does not exist independent of an environmental (whether physical, interpersonal, or sociocultural) context (see: Wapner & Demick, in press, on the increasing context of context in environmental psychology; Wapner & Demick, 1998, 1999, in developmental psychology; and Wapner & Demick, 2000-b, in personality psychology).

Usage of the term "critical" is also of significance. Critical transitions of the person-in-environment system—linked to a powerful perturbation to any aspect of the person, of the environment, or to their interrelations—occur at every stage of the life cycle. Since what is critical for one individual is not necessarily critical for another, it is emphasized that "critical" is experientially defined (foreshadowing the need to complement traditional quantitative methodologies with more qualitative ones). For example, such critical transitions include: the child entering nursery school; the freshman entering college; the individual taking on his or her first full-time job; the person getting married or having children or getting divorced or getting remarried; the migrant or newcomer; the sudden onset of an earthquake or hurricane; the person becoming a retiree; or the older adult entering a nursing home. One focus of our work is to assess similarities and differences across all person-in-environment transitions (e.g., in what ways is the transition of migration like the transition to retirement or the transition from home to nursery school?) as well as to delineate the extent to which each is unique and requires differential processes on the part of the individual undergoing the transition.

While every moment of our lives involves change, our concern is for those critical transitions where a perturbation to the person-in-environment system is *experienced* as so potent that the ongoing modes of transacting with the physical, interpersonal, and socio-cultural features of the environment no longer suffice. Such transitions are of great significance since they may represent the occasion for regressive change or progressive development. A critical transition making for regressive change is evidenced, for example, when an older person entering a nursing home shows severely aggressive behavior toward his or her spouse and/or children and reports feelings of fright, withdrawal, abandonment, depression, disorientation in space and time, and loss of control not shown prior to the

transition. In contrast, there are many critical or dramatic person-in-environment changes that make for progressive development. Consider, for example, the development that occurs when a student leaves home and enters college. In the context of this transition that involves the independence required to live away from home, the adolescent advances not only academically but emotionally and socially as well. In a recent paper on the application of our approach to the more general study of adult development, we (Wapner & Demick, in press-a) have delineated the goals of the various stages of adulthood, which for some may constitute critical person-in-environment transitions. These goals are presented in Table 1.

While we ordinarily focus on transitions that involve some perturbation to the person-in-environment system, researchers in the general area (e.g., Schlossberg, 1984) have pointed to transitions that involve "... changes (such as the loss of career aspirations and non-occurrence of anticipated events, such as an expected job promotion that never comes through)" as well as "... obvious life changes (such as high school graduation, job entry, marriage, birth of first child, bereavement)" (p. 43). These she refers to, respectively, as non-event and event transitions. However, given our espoused reliance on dynamic (part-whole) analyses (below), we prefer to characterize transitions in another way. For example, in the nursery school transition, there is a shift from living in one world (home) to living alternatively in two (nursery school, home) and, hence, there is a challenge to person-in-environment reorganization by *addition*. In contrast, in the transition from high school to college, in relocation of a psychiatric therapeutic community, and in migration/return migration between the United States mainland and Puerto Rico, there is a shift from one world (e.g., college, another hospital setting, U.S. mainland and Puerto Rico) to another. Thus, there is a challenge to reorganization by *substitution*. Further, in transitions such as retirement, there is a shift from living in two or more worlds (work and home in which the latter consists of family, friends, recreation, etc.) to leaving the work world and living in the others only. Therefore, there is a challenge to reorganization by *removal or elimination* of one world.

There are other ways that our approach to critical transitions differs from those of other contemporary researchers. First, much recent research (e.g., Blair, 2000; Pancer, Pratt, Hunsberger, & Gallant, 2000) has focused on aspects (e.g., cognitive expectations) of a particular transition (e.g., transition to first full-time job, transition to parenthood, respectively) and has neither considered the processes underlying the transition in a holistic manner (e.g., interrelations among cognition, affect, valuation, and action over the course of the transition) nor the similarities and/or differences across different transitions. That is, relatively few investigators have provided a theoretical framework such as ours for the examination of critical transitions more generally. Second, within developmental psychology, researchers (e.g., Graber & Brooks-Gunn, 1996) have highlighted the notion that the few current models have been specific to particular transition points (e.g., pubertal development), but that "... to understand which individuals are affected by transitions and

TABLE 1. Some tasks or goals to be fulfilled at different periods during the course of human development with respect to various aspects of the person-in-environment system

Category	Tasks or Goals
PERSON	
Physical/Biological	18–35 years: Optimal Physical Development; desire for physical fitness; fulfillment of sexual desires
	35–60 years: Coping with and adjusting to decreasing physical strength and physical changes of middle age
	60 years and on: Continued coping with physical changes
Psychological/ Conceptual	18–35 years: Develop and maximize cognitive (sensorimotor, perceptual, skills; affective functions; appropriate values; develop independence; self concept; self-esteem; self control; self-efficacy; self identity; cope with mid-life crises; objectivity; individually oriented dignity; sense of security; develop and work toward occupational goals; find life work
	35–60 years: Develop leisure time activities
Sociocultural	18–35 years: Marriage; parenthood; serving as wife and mother; managing a home and family; household provider; getting started in an occupation and achieving success; optimizing relation between work and home worlds
	35–60 years: Grandparenting; coping with possible divorce; adjusting to remarriage; step parenting; caring for aging parents
	60 years and on: Disengagement from work; retirement; care for aging parents; coping with possible loss of partner
ENVIRONMENT	
Physical	18–35 years: Leave home and establish satisfactory physical living arrangements; adapt to physical location and nature of physical work place
Interpersonal	18–35 years: Seek affiliation; social support; social network; attachment; friendship love; emotional bonds; select a mate; intimacy with others; develop an optimal spousal relationship; start family; childbirth; raising children and possibly step-children; possibility of coping with divorce; develop social milieu
	35–60 years: Coping with empty nest
	60 years and on: Find a comfortable social network; adjust to loss of one's significant other; establishing an explicit affiliate relationship with one's age group; coping with social interaction that declines in older age groups
Sociocultural	18–35 years: Develop educationally; develop social networks that conform to cultural setting; adopt civic and societal responsibility; adhere to societal rules and regulations; getting started in an occupation
	35–60 years: Achieve adult and societal responsibility

how transitions are navigated, more specific models are needed" (p. 768). Thus, our approach to critical person-in-environment transitions across the life span—which consists of a general developmental psychology complemented by a differential psychology (below)—may begin to fill in the gap.

Underlying Assumptions Shaping Empirical Problems

On the most general level, our approach is:

1. *holistic* insofar as we assume that the person-in-environment system is an integrated system, whose parts may be considered in relation to the functioning whole;
2. *developmental* insofar as we assume that progression and regression may be assessed against the ideal of development embodied in the *orthogenetic principle* (change from dedifferentiated to differentiated and hierarchically integrated person-in-environment functioning) and that development encompasses not only *ontogenesis*, but additional processes such as *phylogenesis* (e.g., adaptation manifest by different species), *microgenesis* (e.g., development of a percept or idea), *pathogenesis* (e.g., development of both functional and organic pathology), and *ethnogenesis* (e.g., changes during the history of humankind); and
3. *systems-oriented* insofar as we assume that the person-in-environment system is the unit of analysis, which includes three aspects of the *person* (*biological*, e.g., health; *intra-psychological*, e.g., stress; *sociocultural*, role) and three analogous aspects of the *environment* (*physical*, e.g., natural or built; *inter-organismic*, e.g., friends, relatives, pets; *sociocultural*, e.g., rules, laws of society).

   Corollary notions include the assumptions of:

4. *transactionalism* (the person and the environment mutually define, and cannot be considered independent of, one another; similarly, the person-in-environment system's experience—consisting of cognitive, affective, and valuative processes—and action are inseparable and operate contemporaneously under normal conditions);
5. *multiple modes of analysis* including *structural analysis* (part-whole relations) and *dynamic analysis* (means-ends relationships);
6. *constructivism* (the person-in-environment system actively constructs or construes his or her experience of the environment);
7. *multiple intentionality* (the person-in-environment system adopts different intentions with respect to self-world relations, i.e., toward self or world-out-there);
8. *directedness and planning* (the person-in-environment system is directed toward both long- and short-term goals related to the capacity to plan);
9. *multiple worlds* (the person-in-environment system operates in different spheres of existence, e.g., home, work, recreation); and
10. preference for *process rather than achievement* analysis.

Toward demonstrating the ways in which these assumptions help us frame empirical problems on critical person-in-environment transitions across the life span, a basic overarching framework followed by examples of empirical work at

each level of analysis is now presented. Specifically, from our point of view, a critical transition may be initiated whenever there is a perturbation to any aspect of the person-in-environment system at any level of integration. That is, a perturbation may occur at the biological, intra-psychological, and/or sociocultural level of the person and/or at the physical, interpersonal, and/or sociocultural level of the environment. In line with our assumptions, we have characteristically examined the ways in which a perturbation at any given site impacts the site itself, the other sites, and the system as a whole. While Table 2 presents the array of transition studies that we have considered and/or conducted, we now present a brief synopsis of one study initiated at each site of the person-in-environment relationship (see Wapner & Demick, 1998, for a comprehensive review of all studies at all sites).

Biological Aspect of Person

Collazo (1985) conducted an investigation that examined the transition from health to illness as manifest in the onset of diabetes. He analyzed a number of relations between the focal person (self) and other parts of the person-in-environment system including: (a) the relations between one's psychological and biological self as influenced by changes in the metabolism of sugar; (b) transactions with physical aspects of the environment (e.g., unwillingness to move beyond the physical confines of the home community related to concern for the availability of insulin supplies); (c) the relations with the interpersonal aspects of the environment (e.g., dependence on others, fear of getting married; and (d) the relations to the sociocultural context (e.g., changes in the behavior and values of the individual related to culturally defined attitudes toward the sick). See Wapner and Demick (1998) for a more complete description.

Intra-Psychological Aspect of Person

Here, we (e.g., Demick & Wapner, 1980; Demick, Peicott, & Wapner, 1985) have conducted a series of longitudinal studies on the development of psychopathology (e.g., alcoholism, schizophrenia, antisocial personality) and the ways in which such pathology impacts the person-in-environment system over the course of psychiatric hospitalization. As we have noted, alcoholics, prior to treatment, manifest rigid, differentiated boundaries between self and environment with an over-focusing on the environment at the expense of on self. This is in line with the theoretical conceptualization of self-environment differentiation first proposed by Werner (1940/1957). This conceptualization has most commonly been applied to schizophrenia. For instance, various investigators (e.g., Des Lauriers, 1962) have speculated that the schizophrenics' loss of boundaries (e.g., failure to separate self from environment) is the fundamental defect of this disorder. Further, we assume that the optimal relationship of the person-in-environment state is indicated by the person's ability to shift back and forth from focusing on different objects of experience, namely, on the self, on the environment, and on self-environment relations. Deviations from this optimal condition (i.e., shifts exclusively from a self-focus to an environment-focus or conversely from an environment- to a self-focus) are considered to represent

TABLE 2. Sites and examples of perturbations to person-in-environment system which may initiate critical transitions[1]

PERSON (× ENVIRONMENT)	ENVIRONMENT (× PERSON)
PHYSICAL (BIOLOGICAL)	*PHYSICAL*
Age (e.g., onset of puberty, menopause, death)	*Objects* (e.g., *Acquisition or loss of cherished possessions*)
Pregnancy	*Disaster* (e.g., *onset of flood, hurricane, earthquake, tornado, volcanic eruption, nuclear war*)
Disability	*Relocation* (e.g., *psychiatric community, nursing home, rural,* urban, *transfer to new college, migration*)
Illness	Urban Change (e.g., decline, *renewal*)
- Addiction (e.g., onset and *termination of alcoholism, obesity,* drug addiction	Rural Change (e.g., industrialization)
- *Chronic* (e.g., *onset of diabetes, rheumatoid arthritis*)	
- Acute (e.g., onset and treatment of cancer, *AIDS*)	
PSYCHOLOGICAL	*INTERPERSONAL*
Body Experience (e.g., *increase or decrease in size of body,* onset of experience of positive or negative body evaluation, acquisition or loss of cherished possessions)	*Peer Relations* (e.g., *making or dissolving a friendship or social network, falling in or out of love*)
Self Experience (e.g., self concept and experience of control, dignity, identity, power, security as in *onset of or recovery from mental illness,* changing role in social network)	Family (e.g., change in extended family, immediate family, parents, relatives)
	Neighbors
	Co-workers
	Roommates
	Teachers
SOCIO-CULTURAL	*SOCIO-CULTURAL*
Role	Economics (e.g., new technology, job opportunity)
- *Work* (e.g., becoming employed, temporarily employed, *unemployed, retired*)	*Educational* (e.g., *nursery school,* kindergarten, elementary school, *high school, college, sojourn to university abroad,* graduate or *professional school*)
- Financial (e.g., becoming rich as in winning lottery, becoming poor as in stock market crash	*Legal* (e.g., abortion legislation, driving age, *automobile seat belt legislation,* child abuse, retirement legislation, euthanasia)
- Educational (e.g., Professor, students administrator	Mores (e.g., attitude toward sex)
- *Marital* (e.g., being married, *divorced,* widowed, *parenthood, adoption*)	Political (e.g., social, country, prison, defection)
- *Religious* (e.g., becoming priest, minister, rabbi, nun, Jesuit, "Born Again" Christian, conversion)	Religious (e.g., oppression, change in policy re female ministers and rabbis, celibacy of priests
- Political (e.g., becoming a refugee, undercover agent, war veteran, holocaust survivor, survivor of terrorism, elected official)	*Organizational (Industry) Leadership*
- Cultural (e.g., becoming a celebrity, member of your cult group)	
Ethnicity (e.g., becoming aware, proud of, ashamed of background)	
Gender (e.g., changing sexual orientation, from justice to caring orientation)	

[1] Italicized items indicate published studies or studies in progress.
SOURCE: Wapner, S., & Demick, J. (1998). Developmental analysis: A holistic, developmental, systems-oriented perspective. In W. Damon (Series Ed.) & R. M. Lerner (Vol. Ed.), Handbook *of child psychology: Vol. 1. Theoretical models of human development* (5th ed., pp. 761–805). New York: Wiley.

examples of *regression*. Moving then toward optimal self-world relations may be considered to represent *progression*.

Sociocultural Aspect of Person

Adoption—and specifically, the transition to adoptive parenthood—has been studied extensively by Demick and his associates (e.g., Aronson, Ronayne, Hayaki, & Demick, 1994; Demick, 1993; Demick & Wapner, 1988b; DiLallo, Pinet, Lamb, & Demick, 2001; Silverstein & Demick, 1994; Soparkar, Demick, Levin, & Wapner, 1988). One way in which these investigators have approached the problem was to explore differences between two transitions, namely, that of open versus closed adoption (communication vs. no communication between biological and adoptive parents). Of particular interest is the following complex of issues:

> ... adoptive families characterized by a total separation between the adopted child and his or her family of origin—as is usually the case in traditional, closed adoption—may be conceptualized as *dedifferentiated* (all members of the family either consciously or unconsciously deny that the child has been adopted), *differentiated and isolated* (adoptive parents shelter the adoptee so that he or she will not learn about the biological parents from others and/or will not have to deal with the stigma of being adopted), or *differentiated and in conflict* (the adoptee may fantasize that the biological parents would treat him or her differently and/or may threaten to leave the adoptive family to find the "real parents" when of age). In contrast, the adoptive family characterized by less absolute separation between the adoptee and his or her family of origin (the case of open adoption) may be conceptualized as *differentiated and integrated* (the adoptee may be able to integrate the various aspects of his or her dual identities, possibly mitigating potential problems with identity and self-esteem; in a similar manner, the adoptive parents may be able to integrate the different aspects of the adoptee's identity so as to avoid blaming "bad blood in the background" for any of their difficulties. (Demick and Wapner, 1988b, pp. 241–242)

Paralleling this conceptualization of developmentally-ordered self-world relationships are correlative modes of coping (also developmentally-ordered) as follow (cf. Apter, 1976): dedifferentiated person-in-environment (P-in-E) system states characteristically employ *passive accommodation* (whereby the individual passively goes along with environmental demands); differentiated and isolated P-in-E states, *disengagement* (whereby the individual withdraws and removes self from environment); differentiated and conflicted P-in-E system states, *nonconstructive ventilation* (in which the person maintains conflicted relations with aspects of the environment); and differentiated and integrated P-in-E system states, *constructive assertion* (in which the person takes positive constructive action vis-à-vis aspects of the environment). These modes of coping, along with other person-in-environment processes such as planning represent aspects of our process analysis that complement our formal typology of person-in-environment relations.

Physical Aspect of Environment

Wapner (1983) has treated the problem of living with radical disruptions of person-in-environment systems induced by *natural disasters* such as floods, earthquakes, hurricanes, tornadoes, volcanic eruptions, and nuclear war. He has included an analysis of the disaster cycle with respect to five phases: (a) disastrous event remote (anticipating disaster); (b) disastrous event imminent (warning); (c) impact (system shock); (d) soon after impact; and (e) later on after impact (reconstruction and aftermath). In line with this analysis, an empirical study was conducted on the impact of the 1992 Hurricane Andrew on a Bahamian person-in-environment system. The study provided support for our developmental conceptualization. That is, with Warning of the Disaster, individuals show evidence conforming to the *dedifferentiated person-in-environment system state* insofar as they exhibit wishful thinking involved in the denial of danger, greater dependence on authority figures, and egocentricity. There were others during the Warning of the Disaster who conformed to the *differentiated and isolated person-in-environment system state*; some indicated that they could not do anything about the storm and others withdrew by action (e.g., locked self in rooms, locked self in church). Still others conformed to the *differentiated and in conflict person-in-environment system state* insofar as they exhibited rebelliousness to authority as evidenced by blaming authorities for not warning properly. There was little evidence at this Warning of the Disaster stage of the differentiated and hierarchically integrated mode of coping, as expressed by one respondent, a youth minister who stated, "I tried to get my situation right. I made sure my house was battened up... and then I went out to help some elderly... you have to have a plan." (Chea & Wapner, 1995, p. 90).

Interpersonal Aspect of Environment

Here, Roelke (1989, Thomason, 1985) has studied the nature and the development of friendships. Utilizing such dimensions as similarities between self and other, dealing with conflicts and disagreements, and self-disclosure (information shared), she has found that, with increasing interdependence (as obtains over the course of friendship development), there was an increase in the differentiation and integration of the parts (self, other) that constituted the friendship relationship as well as an increase in the flexibility of the friendship experience. In a follow-up study, she has also found that friendships can be categorized developmentally in terms of the orthogenetic principle, as follows:

1. *focused friendship experience*, which she characterized as undifferentiated insofar as the friend is primarily involved in only one sphere of existence;
2. *enmeshed friendship experience*, which she described as differentiated and overlapping since the friend is involved in *all* spheres of existence;
3. *segmented friendship experience* in which the relationship is differentiated and isolated since the friend is involved in several isolated spheres, some of which are more important to the friendship than are others; and

4. *differentiated and integrated friendship experience* whereby the friendship involves a number of interconnected, shared spheres of existence, some of which are more important in the relationship than are others.

In line with this, Roelke (1993) has also identified processes underlying friendship development. For example, she has noted that: it is the individual's active construal of his or her friendships that is the significant unit of analysis from an experiential perspective. It is important to emphasize that the focus of this particular study is on the individual's cognitive construction of the friendship, and not an analysis of interaction at the dyadic level. Not only does the individual's construal of the friendship provide the best window on the meaning of the friendship in the person's life, but our constructions also help to shape actual interactions with our friends as well as the course of the relationship as a whole (Duck & Sants, 1983, p. 122).

Further, she has identified six social support functions that underlie friendship development. These functions have included: social integration; contribution to self-esteem; opportunity to provide nurturance; assistance; emotional closeness; and stability/reliability. Ratings on these functions have revealed that all are low for non-close friendships. For close relationships, emotional closeness and stability/reliability received significantly higher ratings, while more intimate functions (opportunity to provide nurturance, emotional closeness, stability/reliability) were rated as particularly important in differentiated and integrated friendship relationships.

Sociocultural Aspect of Environment

We have conducted a series of studies on automobile safety belt experience prior to and following the initiation of mandatory safety belt legislation in Japan (Hiroshima) and in the United States (Massachusetts). As Demick, Inoue, Wapner, Ishii, Minami, Nishiyama, and Yamamoto (1992) have documented, in the context of the highway, the observed rates are significantly higher in Hiroshima on all occasions—possibly related to stricter enforcement in Hiroshima relative to Massachusetts. However, in the city, the rates are significantly higher in Massachusetts only 2 months after legislation. This may be related to the fact that, on this occasion, safety belt use was enforced on both the highway and in the city in Massachusetts, whereas only on the highway in Hiroshima.

However, once safety belt use began to be enforced in the city 1 year later, Hiroshima rates skyrocketed to an astounding 91% in the city and an equally astounding 98% on the highway. In both sociocultural contexts, there is an increase in drivers' use of safety belts on the highway from the test occasion immediately following legislation. However, although the rates begin to level off and remain constant or further increase in Hiroshima, they continue to decrease steadily in Massachusetts (p. 482)

Complementing these studies, G. Bertini and Wapner (1992) have provided more striking findings based on observations in the city of Rome prior to and

following introduction of an automobile safety belt law in Italy. They have found that rates rose to 54.8% just after legislation, then dropped to 28.0% 6 months later, and continued to drop even further to 4.5% 3 years later. In fact, they have even provided anecdotal evidence that some individuals in Italy, rather than comply with the law, wore tee shirts with pictures of safety belts emblazoned across them.

METHODOLOGICAL CONSIDERATIONS: METHODS, DESIGNS, AND TECHNIQUES

In light of the constructivist underpinning of our approach, we have typically been concerned, in all of our research, with describing the relations both among and within the parts (person, environment) that make up the integrated whole (person-in-environment system) as well as with specifying the conditions that make for changes in the organization of these relations. Therefore, our approach has consistently been wedded to the complementarity of *explication* (description) and *causal explanation* (conditions under which cause-effect relations occur) rather than being restricted to one or the other. Further, our assumptions impact our choice of paradigmatic problems (such as that described herein) as well as our preferred method of research (i.e., flexible drawing from both quantitative and qualitative methodologies depending on the level of integration and nature of the problem under scrutiny). In this regard, we agree with Maslow's (1946) preference for problem- rather than means-oriented research. For example, rather than having investigators determine relevant problems that may be studied using their preferred method(s), investigators should be open to studying interesting problems that, in turn, determine the appropriate method(s).

To understand the methodological intricacies of our empirical work, a further discussion of the empirical designs and techniques used in a number of our studies under the aegis of our perspective follows. Since the general approach focuses on transitions (i.e., experience as well as action with the environment including its physical, interpersonal, and sociocultural aspects), it is characteristic that a wide range of designs and techniques is used.

In general, two types of designs, *cross-sectional* and *longitudinal,* have been employed. Cross-sectional analyses represent an attempt to capture an a-temporal relationship between abstracted variables or a set of relationships by assessing contrasting groups or conditions at a given point in time. For example, Wofsey, Rierdan, and Wapner (1979), by varying agent status, have studied the impact of the presence or absence of plans on how graduating undergraduates construed the environment, which they were about to leave. Both *drawing* and *verbal description techniques* were used by participants to represent the university environment. Findings from the two techniques were convergent: both pointed to greater psychological distancing from the current university environment by seniors with articulated plans for the future compared to those without plans. In one striking example, a senior with extremely well articulated plans for his future represented Clark University as a

dot on the Western Hemisphere with a caption reading "Freud spoke here (and hated it)."

Relative to the issue of links between theory and method, the criterion "distancing from the environment" is a measure based on a formal structural aspect—degree of differentiation between self and environment—that may be applicable to a variety of contexts. For example, drawing categories indicative of remoteness from the environment (greater self-world distancing) have included: map-like; aerial view; static; objective (e.g., factual titles); and geometric form. Categories indicative of closeness to the environment (lesser self-world distancing) have included: close-up view; subjective/idiosyncratic; subjective descriptions added; person-environment transactions; and three-dimensional perspective (cf. Demick & Wapner, 1980). Recognizing the possibility of sample-specific findings, it is significant methodologically that cross-validation with new participant samples (psychiatric patients and staff members) was employed with consistent support of the findings (below).

Others using cross-sectional designs have varied the environmental context as well as the agent status. For example, Dandonoli, Demick, and Wapner (1990) have introduced, in addition to drawings and verbal representations, the technique of *memory reconstruction of a miniature model of a room and its contents*, which is especially valuable for use with children, who may have both verbal and drawing limitations. Further, Edelman, Rierdan, and Wapner (1977) have found that the audience—self, intimate other, stranger—significantly affected the linguistic representation of the environment with respect to such dimensions as egocentricity, vocabulary, depth, emotionality, evaluation, and ambiguity. As they noted, it is of methodological significance that studies using "... environmental representation must consider the audience—implicit or explicit—to whom the representation is addressed" (p. 431).

In contrast, the majority of our work on critical person-in-environment transitions has employed ecologically valid field studies with assessments made over time. These longitudinal studies have primarily utilized responses to a relatively fixed set of tasks at different time slices. Such time series studies may require introduction of controls for the effects of repeated measurements. That is, time sampling has, where possible, involved assessments across various points in the transition process and has provided a reconstruction of the changing transactions of individuals with their environments (e.g., see Schouela, Steinberg, Leveton, & Wapner, 1980, on college students' cognitive representations of a university environment over time).

Case studies of various kinds, group analyses, and systems analyses with longitudinal designs have also been employed. An example of longitudinal analyses using case studies comes from Cohen, Wapner, Pruginin, and Dandonoli (1974), who studied students spending a year in Israel as temporary migrants. Here, the following techniques were employed: (a) *personal construct forms* covering expectations prior to departure, experiences of different aspects of the environment at different times, etc.; (b) *psychological distance maps for "people" and "places"* on which participants were asked to represent their feelings of psychological closeness to people or to places, respectively, that constituted their psychological environments;

(c) *topographical maps* of their new environments; (d) *activity logs* on which they were asked to note and to characterize salient events at different times in their sojourn; (e) *landscape impression checklists* to assess the changing salience of different environmental features; and (f) a *communication inventory* (of letters and telephone calls to members of their old and new environments).

On the basis of these instruments, an analysis of one case study, for example, suggested shifts in attitude toward the home environment (from bondage to positive close feelings), an increasing sense of membership in the new environment, greater independence and self-confidence, greater integration of places in the new environment, and greater acceptance by others. In contrast, another case study revealed the failure to become integrated in the new environment. More specifically, Wapner has described this student as follows:

> Y had a definite mission in mind in going to Israel: He wanted to enrich himself in terms of his studies, learn to improve his Hebrew, increase his self-sufficiency, learn to adapt to a new environment away from home. From a superficial point of view—we had no instruments to assess depth—Y appears to be an extremely self-sufficient person. As far as could be determined from his protocols, his real home environment, although it might impinge on him externally, did not seem to intrude on his relations to the new context. From his personal comments and his activity logs, there is evidence that his family did come to visit him in Israel, but he notes that this contact did not alter his routine operations and observations. On the psychological distance maps, his home is only represented twice, in the initial map and the final map before returning home. The general picture that emerges is that he cut off the home base once he arrived, and resurrected it only when he was ready to leave. (Wapner, Kaplan, and Cohen, 1976, pp. 223–224)

Of methodological importance was the evidence that it is possible to link participants' reconstructions with indices from these various techniques.

Another type of longitudinal case study with a temporary sojourner to a professional meeting used what was called the *debriefing technique* (Kaplan, Pemstein, Cohen, & Wapner, 1974). Prior to the trip, the investigators asked the participant to keep a diary of his experience with persons, places, and things prior to leaving home, during travel to the new environment, during travel home, and once back in the home environment. Because of the open-ended nature of such instructions, the participant is typically left on his or her own, thus operating as a participant-investigator. On return, the debriefing begins. The investigators change roles to become partial participants, that is, asking questions of the participant that stem from their own interests and experiences. Simultaneously, the participant in the debriefing session becomes more of an investigator in the sense that he or she asks himself or herself questions about his or her experience from a more objective point of view.

Another longitudinal analysis was conducted in the previously mentioned study (Schouela et al., 1980) using freshmen entering the university where assessments were made concerning how the participants construed and transacted with

the university environment, including its physical, interpersonal, and sociocultural aspects. It utilized *sketch maps* coupled with a follow-up inquiry, *open-ended interviews*, psychological distance maps with a follow-up inquiry, and *retrospective reports on discrepancies between personal expectations of the environment and experienced actuality*. Assessments were made for primary participants on 6 test occasions after arrival on campus, ranging from 1–3 days to 24 weeks. To control for the effect of repeated testing, two additional groups were employed: one started on the second test occasion and was tested four more times, while another started on the fourth test occasion and was tested two more times. Sketch map findings have illustrated the way in which the approach shapes the analysis: formed/structural features of the maps were scored (e.g., correctly articulated buildings, completed subregions, distortion of spatial relations) and revealed, over time, a progression toward greater differentiation, articulation, and integration.

Another study (Demick & Wapner, 1980) using longitudinal analysis dealt with the effects of environmental relocation on members of a psychiatric therapeutic community. Schizophrenics, antisocial personalities, and staff members were tested prior to (3–4 weeks; 2–3 days) and following (2–3 days after; 3–4 weeks) relocation of a psychiatric hospital. Changes were assessed in: (a) experience of self (*apparent head size estimation, body- and self-cathexis*); (b) experience of environment (including sketch maps and psychological distance maps); and (c) experience of self-environment relations (*body buffer zone, hospital information test*).

There was evidence of differential changes over the course of relocation dependent on participant group (schizophrenics vs. antisocial personalities). For example, while the schizophrenic group overestimated their head width more immediately preceding and immediately following relocation, the antisocial group overestimated their head width less on those two occasions. The schizophrenics' descriptions of the rooms within the hospital also became less accurate and less detailed surrounding relocation, while this did not occur for the antisocial personalities. Further, while schizophrenics rated their relationships with others as less intense and less permanent on the two test occasions closest to the move, antisocial personalities rated them as more intense. The differential effects for the two groups squared with the proposition that the stress of the move made for an exacerbation of the particular pathology. Moreover, the study has pointed to the importance of agent differences in the construal and representation of environments under critical perturbations of the environmental setting.

A systems-type longitudinal analysis is exemplified in a pilot study (Ciottone, Demick, Pacheco, Quirk, & Wapner, 1980) on the transition from home to nursery school of both handicapped and non-handicapped children. Here, we were interested in obtaining information on the physical and interpersonal as well as sociocultural aspects of both the home/family and nursery school systems. Since the analysis treats all members of the systems affected by the child's transactions, many participants were included. The home setting for one child might include, for example, mother, father, brother, and at the time of testing, two investigators; the bus ride includes the bus driver, a number of other children, and the investigator-observer; at the nursery school, there are a number of personnel

including teachers, administrators, and investigator-observers. This makes for an extraordinarily large number of persons who are part of the interpersonal aspect of the two relevant environments.

For this reason, quite diverse techniques were required: (a) *interviews*—with parents, siblings, teachers, the nursery school child, bus driver, etc.—which cover, from the perspective of each person, the anticipations, concerns, happenings, modes of adapting, etc. concerning the child's entry into nursery school; (b) *play techniques*—such as telling a story in the context of doll play with houses representing home and school, which presumably cover cognitive, affective, and valuative aspects of the child's experience—and other techniques such as drawing and placement of felt cut-outs of people and things on a felt board; and (c) *observations of focal children and of objects/places and persons* comprising the immediate environmental context. The goal was to obtain information concerning the transactions among children and teachers, the intentions underlying these transactions, and the modes of construing the physical, interpersonal, and sociocultural aspects of the environment.

Here, the child must ideally operate effectively in two contexts, each with different demands. Specifically, he or she must be able to organize his or her transactions at home and at school into differentiated and integrated spheres of activity (multiple worlds). Our research has indicated the following. When children import behavior and objects from one setting to the next indiscriminately, they are exhibiting developmentally less advanced transactions since such behavior implies fusion of home and school contexts. If with further exposure, their transactions are appropriate to the context (e.g., the child states, "am going to play school here at home"), then the child is exhibiting actions indicative of more advanced developmental status.

Further, we have found that the transition to nursery school impacts not only the child but his or her parents as well. In one case study, we (Ciottone, Demick, Pacheco, Quirk, & Wapner, 1980) have evidence that the transition to nursery school impacted one mother at all levels of organization, namely, physical aspect of self (e.g., the mother needed to wake up earlier), psychological aspect of self (e.g., the mother thought about going back to school herself), sociocultural aspect of self (e.g., the mother perceived herself as the parent of a preschooler), physical aspect of environment (e.g., the mother felt a need to keep the house clean so that her daughter might bring home friends from school), interpersonal aspect of environment (e.g., the mother developed a connection to the school bus driver), and sociocultural aspect of environment (e.g., the mother became aware of new rules and mores both at home and at school). Such research has suggested that—as a complement to more traditional experimental studies—it is profitable, using qualitative methodologies, to reduce the number of focal individuals studied (here, children transitioning to nursery school) rather than the number and kinds of interrelationships among aspects of the person, of the environment, and of the systems to which they belong.

While it is evident from these examples that we have used a variety of methods and techniques, it would be valuable to go even further. That is, we believe that the

analysis of critical transitions calls for the complementary utilization of methods that cut across disciplines (cf. Redondo, Pacheco, Cohen, Kaplan, & Wapner, 1981). That is, in our ongoing and projected studies, we envision the use of techniques from anthropology (e.g., componential analysis), linguistics (e.g., semantic structures), clinical psychology (e.g., Rorschach and TAT analysis), rhetoric (e.g., analysis of proverbs, figures of speech), etc. to gain a fuller appreciation of what goes on in the "many minds" of individuals when they are confronted with voluntary or involuntary, physical and/or psychological, sudden or chronic ruptures in the person-in-environment systems of which they are a part.

IMPLICATIONS FOR PRACTICE

Based on the above, our approach and the research generated from within it—which views theory and praxis as flip sides of the same coin—have several implications for practice (e.g., clinical psychology). These implications include the following.

1. Practitioners need to acknowledge that what is critical for one person is not necessarily critical for another and that what constitutes a "critical" transition for any given individual must be experientially defined. Thus, rather than assuming that any given normative transition (e.g., transition to middle age) will pose difficulty for his or her client, the clinician needs to listen for signs concerning those transitions that the client himself or herself identifies as problematic.
2. The clinician also needs to understand that a critical transition has the potential to impact functioning at all levels of the person and with respect to all levels of the environment (i.e., both individual parts and the whole). For example, our research has uncovered that, following a critical person-in-environment transition, disturbances in aspects of body experience usually parallel the more expected disturbances in aspects of self experience (see Demick & Wapner, 1988a, on the ways in which body experience, surprisingly, may be affected by the transition to adoptive parenthood).
3. In addition to all levels of the person transacting with all levels of the environment to form a unified whole (above), our holistic assumption also holds for functioning within a given level (e.g., psychological level consisting of cognitive, affective, valuative, and action processes). Thus, individuals undergoing transitions and clinicians may do well to explore the interrelations among *all* psychological part-processes, rather than only—as is customarily the case—to acknowledge the relations between cognition and affect.
4. When faced with a critical transition, the person-in-environment system might benefit from self-world distancing, which may promote developmental change in one of two ways. Specifically, an increase in self-world distancing between the P-in-E system and affectively laden material may

permit the system to operate more optimally insofar as there is greater separation between cognition and negative affect (cf. Nair, 1961). More generally, a decrease in self-world distancing between the P-in-E system and the consequences of his or her negative actions may lead to safer, more optimal P-in-E functioning.

5. Wapner and Demick (1998) have documented the phenomenon of "reculer pour mieux sauter" (draw back to leap): "A negative experience (e.g., loss of self-esteem) may serve the positive function of fostering greater self-insight and providing the formal condition of 'dissolution of a prior organization of the self,' thereby permitting a creative reorganization of self." (p. 795).
6. Individual differences in the experience of critical P-in-E transitions (and correlative modes of Coping; see p. 8), namely, *dedifferentiated* (passive accommodation), *differentiated and isolated* (disengagement), *differentiated and in conflict* (non-constructive ventilation), and *differentiated and integrated* (constructive assertion) may be a useful lens for clinicians to assess the range of reactions to the same transition across their different clients.
7. Physical, interpersonal, and social anchor points may facilitate the adaptation of P-in-E systems to a range of critical transitions across the life span (from the child's entry into nursery school to the older adult's adaptation to the nursing home environment).
8. A simple request for the P-in-E system to verbalize plans about actions to be taken to advance himself or herself to a new, more ideal P-in-E system (as well as more extensive planning processes) may bring the desired state into effect.
9. Making the P-in-E system more aware of the precipitating triggers to action may lead to more optimal P-in-E functioning both generally and over the course of critical transitions.
10. System members (e.g., spouses, co-workers) have the potential to impact both positively and/or negatively an individual's critical transition; thus, clinicians might attempt to facilitate the individual's transition experience by fostering congruence between the individual's and his or her system members' experience.
11. In light of our conceptualization of adaptation as consisting of optimal relations between the person and his or her environment (person-in-environment fit or congruence), individuals undergoing critical transitions and clinicians may do well *not* to see adaptation as a one-way street; rather, the person may adjust to the environment, the environment may adjust to the person, or both.

In concluding this section on the implications of our approach for practice, we now present one example of intervention research on a problem of extreme social significance, namely, safe sex practices and protection against AIDS. As a first step, Ferguson, Wapner, and Quirk (1993) asked college students to report on sexual situations in which they "did not do what they wanted to do" and

situations in which they "did do what they wanted to do" with respect to protection against the sexual transmission of HIV (illustrating our more general concern with the relations between experience and action). Responses were then categorized in our developmental terms as follow: (a) *dedifferentiated* (e.g., "I was so aroused at that point that I didn't worry about HIV"); (b) *differentiated and isolated* (e.g., "I do everything except that because it decreases my chances of contracting HIV"); (c) *differentiated and in conflict* (e.g., "She insisted that I not use a condom so I didn't against my will"); and (d) *differentiated and hierarchically integrated* (e.g., "I use protection because I am aware of the consequences of unprotected sex . . . protected sex is of utmost importance"). Findings indicated that, when individuals reported that they "did what they wanted to," differentiated and hierarchically integrated responses were most frequent; when they reported situations in which they "did not do what they wanted to do," their responses were characteristically less advanced (i.e., dedifferentiated, differentiated and in conflict).

On the basis of these data, Clark (1995) then introduced three interventions to change unsafe behavior in sexual contexts: (a) providing information about the HIV/AIDS disease and how the virus is transmitted; (b) providing information on how HIV/AIDS is transmitted as well as accounts from the Ferguson et al. (1993) study of actions when participants "did what they wanted to do" and when they "did not do what they wanted to do"; and (c) providing information about how the HIV/AIDS is transmitted and a tailored imagery exercise (in which they were asked to imagine the consequences of one of the accounts of reported unsafe behavior from which they were to assume that they had contracted HIV). Findings indicated that, relative to those in the first two conditions, those in the third condition (personalized treatment to decrease the psychological distance between the participant and the threat of HIV/AIDS) reported a significantly greater frequency of practicing safe sex. Such interventions also have relevance for other critical problems on which we have worked, for example, the experience of automobile safety belts and subsequent intervention to increase safety belt usage.

SUMMARY AND CONCLUSIONS

Our holistic, developmental, systems-oriented program of research has made use of such assumptions as: holism; transactionalism; structural and dynamic analyses; constructivism; process versus achievement; development as a mode of analysis (orthogenetic principle); developmentally-ordered individual differences; and methodological flexibility. In line with these assumptions, we have conducted numerous empirical studies on critical person-in-environment transitions across the life span aimed at moving both: (a) the individual faced with a critical transition to an optimal, differentiated and integrated person-in-environment system state; and (b) the field of psychology to a differentiated and integrated academic discipline with implications for problem, theory, method, and practice. We have clearly drawn on Werner's (1940/1957) classic organismic and developmental notions.

Both his approach and our own elaboration have been organismic insofar as we maintain that we should study the active, striving, feeling individual in all of his or her complexity and developmental in that we advocate for development as a mode of analysis applicable to diverse aspects of person-in-environment functioning (e.g., critical transitions). We hope that such a grand program of research—based seminally on Werner's (1940/1957) organismic/comparative-developmental theory—will continue to stimulate additional theory and research into a third millennium.

REFERENCES

Apter, D. (1976). *Modes of coping with conflict in the presently inhabited environment as a function of plans to move to a new environment.* Unpublished master's thesis, Clark University, Worcester, MA.

Aronson, E., Ronayne, M., Hayaki, J., & Demick, J. (1994, April). *Adopted does not mean seeing the world through rose-colored glasses.* EPA annual meeting, Providence, RI.

Bertini, G., & Wapner, S. (1992). *Automobile seat belt use in Italy prior to and following legislation.* Unpublished study, Clark University, Worcester, MA.

Blair, S. E. E., (2000). he centrality of occupation during life transitions. *British Journal of Occupational Therapy, 63*(5), 231–237

Chea, W. E., & Wapner, S. (1995). Retrospections of Bahamians concerning the impact of hurricane Andrew. In J. L. Nasar, P. Granis, & K. Hanyu (Eds.), *Proceedings of the twenty-sixth annual conference of the Environmental Design Research Association* (pp. 87–92). Oklahoma City, OK: Environmental Design Research Association.

Ciottone, R., Demick, J., Pacheco, A., Quirk, M., & Wapner, S. (1980, November). Children's transition from home to nursery school: The integration of two cultures. American Association of Psychiatric Services for Children annual meeting, New Orleans, LA.

Clark, E. F. (1995). *Women's self-reported experience and action in relation to protection against sexual transmission of HIV: A randomized comparison study of those interventions.* Doctoral dissertation, Clark University, Worcester, MA.

Cohen, S. B., Wapner, S., Pruginin, A., & Dandonoli, P. (1974). The process of adaptation to a new environment: Israel. Working notes.

Collazo, J. (1985). Transition from health to illness: Experiential changes following the onset of diabedes. Paper presented at the Eastern Psychological Association annual meeting, Boston, MA.

Dandonoli, P., Demick, J., & Wapner, S. (1990). Physical arrangement and age as determinants of environmental representation. *Children's Environments Quarterly, 7*(1), 28–38.

Demick, J., & Wapner, S. (1980). Effects of environmental relocation on members of a psychiatric therapeutic community. *Journal of Abnormal Psychology, 89,* 444–452.

Demick J., & Wapner, S. (1988a). Open and closed adoption: A developmental conceptualization. *Family Process, 27,* 229–249.

Demick, J., & Wapner, S. (1988b). Children-in-environments: Physical, interpersonal, and sociocultural aspects. *Children's Environments Quarterly, 5*(3), 54–62.

Demick, J. (1993). Adaptation of marital couples to open versus closed adoption: A preliminary investigation. In J. Demick, K. Bursik, & R. DiBiase (Eds.), *Parental development* (pp. 175–201). Hillsdale, NJ: Lawrence Erlbaum Associates.

Demick, J. (1993). Parental development: Future research directions. In J. Demick, K. Bursik, & R. DiBiase (Eds.), *Parental development* (pp. 243–270). Hillsdale, NJ: Lawrence Erlbaum Associates.

Demick, J., Inoue, W., Wapner, S., Ishii, S., Minami, H., Nishiyama, S., & Yamamoto, T. (1992). Cultural differences in impact of governmental legislation: Automobile safety belt usage. *Journal of Cross-Cultural Psychology, 23*(4), 468–487.

Demick, J., Peicott, J., & Wapner, S. (1985, August). *Temporal changes in hospitalized alcoholics' self-world relations*. APA annual meeting, Los Angeles, CA.

Des Lauriers, A. (1962). *The experience of reality in childhood schizophrenia*. New York: International Universities Press.

DiLallo, M., Pinet, M., Lamb, J., & Demick, J. (2001). Young adults' attitudes toward infertility, reproductive technology, and adoption. Poster presented at the biennials meetings of the Society for Research in Child Development, Minneapolis, MN.

Duck, S. W., & Sants, H. K. A. (1983). On the origin of the specious: Are personal relationships really interpersonal states? *Journal of Social and Clinical Psychology, 1*, 27–41.

Edelman, E., Rierdan, J., & Wapner, S. (1977). Linguistic representation of a macro-environment under three communication conditions. *Environment and Behavior, 9*, 417–433.

Ferguson, E., Wapner, S., & Quirk, M. (1993, April). Sexual behavior in relation to protection against transmission of HIV in college students. Paper presented at the Eastern Psychological Association annual meeting, Arlington VA.

Graber, J. A., & Brooks-Gunn, J. (1996). Transitions and turning points: Navigating the passage from childhood through adolescence. *Developmental Psychology, 32*, 4 (768–776).

Kaplan, B., Pemstein, D., Cohen, S.B., & Wapner, S. (1974). A new methodology for studying the processes underlying the experince of a new environment: Self—observation and group debriefing. Working notes.

Maslow, A. H. (1946). Problems-centering versus means-centering in science. *Philosophy of Science, Vol. 13*, 326–331.

Nair, P. J. (1961). *Distancing: The application of a developmental construct to learning disability*. Doctoral dissertation, Clark University, Worcester, MA, Microfilm No. AAG8825801.

Redondo, J. P., Pacheco, A. M., Cohen, S. B., Kaplan, B, & Wapner, S. (1981). Issues and Methods in Environmental transtion: Exemplar from Puerto Rican migration. *Revista Review Interamericana, 11*, 376–386.

Roelke, D. T. (1989). *A comparison of close and non-close friendship: Shared worlds and contributions to social support*. Doctoral dissertation, Clark University, Worcester, MA.

Roelke, D. T. (1993). Essential relationships: The shared worlds of friendship. In J. Demick, K. Bursik, & R. DiBiase (Eds.), *Parental development* (pp. 119–133). Hillsdale, NJ: Erlbaum.

Schlossberg, N. (1984). *Counseling adults in transition: Linking practice with Theory*. New York: Springer.

Schouela, D. A., Steinberg, L. M., , Leveton, L. B. & Wapner, S. (1980). Development of the cognitive organization of an environment. *Canadian Journal of Behavioral Science*, 12, 1–16.

Silverstein, D., & Demick, J. (1994). Toward an organizational-relational model of open adoption. *Family Process, 33*(2), 111–124.

Soparkar, K., Demick, J., Levin, R., & Wapner, S. (1988, April). Community attitudes toward open versus closed adoption. EPA annual meeting, Buffalo, NY.

Thomason, D. L. (1985). A developmental analysis of friendship. Master's thesis, Clark University, Worcester, MA.

Wapner S., & Cirillo, L. (1973). Development of planning. (Public Health Service Grant Application). Clark University, Worcester, MA.

Wapner, S., & Demick, J. (1998). Developmental analysis: A holistic, developmental, systems-oriented perspective. In W. Damon (Series Ed.) & R. M. Lerner (Vol. Ed.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (5th ed., pp. 761–805). New York: Wiley.

Wapner, S., & Demick, J. (1999). Developmental theory and clinical practice: A holistic, developmental, systems-oriented approach. In W. K. Silverman & T. H. Ollendick (Eds.), *Developmental issues in the clinical treatment of children* (pp. 3–30). Boston: Allyn & Bacon.

Wapner, S., & Demick, J. (2000a). Person-in-environment psychology: A holistic, developmental, systems-oriented perspective. In W. B. Walsh, K. H. Craik, & R. H. Price (Eds.), *Person-environment psychology: New directions and perspectives* (2nd ed., pp. 25–60). Hillsdale, NJ: Erlbaum.

Wapner, S., & Demick, J. (2000b). Assumptions, methods, and research problems of the holistic, developmental, systems-oriented perspective. In S. Wapner, J. Demick, T. Yamamoto, & H. Minami (Eds.),

Theoretical perspectives in environment-behavior research: Underlying assumptions, research problems, and methodologies (pp. 7–19). New York: Kluwer Academic/Plenum.

Wapner, S., & Demick, J. (in press), The Increasing Context of Context: Toward a More Comprehensive Study of Environment Behavior Relations. To appear in: R. B. Bechtel, & A. Churchman (Eds.). (in preparation). *The new environmental psychology handbook*. New York: Wiley.

Wapner, S. (1983). Living with radical disruptions of person-in-environment systems. *IATSS Review, 9*(2). (In Japanese. English translation available.)

Wapner, S., & Demick, J. (1998). Developmental analysis: A holistic, developmental, systems-oriented perspective. In W. Damon (Series Ed.) & R. M. Lerner (Vol. Ed.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (5th ed., pp. 761–805). New York: Wiley.

Wapner, S., Kaplan, B. & Cohen, S. B. (1973). An organismic-developmental perspective for understanding transactions of men in environments. *Environment and Behavior, 5*, 255–289.

Werner, H. (1937). Process and achievement: A basic problem of education and developmental psychology. *Harvard Educational Review, 7*, 353–368.

Werner, H., & Kaplan, B. (1963). *Symbol formation*. New York: Wiley.

Werner, H, & Wapner, S. (1952). Experiments on sensory-tonic field theory of perception: III. Effect of initial position of a rod on apparent verticality. *Journal of Experimental Psychology, 43*, 68–75.

Werner, H. (1940/1957). *Comparative psychology of mental development*. New York: International Universities Press.

Wofsey, E., Rierdan, J., & Wapner, S. (1979). Planning to move: Effects on representing the currently inhabited environment. *Environment and Behavior, 11*, (3–32).

17

THE PRIMATE PHYLOGENY OF COGNITIVE ONTOGENY

Jonas Langer

How did human cognitive development evolve? To study the phylogeny of human cognitive ontogeny we are investigating the comparative origins and development of cognition in five modern primate species. The species we are studying are humans plus two great ape and two monkey species. The cognitive developments we are studying in these species are their logico-mathematical and physical knowledge.

Logico-mathematical cognition is knowledge about necessary relations that are not conditioned or dependent upon circumstances. They comprise necessary qualitative (e.g., class) and quantitative (e.g., numerical) relations. Their key development includes progressively constructing knowledge about the certainty of these and only these kinds of relations. Developing knowledge of quantitative equivalence relations by commutativity is paradigmatic (e.g., knowing that spatially rearranging objects necessarily conserves their quantity).

Physical cognition, on the other hand, is knowledge about contingent relations that are conditioned or determined by circumstances. They comprise causal, spatial, temporal and object relations. Their key development includes progressively constructing knowledge about the contingency of these kinds of relations. Developing knowledge that causal relations are probabilistic is paradigmatic (e.g., knowing that using one billiard ball to launch another is contingent upon whether they collide spatially).

Accordingly, the method we used to study the comparative cognitive development of primates measured their *spontaneous constructive interactions* with sets of objects (see Langer, 1980, Appendix, for detailed specifications on the method). The range of objects presented spans geometric shapes to realistic things such as cups.

No instructions were given and no problems were presented to the subjects. They were simply allowed to play freely with the objects as they wished because the goal was to study their developing constructive intelligence. Class structures were embodied by some of the object sets presented, e.g., multiplicative classes such as a yellow and green cylinder and a yellow and a green triangular column. But even with these class-embodying sets of objects there was nothing in the procedures that required subjects to do anything about the objects' class structures.

Many of the findings on children (Langer, 1980, 1986) that I will review have been replicated with both Aymara and Quecha Indian children in Peru, ages 8 to 21 months (Jacobsen, 1984). The Indian children were raised in deeply impoverished conditions as compared to the mainly Caucasian middle class San Francisco Bay Area children in my samples. Many of the findings have also been replicated with 6- to 30-month-old infants exposed *in utero* to crack cocaine (Ahl, 1993). No differences were found in onset age, velocity, sequence, extent, or organization of cognitive development during infancy in these different human samples. Most comparisons of primate cognitive development in the next sections are based on these studies of human children and on parallel studies of capuchins (*Cebus apella*), macaques (*Macaca fascicularis*) and chimpanzees (*Pan troglodytes* and *Pan paniscus*) using the same nonverbal and nondirective methods used to study human children's spontaneous cognitive constructions.

THE PHYLOGENETIC ROOTS OF COGNITIVE ONTOGENY

Like other evolutionary phenomena, cognitive development's ultimate causal roots are phylogenetic. Its proximate causal roots are ontogenetic. Thus, the foundations of human cognitive ontogeny are expected to concord with its primate phylogeny. Nevertheless, human mental development does not recapitulate its primate phylogeny (Werner, 1948). Instead, the evolution of primate cognitive development is heterochronic (e.g., Langer, 1989, 1996; see Gould, 1977, and McKinney & McNamara, 1991, on heterochronic mechanisms of evolution). In particular, I have hypothesized that its phylogeny is marked by temporal displacements in the ontogenetic covariation between logicomathematical and physical cognitions. I will return to considering the heterochronic evolution of primate cognitive development in the conclusion.

Two opposing classical hypotheses have been proposed about the temporal displacements in the primate evolution of ontogeny, in general, and of cognitive development, in particular. One hypothesis is that the evolution is neotenous or progressively retarded (e.g., Bjorklund, 1997; Gould, 1977, 1984; Montague, 1989). Neoteny implies infantilization of human ontogeny caused by a slower rate of development. The other hypothesis is that the evolution is precocial or progressively accelerated (e.g., McKinney & McNamara, 1991; Parker & McKinney, 1999). Precociality implies adultification of human ontogeny caused by a faster rate of development.

On both hypotheses, human cognitive ontogeny concords with its primate phylogeny subject to two modifications. Developmental velocity increases or decreases. But, significantly, on both hypotheses the extent of cognitive development progresses in phylogeny. Directionality of cognitive evolution and development is inherent in both hypotheses.

I agree that they are directed processes but with two stipulations. First, directional processes are statistical not deterministic. Cognition is a dynamic open, not a predetermined system. Human cognition is but a stage in the evolution and history of ideas. Still, as James Mark Baldwin (1896, 1902, 1915) already hypothesized, ontogeny provides the vital impulse for mental as well as biological novelty. Ontogeny provides the permanent cognitive possibilities or variations for future intellectual evolution and history. The second stipulation is that theses nondeterministic directional processes are governed by the orthogenetic principle of increasing differentiation and hierarchic integration (Werner, 1948; Werner & Kaplan, 1963; see Langer, 1970, for further specifications).

I have proposed a third alternative hypothesis about the temporal displacements in the primate evolution of ontogeny that encompasses their behavioral and physiological development (e.g., Langer, 2000a). Unlike the two classical hypotheses, I differentiate between cognitive and noncognitive behavioral development, on the one hand, and between brain and nonbrain physiological maturation, on the other hand. The hypothesis is that human brain and cognitive development are precocial while their non-brain physiological and non-cognitive behavioral development are neotenous (e.g., Langer, 2000a, b).

In the next section I will outline our findings on the precocial human development of logico-mathematical cognition. In the subsequent section I will outline findings on humans' comparatively precocial development of physical cognition. All the findings are consistent with Werner's proposal that humans' mental development is comparatively plastic:

> The level of animal mentality is relatively fixed or rigid, compared with that of the child mentality which is in a continual process of change. The difference in plasticity of development comes clearly into view in a comparison of various ontogeneses in the animal and the human sphere. That is, the epoch of plasticity in any form of life appears—ceteris paribus—of longer duration and richer in content, the higher the species. (Werner, 1948, pp. 29 & 30)

The comparative findings on humans' precocial cognitive development also fit with the comparative findings on humans' precocial brain maturation (e.g., Deacon, 2000). The human brain is already larger than that of other primate species at birth, as measured by the log encephalization quotient or the fraction of the body devoted to brains. Maturation of the human brain extends into young adulthood, a later offset age than for other primate species (e.g., Gibson, 1990, 1991; Purves, 1988). This includes comparatively prolonged glial cell growth, myelination, synaptogenesis, and dendritic growth in the cortex. The result is great expansion of the human brain especially in the neocortex (e.g., Deacon, 2000; Finlay & Darlington, 1995).

Consistent with its precocial and extended brain ontogeny, the onset age of human cognitive development, we will see, is comparatively early. The offset age is comparatively late. The offset age of both logicomathematical and physical cognitive development is between ages 25 and 30 years in humans (Kuhn, Langer, Kohlberg, & Haan, 1977). Comparatively, the offset age of logicomathematical cognitive development is no more than age 6 years in bonobo and common chimpanzees (Potí, Langer, Savage-Rumbaugh & Brakke, 1999; Spinozzi, Natale, Langer & Brakke, 1999). The most likely hypothesis at this point, but for which we do not yet have definitive data, is that the developmental offset age of their physical cognition is around age 5 years.

Thus, evolution has provided humans with the most ontogenetic time and speed to develop the brain and cognition most extensively. As outlined in the following sections, compared to other primates, human cognitive development is predominantly precocious, its velocity is accelerated, and its terminus is delayed and extended. At the same time, human non-brain physiological maturation (see, e.g., Smith, 1992) and attendant non-cognitive behavioral development, such as locomotion and dependence, is predominantly neotenous (e.g., Werner, 1948). This is, in part, why I have proposed that humans' ontogenetic "window of opportunity" for cognitive development is wider than chimpanzees' which is wider than monkeys' (see, e.g., Langer, 2000a, b, for elaboration).

PRECOCIAL HUMAN DEVELOPMENT OF LOGICOMATHEMATICAL COGNITION

Elucidating human's precocial logical cognition requires outlining in some detail our findings on the comparative primate development of classifying objects. Then I will illustrate human precocial arithmetic cognition by only briefly outlining our findings on the comparative primate development of quantitative exchange and correspondence operations. (See the references given for full accounts of our varied and numerous findings on both logical and arithmetic cognition.)

Classifying Objects

All primate species compose class-consistent sets of objects (Langer, 1980, 1986, 1990; Spinozzi, 1993; Spinozzi & Langer, 1999; Spinozzi & Natale, 1989; Spinozzi, Natale, Langer & Brakke, 1999; Spinozzi, Natale, Langer & Schlesinger, 1998). But the onset and offset ages, sequence, extent, and rate of the classificatory development diverges between species.

Human Infants

Human infants begin by constructing class-consistent single sets. They construct the sets consecutively so that they do not overlap temporally with each other. The sequence of their development begins with infants consistently composing

consecutive single sets of *different* objects when presented with two contrasting classes of two objects (e.g., two identical circular rings and two identical triangular rings). For example, 6-month-olds consistently pair circles with triangles, rather than circles with circles or triangles with triangles.

At ages 8 and 10 months, infants no longer consistently compose sets of objects from different classes with each other. Instead, their compositions are *random*. Thus, for example, 8- and 10-month-olds are equally likely to pair circles with triangles as they are to pair circles with circles and triangles with triangles.

By age 12 months, infants begin to compose sets of *identical* objects with each other (e.g., red circles with red circles). Varying procedures and analyses by Grigorakis (1999), Nelson (1973), Riccuiti (1965), Starkey (1981), and Sugarman (1983) yield comparable results on classifying by identities at age 12 months.

By age 15 months, infants begin to compose consistently *similar* (e.g., red with blue circles) as well as identical (e.g., red with red circles) objects with each other. As in other studies, we have found that infants extend first-order composing by similarities and identities to larger single sets during their second year.

In this entire four-stage developmental sequence, infants compose only one category with one class property at a time. I therefore call this first-order classifying. This structure is what differentiates these four sequential developments in first-order classifying from second-order classifying. Second-order classifying originates at age 18 months (as also found by e.g., Nelson, 1973; Riccuiti, 1965; and Sugarman, 1983). Then infants begin consistently to compose two temporally overlapping categories.

Second-order classifying develops in two stages. In the first stage, at age 18 months, the objects composing each category are *identical* but the objects in the two categories are *different*. For example, they may construct two temporally overlapping groupings in which one comprises red circles and the other comprises blue circles. The second stage develops by age 24 months when infants also consistently compose two temporally overlapping categories in which the objects in each category are *similar* but the objects in the two categories are *different*. For example, they may construct two temporally overlapping groupings in which one comprises red and blue circles and the other comprises red and blue triangles. Thus, second-order classifying means composing two categories and two class properties at the same time. Third-order classifying develops in early childhood (as also found by Denney, 1972, using different procedures). Then children begin consistently to compose three temporally overlapping categories.

Monkeys

Classificatory development takes a different sequential path in capuchins and macaques. Moreover, its extent does not progress beyond first-order classifying. Second-order classifying is precluded because monkeys do not compose two temporally overlapping sets. The limited elements that monkeys can construct—single sets—constrains the progress of their cognitive development to first-order operations. Hence, monkeys do not develop second-order classifying.

Even within their more limited extent, the rate and sequence of developing first-order classifying is different in monkeys than in humans. In fact, it is different in different monkey species—that is, capuchins and macaques—even though all primates end up by classifying by identities and similarities. To illustrate the formal differences with human development, consider capuchins. They begin by mostly *random* classifying at age 16 months, shift to mostly classifying by *differences* by age 36 months, and finally shift to classifying by *identities* and *similarities* but not until age 48 months.

Most notable for our purposes is monkeys' comparative cognitive developmental retardation. The onset age of their extremely limited development of classificatory cognition is severely delayed. Its developmental velocity is much slower. And its offset age is much later.

Chimpanzees

Chimpanzees' classificatory development progresses to an intermediate level between that of monkeys' and human infants'. Chimpanzees develop rudimentary second-order classifying. Moreover, the sequence of their development is in the same order as in human infants. This includes the four-stage sequence of first-order classifying development and the two-stage sequence of second-order classifying development. However, its extent is limited to two-category classifying while humans' progress extends to three-category classifying and beyond (e.g., hierarchic class systems that require a minimum of three categories).

The velocity of chimpanzees' classificatory development is slower than humans' but faster than monkeys'. On the one hand, for example, the offset age of their first-order classifying is 30 months while humans' is 15 months and capuchins' is 48 months. On the other hand, the onset age of chimpanzees' second-order classifying is not until 51 months while humans' is only 18 months.

Exchange and Correspondence Operations

Arithmetic constructions complement logical constructions, such as the just-described classifying, in all primate species (Langer, 1980, 1986, 1989, 1990; Potí, 1997; Potí & Antinucci, 1989; Potí & Langer, 2001; Potí, Langer, Savage-Rumbaugh & Brakke, 1999). For instance, all primates construct aspects of exchange and correspondence operations that create equivalence and nonequivalence relations. Exchange includes commuting, replacing, and substituting. I will only illustrate substituting that creates equivalence relations.

Human Infants

As already noted, human infants consistently compose two objects into single sets by age 6 months. Some also already recompose these single sets by substituting objects (i.e., by taking away one object and substituting another object in its place). Thereby, these 6-month-olds already construct equivalence within single sets. These are first-order cognitive constructions because they comprise one

substituting operation to produce one equivalence relation in one element, a single set of objects only.

By age 10 months, all infants construct equivalence relations by substituting in single two-object sets. During their second year, infants construct equivalence relations in ever larger sets by first-order substituting operations. For instance, by age 18 months half of them already substitute in four-object sets. All first-order exchange operations, including substituting, are limited to producing relations, such as equivalence, within single sets that are not related to any of infants' other constructions.

The major development in infants' arithmetic constructions during their second year is the origins of second-order operations. Second-order operations integrate first-order operations with each other by mapping operations onto each other. Mapping operations onto each other produces a second level of more powerful arithmetic relations, such as equivalences upon equivalences. By this recursive procedure, older infants begin to construct hierarchically integrated cognitive operations.

By age 24 months, all infants compose two very small sets in relation to each other that overlap in time. All infants also match such compositions by one-to-one correspondence between the objects that result in equivalence relations between the two sets. To illustrate, infants may construct two stacks of three objects. Some infants transform these corresponding sets by substituting the top objects for each other. They preserve the equivalence relation between the two sets while transforming them. Thereby, they construct equivalence upon equivalence relations by mapping substitution operations upon correspondence operations. By mapping their operations onto each other infants begin to construct second-order hierarchic arithmetic as well as logical cognitions. The formation of second-order hierarchic cognition by mapping mappings onto mappings is a key feature of recursive cognitive development that I will return to later.

Monkeys

The comparative primate picture that is emerging on their developing arithmetic cognition is similar to that outlined for their logical cognition. Capuchin and macaque monkeys develop first-order arithmetic cognitions. Again, the onset age, circa 16 months, is much later than in human infants. This includes producing equivalence relations in single sets by substituting. Moreover, the extent is very limited; it rarely exceeds substituting in two-object sets. So even the extent of monkeys' first-order cognition is already much less than that in human infants. Further, these monkey species do not seem to develop any second order arithmetic cognition. As with logical cognition, this is not possible since they do not construct the requisite minimal elements of two temporally overlapping sets.

Chimpanzees

Chimpanzees, we have already seen, do construct temporally overlapping sets. Unlike monkeys and like humans, chimpanzees also develop second-order arithmetic cognitions. However, the extent of its development is comparatively

limited, approximating the level of second-order operations of 15- to 18-month-old human infants and only beginning when chimpanzees are already in their fifth year. So their rate of developing arithmetic cognition is much slower and their onset age is much later.

Precocial Human Development of Physical Cognition

Developing logicomathematical cognition is comparatively early, accelerated and extended in human ontogeny, as outlined in the previous section. Our illustrative example of classificatory development is paradigmatic. For instance, we saw that capuchins do not complete their development of first-order classifying until age 48 months. In comparison, it is already developed by age 15 months in humans. So too, while common chimpanzees' development extends to rudimentary second-order classifying, it does not originate until age 51 months. In comparison, it originates at age 18 months in humans. This pattern of accelerated logicomathematical cognitive development in humans fits with the hypothesis that it is precocial, and not neotenous.

To compare primates' developing logicomathematical cognition I used absolute age as the scale. Then, humans' velocity is approximately three times as rapid as that of common chimpanzees. This underestimates the actual difference. The more appropriate comparative scale is relative age that takes into account each species' life span. To illustrate, humans live about twice as long as common chimpanzees (e.g., Smith, 1992). Thus, humans' velocity of developing logicomathematical cognition is actually more like six times as rapid as that of common chimpanzees.

Nonhuman primates develop their physical cognition much more rapidly than their logico-mathematical cognition (Langer, 1993). This is vividly illustrated by the physical cognition for which the most comparative developmental data are available, object permanence. Consider its comparative primate onset age first.

Human infants already begin to construct knowledge about the existence and causal relations of objects in space and time. The earliest symptoms are newborns' sensorimotor activity, e.g., tracking objects and hand sucking. These activities maintain contact with objects; thereby constituting stage 1 of Piaget's (1952, 1954) 6-stage sequence of object permanence development during infancy.

Comparative research has paid relatively little attention to the onset age of physical cognition. Still, it has already discovered the earliest symptoms of stage 1 object permanence during their first week in macaques (*Macaca fuscata* and *fascicularis*; Parker, 1977; Potí , 1989), second week in capuchins (*Cebus appela*; Spinozzi, 1989), and fifth week in gorillas (*Gorilla gorilla gorilla*; Redshaw, 1978; Spinozzi & Natale, 1989). These limited data suggest no or very little difference between human and nonhuman primates in the onset age for developing object permanence. A fairly secure estimate would put the onset age in the neonatal to early infancy range in all anthropoid primates.

Consider now a representative finding on the comparative velocity of object permanence development. Young capuchins develop to their most advanced level of object permanence, stage 5 (presentational or here-and-now object knowledge) in Piaget's 6-stage sequence by age 7 months (Natale, 1989). In contrast, young capuchins do not develop to their most advanced level of logico-mathematical cognition, such as single category classifying by identify and similarity, until their fourth year. So, capuchins' velocity of developing physical cognition is accelerated greatly in comparison to their logico-mathematical cognition.

While developing much more rapidly than their logicomathematical cognition, capuchins' physical cognition still develops more slowly than humans' physical cognition. Human infants develop stage 5 object permanence by around age 10 months (e.g., Paraskevopoulous and Hunt, 1971; Piaget, 1954; see Langer, Rivera, Schlesinger & Wakeley, in press, for a review). Factoring in the approximately three times longer human than capuchin life span (e.g., Smith, 1992) reveals that the developmental velocity is about doubled in humans.

This is the general pattern for all physical cognition (including space and causality, as well as objects) for which comparative developmental data are available (which includes macaques, gorillas and chimpanzees, as well as capuchins; Parker and McKinney, 1999). The velocity of developing physical cognition is comparatively accelerated in human versus nonhuman primate ontogeny even though its onset age is not earlier as it is for logicomathematical cognition. Thus, while not as rapid an acceleration as it is for their developing logicomathematical cognition, humans' developing physical cognition is certainly not neotenous.

THE DEVELOPMENT OF HIERARCHICALLY INTEGRATED COGNITION

Key to Werner's (1948) comparison between different developmental series, including the phylogeny and ontogeny of mental development, was determining the genetic parallels between them. For Werner this meant determining the formal similarities and material differences between them. As illustrated above our research seeks to determine the formal differences (e.g., in the onset ages of logicomathematical cognition such as classifying in primate phylogeny) as well as the formal similarities (e.g., in the onset ages of physical cognition such as object permanence in primate phylogeny).

A vital formal difference between primate species we have found is in their ability to compose objects into sets. Up to at least age 4 years, capuchins and macaques are limited to constructing single sets of up to three objects (Spinozzi & Natale, 1989). Human infants already begin to exceed these limits by constructing two contemporaneous sets of increasingly numerous objects in their second year (Langer, 1986). The comparative consequence is that capuchins and macaques are locked into developing no more than elementary first-order cognitions, while progressive possibilities open up for children to map new and more advanced

cognitions. For instance, as we have already seen, young capuchins and macaques are limited to constructing single-category classifying while human infants already begin to construct two-category classifying by age 18 months.

Young chimpanzees, like human infants and unlike young monkeys, construct two contemporaneous sets as elements of their cognition. Unlike monkeys they are therefore not limited to developing first-order cognitions, such as single-category classifying. Instead, like human infants, young chimpanzees begin to develop more complex second-order cognitions, such as two-category classifying, but not until their fifth year. However, chimpanzees remain basically limited to composing two contemporaneous sets even as adults (Potí, Langer, Savage-Rumbaugh & Brakke, 1999; Spinozzi, Natale, Langer & Brakke, 1999). In their second year, human infants already begin to compose multiple contemporaneous sets (Langer, 1986). As a consequence, chimpanzees are constrained to constructing no more than two-category classifying (Spinozzi, 1993; Spinozzi, Natale, Langer & Brakke, 1999). Human infants already begin to develop three-category classifying during their third year.

This is a vital divergence in the cognitive development attainable by chimpanzees and humans. It determines whether hierarchically integrated cognition is possible. For example, three-category classifying opens up the possibility of hierarchization while two-category classifying does not permit anything more than linear cognition. Minimally, hierarchic inclusion requires two complementary subordinate classes integrated by one superordinate class. Thus, during their third year human infants already open up the possibility of hierarchization. Chimpanzees do not. They remain limited to linear cognition.

Another crucial extension in their potential intellectual development is that human infants already begin to map their cognitive operations onto each other. Only transitional mappings of operations onto operations are constructed by bonobos up to at least adolescence and by common chimpanzees up to adulthood (Potí, 1997; Potí, Langer, Savage-Rumbaugh & Brakke, 1999). To illustrate, towards the end of their second year, human infants begin to compose two sets of objects in spatial and numerical one-to-one correspondence; then they exchange equal numbers of objects *between* the two sets such that they preserve the spatial and numerical correspondence between the two sets (Langer, 1986). These infants map exchange operations onto their correspondence operations. Thereby, they produce equivalence upon equivalence relations. In comparable conditions, chimpanzees only exchange equal numbers of objects *within* one of two corresponding sets that they have constructed, thereby preserving their equivalence relations (Potí et al., 1999).

Thus, only the cognition of human infants among young primates becomes fully recursive. Recursiveness, I have proposed, is a key to changing the rules of cognitive development (Langer, 1986, 1994, 1996). It further opens up possibilities for transforming linear into hierarchic cognition.

Recursive development drives progressive change in the relation between the forms and contents of cognition. This opens up possibilities for transforming forms (structures) into contents (elements) of cognition. Initial simple linear cognitions (e.g., minimal classifying) become potential elements of more advanced hierarchic

cognitions (e.g., comprehensive taxonomizing). On this view, recursive cognitive development is a precondition for the formation of all reflective cognition which requires hierarchization. Linear cognition is not sufficient.

With the formation of hierarchic cognition, the referents of human infants' intellectual operations are no longer limited to objects. Cognition is no longer limited to the concrete. Progressively, the referents of infants' cognitions become relations, such as numerical equivalence and causal dependency. These nascent relations are products of other intellectual operations infants previously mapped onto objects. By mapping operations onto relations previously constructed, infants' intelligence is becoming abstract and reflective or thoughtful.

THE HETEROCHRONIC PHYLOGENY OF PRIMATE COGNITIVE ONTOGENY

Striking species divergences in the organization of developmental sequencing between physical and logicomathematical cognition mark primate phylogeny. Physical and logico-mathematical cognition develop in parallel in humans. The onset age is the same, very early infancy and probably the neonatal period. They also develop in synchrony. Neither type of cognition begins or ends before the other during childhood. Consequently, both forms of cognition are open to similar environmental influences and to each other's influence.

The other extreme, almost total asynchrony between their development of physical and logico-mathematical cognition, is found in capuchins and macaques. To illustrate, capuchins complete their development of object permanence (up to Piaget's stage 5) during their first year (Natale, 1989) and only begin to develop classifying during their second year (Spinozzi & Natale, 1989; Potí & Antinucci, 1989). Since they are out of developmental phase with each other, capuchins' and macaques' physical and logicomathematical cognitions are not likely to be open to similar environmental influences and to each other's influence.

Physical and logico-mathematical cognition constitute partially overlapping developmental trajectories in chimpanzees' ontogeny. Chimpanzees' development of their physical cognition is not completed before the onset of their logico-mathematical cognition. Physical and logico-mathematical cognition constitute partially asynchronic developmental trajectories. Therefore, these two cognitive domains may begin to be partially open to similar environmental influences and to each other's influence relatively late in ontogenesis.

Physical and logico-mathematical cognition constitute contemporaneous developmental trajectories that become progressively interdependent from the start of human ontogeny. Synchronic developmental trajectories permit direct interaction or information flow between cognitive domains. Mutual and reciprocal influence between logico-mathematical and physical cognition is readily achievable since humans develop them simultaneously and in parallel. To illustrate infants' logico-mathematical cognition already introduces elements of necessity and certainty into

their physical cognition; and their physical cognition introduces elements of contingency and uncertainty into their logical cognition (see Langer, 1985; 1986, for detailed findings).

In primate phylogeny, the unilinear growth trajectory of physical *followed by* logico-mathematical cognition evolved into multilinear growth trajectories of physical *at the same time as* logico-mathematical cognition. The sequential trajectory of physical followed by logico-mathematical cognition in the ontogeny of capuchins and macaques became "folded over" and, hence, concurrent trajectories: (a) first to form descendant partially multilinear development midway in chimpanzee ontogeny; and (b) eventually to form fully multilinear development from the start in human ontogeny.

The onset age for beginning to develop physical cognition is similar in all primates studied so far. The onset age for logico-mathematical cognition is comparatively retarded in monkeys. Its development does not overlap with the development of physical cognition. The onset age for logico-mathematical cognition is partially accelerated in chimpanzees. Its development partly overlaps with the development of physical cognition. The onset age for logico-mathematical cognition is accelerated in humans. It becomes contemporaneous with the onset age of physical cognition.

Phylogenetic displacement in the ontogenetic onset and offset ages plus the velocity of one cognitive developmental trajectory relative to another within the same organism causes a disruption in the repetition of phylogeny in ontogeny. Such heterochronic displacement involves a dislocation of the phylogenetic order of succession. It produces a change in the onset and offset ages and the velocity of ancestral processes. The onset and velocity may be accelerated or retarded. But, importantly, we have seen, in human as compared to nonhuman primates the onset age and velocity of developing logicomathematical cognition is accelerated and the offset age is extended. And importantly, while the offset age of physical cognition is extended, only its developmental velocity is accelerated in human as compared to nonhuman primates. The onset age is similar.

The comparative data on the organization of and sequencing between cognitive domains are consistent with the hypothesis that heterochrony is a mechanism of the evolution of primate cognitive development. Heterochronic displacement is a mechanism whereby consecutively developing ancestral cognitive structures were transformed in phylogenesis into simultaneously developing descendant cognitive structures in human ontogenesis. Heterochrony produced the reorganization of nonaligned ancestral cognitive structures in capuchins and macaques into the partly aligned descendant structures in chimpanzees and the fully aligned descendant structural development of cognition in human infancy.

This reorganization opened up multiple cascading possibilities for full information flow between logico-mathematical (e.g., classificatory) and physical (e.g., causal) cognition in human infancy (e.g., making it possible to form a "logic of experimentation"). These cognitive domains are predominantly segregated from each other in time and, therefore, in information flow in the early development of

capuchins and macaques. They are partially segregated from each other in time and, therefore, in information flow in the early development of common chimpanzees.

The possibilities opened up for further development vary accordingly and, I have proposed (e.g., Langer, 2000a, b) reciprocally constrain the direction of progressive cognitive ontogeny in primate phylogeny. Cognitive development is already quite substantial in the youth of capuchins and macaques. However, their asychronic early cognitive development hampers much further progress with age. The partially synchronic and relatively advanced early cognitive development of common chimpanzees multiplies the possibilities for substantial if still limited further progress with age. Human synchronic and still more extensive early cognitive development opens up comparatively unlimited, permanent, unique and cascading possibilities for further intellectual progress.

REFERENCES

Ahl, V. A. (1993). *Cognitive Development in Infants Prenatally Exposed to Cocaine*. Unpublished doctoral dissertation. University of California at Berkeley.

Baldwin, J. M. (1896). A new factor in evolution. *American Naturalist, 30*, 354, 442–451, 536–553.

Baldwin, J. M. (1902). *Development and Evolution*. New York: Macmillan.

Baldwin, J. M. (1915). *Genetic Theory of Reality*. NY: Putnam.

Bjorklund, D. F. (1997). The role of immaturity in human development. *Psychological Bulletin, 122*, 153–169.

Deacon, T. (2000). How flexible is the neurodevelopmental clock? In S. T. Parker, J. Langer & M. L. McKinney (Eds.), *Biology, Brains and Behavior: The Evolution of Human Development*. Santa Fe, NM: School of American Research Press.

Denney, N. (1972). Free classification in preschool children. *Child Development, 43*, 1161–1170.

Finlay, B. L. & Darlington, R. D. (1995). Linked regularities in the development and evolution of mammalian brains. *Science, 268*, 1578–1584.

Gibson, K. R. (1990). New perspectives on instincts and intelligence: Brain size and the emergence of hierarchical mental constructional skills. In S. T. Parker and K. R. Gibson (Eds.), *"Language" and intelligence in monkeys and apes* (pp. 97–128). Cambridge: University Press.

Gibson, K. R. (1991). Myelination and behavioral development: A comparative perspective on questions of neoteny, altriciality and intelligence. In K. R. Gibson & A. C. Petersen (Eds.), *Brain Maturation and Cognitive Development* (pp. 29–63). New York: de Gruyter.

Gould, S. J. (1977). *Ontogeny and Phylogeny*. Cambridge: Harvard University Press.

Gould S. J. (1984). Relationship of individual and group care. *Human Development, 27*, 233–239.

Grigorakis, K. (1999). Numerical architectures in early manipulatory classification. Unpublished Ph.D. thesis, University of California, Berkeley.

Jacobsen, T. A. (1984). *The Construction and Regulation of Early Structures of Logic. A Cross-Cultural Study of Infant Cognitive Development*. Unpublished doctoral dissertation. University of California at Berkeley.

Kuhn, D., Langer, J., Kohlberg, L., & Haan, N. (1977). The development of formal operations in logical and moral judgment. *Genetic Psychology Monographs, 95*, 97–188.

Langer, J. (1970). Werner's comparative organism theory. In Mussen, P.H. (Ed.), *Carmichael's Manual of Child Psychology*. NY:Wiley.

Langer, J. (1980). *The Origins of Logic: Six to Twelve Months*. New York: Academic Press.

Langer, J. (1985). Necessity and possibility during infancy. *Archives de Psychologie, 53*, 61–75.

Langer, J. (1986). *The Origins of Logic: One to Two Years*. New York: Academic Press.

Langer, J. (1989). Comparison with the human child. In F. Antinucci (Ed), *Cognitive Structure and Development of Nonhuman Primates*, (pp. 229–242). Hillsdale, NJ: Erlbaum.

Langer, J. (1990). Early cognitive development: Basic functions. In Hauert, C. A. (Ed.), *Developmental Psychology: Cognitive, Perceptuo-Motor, and Neuropsychological Perspectives* (pp. 19–42). Amsterdam: North Holland.

Langer, J. (1993). Comparative cognitive development. In K. R. Gibson and T. Ingold (Eds.): *Tools, language and cognition in human evolution* (pp. 300–313). Cambridge: University Press.

Langer, J. (1994). From acting to understanding: The comparative development of meaning. In W. F. Overton & D. Palermo (Eds.), *The nature and ontogenesis of meaning* (pp. 191–213). Norwood, NJ: Erlbaum.

Langer, J. (1996). Heterochrony and the evolution of primate cognitive development. In Russon, A. E., Bard, K. A. & Parker, S. T. (Eds.), *Reaching into Thought: The Mind of the Great Apes* (pp. 257–277). Cambridge, MA: Cambridge University Press.

Langer, J. (1998). Phylogenetic and ontogenetic origins of logic: Classification. In J. Langer & M. Killen (Eds.), *Piaget, Evolution and Development* (pp. 33–54). Mahweh, NJ: Erlbaum.

Langer, J. (2000a). The descent of cognitive development. *Developmental Science, 3*, 361–378.

Langer, J. (2000b). The heterochronic evolution of primate cognitive development. In S. T. Parker, J. Langer & M. L. McKinney (Eds.), *Biology, Brains and Behavior: The Evolution of Human Development* (pp. 213–233). Santa Fe, NM: School of American Research Press.

Langer, J., Rivera, S., Schlesinger, M., & Wakeley, A. (2003). Early cognitive development: Ontogeny and phylogeny. In J. Valsiner & K. Connolly (Eds.), *Handbook of Developmental Psychology*. London: Sage.

McKinney, M.L. & McNamara, J.K. (1991). *Heterochrony: The Evolution of Ontogeny*. New York: Plenum.

Montague, A. (1989). *Growing Young*. New York: McGraw-Hill.

Natale, F. (1989). Causality II: The stick problem. In Antinucci, F. (Ed.), *Cognitive Structure and Development in Nonhuman Primates* (pp. 121–133). Hillsdale: Erlbaum.

Nelson, K. (1973). Some evidence for the primacy of categorization and its functional basis. *Merrill-Palmer Quarterly, 19*, 21–39.

Paraskevopoulous, J. & Hunt, J. McV. (1971). Object construction and imitation under different conditions of rearing. *Journal of Genetic Psychology, 119*, 301–321.

Parker, S. T. (1977). Piaget's sensorimotor series in an infant macaque: A model of comparing unstereotyped behavior and intelligence in human and nonhuman primates. In S. Chevalier-Skolnikoff & F. E. Poirier, (Eds.), *Primate Bio-social Development: Biological, Social, and Ecological Determinants*, pp. 43–112. NYC: Garland.

Parker, S. T. & McKinney, M. L. (1999). *Origins of Intelligence: The Evolution of Cognitive Development in Monkeys, Apes, and Humans*. Baltimore: Johns Hopkins University Press.

Piaget, J. (1952). *The Origins of Intelligence in Children*. New York: International Universities Press.

Piaget, J. (1954). *The Construction of Reality in the Child*. New York: Basic Books.

Potí, P. (1989). Early sensorimotor development in Macaques. Antinucci, F. (Ed.), *Cognitive Structure and Development of Nonhuman Primates* (pp. 39–53). Hillsdale, NJ: Erlbaum.

Poti, P. (1997). Logical structures in young chimpanzees' spontaneous object grouping. *International Journal of Primatology, 18*, 33–59.

Potí, P. & Antinucci, F. (1989). Logical operations. In F. Antinucci (Ed.), *Cognitive Structure and Development of Nonhuman Primates* (pp. 189–228). Hillsdale, NJ: Erlbaum.

Potí, P., & Langer, J. (2001). Spontaneous spatial constructions by chimpanzees (*Pan troglodytes, Pan paniscus*). *Developmental Science, 4*, 474–484.

Poti, P., Langer, J., Savage-Rumbaugh, E. S. & Brakke, K. E. (1999). Spontaneous logicomathematical constructions by chimpanzees (*Pan troglodytes, Pan paniscus*). *Animal Cognition, 2*, 147–156.

Purves, D. (1988). *Body and Brain: A Trophic Theory of Neural Connections*. Cambridge, MA: Harvard University Press.

Redshaw, M. (1978). Cognitive development in human and gorilla infants. *Journal of Human Evolution; 7*, 133–141.

Riccuiti, H. N. (1965). Object grouping and selective ordering behavior in infants 12 to 24 months. *Merrill-Palmer Quarterly, 11*, 129–148.

Smith, H. (1992). Life history and the evolution of human maturation. *Evolutionary Anthropology, 1*, 134–142.

Spinozzi, G. (1989). Early sensorimotor development in Cebus. In Antinucci, F. (Ed.), *Cognitive Structure and Development of Nonhuman Primates* (pp. 55–66). Hillsdale, NJ: Erlbaum.

Spinozzi, G. (1993). The development of spontaneous classificatory behavior in chimpanzees (*Pan troglodytes*). *Journal of Comparative Psychology, 107*, 193–200.

Spinozzi, G., & Langer, J. (1999). Spontaneous classification in action by a human-enculturated and language-reared bonobo (*Pan paniscus*) and common chimpanzees (*Pan troglodytes*). *Journal of Comparative Psychology, 113*, 286–296.

Spinozzi, G., & Natale, F. (1989). Classification. In F. Antinucci (Ed.), *Cognitive Structure and Development of Nonhuman Primates* (pp. 163–188). Hillsdale, NJ: Erlbaum.

Spinozzi, G., Natale, F., Langer, J., & Brakke, K. (1999). Spontaneous class grouping behavior by bonobos (*Pan paniscus*) and common chimpanzees (*Pan troglodytes*). *Animal Cognition, 2*, 157–170.

Spinozzi, G., Natale, F., Langer, J., & Schlesinger, M. (1998). Developing classification in action. II. Young chimpanzees (*Pan troglodytes*). *Human Evolution, 13*, 125–139.

Starkey, D. (1981). The origins of concept formation: Object sorting and object preference in early infancy. *Child Development, 52*, 489–497.

Sugarman, S. (1983). *Children's Early Thought: Developments in Classification.* New York: Cambridge University Press.

Werner, H. (1948). *Comparative Psychology of Mental Development*. NY: International Universities Press.

Werner, H. & Kaplan, B. (1963). *Symbol Formation*. New York: Wiley

18

WERNER'S DEVELOPMENTAL THOUGHT IN THE STUDY OF ADULT PSYCHOPATHOLOGY

Marion Glick and *Edward Zigler*

Werner's organismic-developmental theory was the theoretical cornerstone for three interrelated programs of research conducted by Ed Zigler with many colleagues over a period of 40 years. The areas of research were developmental approaches to adult psychopathology, to mental retardation, and to the understanding of self-image. This chapter will focus on the developmental approach to adult psychopathology and the contributions of Werner's theory to this endeavor. It will also consider studies that integrate the psychopathology research with the work on self-image and on mental retardation. Such integration was possible because of the common grounding of all three areas of research in Werner's developmental theory.

The developmental approach to adult psychopathology began in collaboration with Leslie Phillips at Worcester State Hospital during Zigler's predoctoral internship year (1958–59). That year spent in the Clark University-Worcester State Hospital complex profoundly altered Zigler's theoretical orientation and set the course for his entire career in psychology. Ed Zigler came to Worcester committed to Hullian behaviorial theory. (In 1957 almost all of psychology was committed to some form of behaviorism with the notable exception of Werner's group at Clark). Two life-changing events occurred in Ed's year at Worcester: (1) learning about Wernerian developmental thought through a seminar taught by Bernard Kaplan, and 2) research conducted with Leslie Phillips on the developmental approach to adult psychopathology. The psychopathology research has continued since that time first in collaboration with Leslie Phillips then with Jack Levine and

for the last 20 years with Marion Glick as primary collaborator. The seminar with Bernie Kaplan became an ongoing debate on the relative merits of behaviorism and developmental thought with Ed defending behaviorism and Bernie attacking it and supporting the developmental side. Kaplan's arguments finally convinced Ed. Thus while he came to Worcester a behaviorist he left a true developmentalist. Developmental principles accordingly became the foundation for all his subsequent work in psychopathology, mental retardation, and social policy for children and families.

Marion Glick received her Ph. D. from Clark and like Ed Zigler interned at Worcester State Hospital. Classes and seminars with Heinz Werner in developmental theory and the ongoing theoretical work of Werner and Kaplan formed the basis for her thinking as a psychologist. The collaboration with Zigler allowed this framework developed at Clark to be expressed in research.

ORGANISMIC-DEVELOPMENTAL THEORY APPLIED TO PSYCHOPATHOLOGY

Basic Principles

The developmental approach to adult psychopathology owes the greatest theoretical debt to Werner's organismic-developmental theory (Werner, 1937, 1948, 1957; Werner & Kaplan, 1963) although the work was also influenced by other developmentalists of both psychoanalytic (e.g., Hartmann, 1952; Rapaport, 1951) and nonpsychoanalytic persuasion (e.g., Lewin, 1946; Piaget, 1951). Inasmuch as they all derive from an organismic perspective, these various positions display considerable commonality in the types of organizational constructs employed. Nevertheless it was Werner and his students who expended the greatest effort in applying developmental principles to phenomena of interest in adult psychopathology. Werner's orthogenetic principle, his delineation of progressive levels of organization, and his assumption that earlier levels of organization are integrated within higher forms of organization are the theoretical underpinnings of the developmental approach to adult psychopathology.

Within Werner's organismic framework, development is defined as both a continuous and a discontinuous process. As Langer (1970) indicated, the dialectic issue is how the organism can change qualitatively with development while at the same time preserving its integrity and inner stability. The continuity of development is expressed in Werner's orthogenetic principle, which states that "wherever development occurs it proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration" (1957 p. 126). This definition of the basic structural nature of developmental change is shared by Lewin, and, although they emphasize it less, by the ego psychologists. Moreover the orthogenetic principle finds a functional equivalent in Piaget's equilibration principle.

Of particular relevance to psychopathology are the implications of this orthogenetic principle for understanding the self in relation to external reality and other people. At earlier developmental levels, subjective experience and external events tend to be undifferentiated. Neither the boundaries nor the point of view of the self can be adequately distinguished from the boundaries and point of view of the other. In psychodynamic terms, this condition is described as the relative lack of boundary articulation and reality testing. Inasmuch as clear distinctions are not made between imagining and perceiving, an individual's own thoughts wishes and fantasies can be confused with external reality. Thus as is the case with hallucinations, internal images may be given the status of tangible external events.

With increasing development, not only are the self and the external world differentiated, they are also reintegrated in complex and relatively stable ways. Furthermore, with development each realm becomes differentiated and hierarchically organized in its own right. In terms of personal and social functioning, a sense of personal identity can be achieved, the individual can perceive the separateness and distinct needs and point of view of the other, and self and other can be reintegrated so that the individual perceives herself or himself as a member and a participant in social interactions. Apprehension of the self and the external world as differentiated entities, each organized in its own right and interrelated with the other, allows for greater planning and active control over both external events and internal need states. Gratification can be delayed, goals can be envisioned, and it becomes possible to employ substitutive means and alternative ends in order to achieve these goals. Adaptive capacities and coping, therefore, increase as a function of the structural changes that define development. Within the developmental approach to adult psychopathology, the use of premorbid social competence as a broad though imperfect benchmark of an individual's developmental level is based upon this assumption that higher developmental forms of functioning provide a basis for greater coping effectiveness. The orthogenetic principle likewise provided the conceptual framework for the developmental interpretation of self-image to be described later in the chapter.

In regard to the discontinuity of developmental change, successive stages are presumed to be marked by the emergence of new properties that render them qualitatively different from and not reducible to developmentally earlier forms. Werner and other developmentalists (e.g., Piaget, Lewin, and many ego psychologists) have suggested that developmentally early behavior is marked by immediate, direct, and unmodulated responses to external stimuli and internal need states. By contrast, indirect, ideational, conceptual, and symbolic or verbal forms of responding characterize developmentally higher functioning (Piaget, 1951; Werner, 1948). In the developmental approach to psychopathology, symptoms are categorized along an action-thought continuum based on this principle. Werner (1948) also posited perceptual organization as a level intermediate between sensory-motor and conceptual modes of organization. Based on this principle, the developmental approach to psychopathology has examined hallucinations as reflecting developmentally lower functioning than delusions.

In developmental transformations, the earlier forms are presumed not to be lost but to be subordinated to and integrated within the higher forms of functioning. The developmentally advanced individual, therefore, possesses a wide range of modes of responding that are both differentiated from each other and hierarchically organized. The earlier forms of functioning are both available to the individual and controlled by the more abstract conceptual processes. This provides an increased flexibility as well as stability at higher levels. Multiple means become available for the achievement of a particular goal, and multiple goals can be served by a single means. The availability of multiple means and alternative ends increases options for adaptive functioning at higher developmental levels (Santostefano & Baker, 1972).

The possibility of multiple means also requires that underlying processes be distinguished from surface appearance in the interpretation of behavior. One cannot assume that two behaviors have the same meaning because they are physically identical. Neither can one assume that two dissimilar behaviors have different meanings. As explicated by Werner (1937) a particular behavior can only be understood through the examination of the processes underlying it and thus of the function that it serves in the total organization of behavior. In psychopathology, specific symptoms have not been found to be consistent over time or to have much predictive value (e.g., Kohlberg, Lacrosse, & Ricks, 1972; Strauss, Carpenter, & Bartko, 1974). By contrast, when surface symptoms have been grouped on the basis of the underlying processes they reflect, e.g., developmental differences in modes of organization, they display longitudinal consistency and predictive efficacy (e.g., Kohlberg et al., 1972; Phillips Broverman, & Zigler, 1966; Prentky Lewine, Watt, & Fryer, 1980; Santostefano & Baker, 1972; Sroufe & Rutter, 1984; Zigler & Phillips, 1961c).

Application in Rorschach Research

A prominent early effort to apply organismic-developmental theory to psychopathology was the programmatic research on Rorschach developmental scoring undertaken within the Clark University-Worcester State Hospital complex in the 1950s. In those years the psychology departments at Clark and at Worcester State Hospital were closely interwoven. At both institutions, Werner's theory was a preeminent influence. Based upon Werner's orthogenetic principle, the structural aspects or form qualities of Rorschach percepts were analyzed for degree of differentiation and hierarchic integration. Central to this work was a conceptualization of psychopathology as representing regression. Thus Rorschach responses of schizophrenic patients were found to be less mature than responses of nonpatients and to resemble the responses of children in some structural characteristics (e.g., Friedman, 1953; Hemmindinger, 1953). Rorschach developmental level was furthermore found to be related to IQ or mental age, social maturity, the ability to take the perspective of another in a role-taking task, action-thought orientation in

symptomatology and paranoid-nonparanoid status in schizophrenia. (e.g., Feffer, 1959; Lane, 1955; Phillips, Kaden, & Waldman, 1959; Siegel, 1953). Higher Rorschach developmental levels characterized patients with a predominance of thought compared to action symptoms and paranoid rather than nonparanoid schizophrenia.

THE DEVELOPMENTAL APPROACH TO ADULT PSYCHOPATHOLOGY

The Initial Work of Zigler and Phillips

Underlying Assumptions

Although influenced by the research on Rorschach developmental level, Zigler and Phillips sought a broader measure of adult developmental level and posited a different view of regression than the one underlying the Rorschach developmental research. In keeping with the formulations of Werner, developmental level was conceptualized as representing the total information-processing system utilized by the individual in mediating all behavior including social emotional and motivational as well as perceptual-cognitive functioning (Zigler, 1963).

In regard to regression, Werner advanced two models whose implications differed. One model, common also to psychoanalytic thinking, assumes that psychopathology represents a regression to developmentally earlier forms of functioning and/or a fixation at these levels. A corollary to this view is that as the severity of psychopathology increases so does the magnitude of regression and consequent level of fixation. In its comparisons of the responses of patients with schizophrenia and those of children, the research on Rorschach developmental level accords with this model of regression.

A fundamental principle in developmental thought is that in the course of development earlier structures are not lost but become reorganized within and subordinated to higher structures. Development thus involves the progressive integration of multiple modes of operation (Werner, 1957). Both Werner (1948, 1957) and his students (e.g., Langer, 1969) have at times conceptualized psychopathology as involving a weakening or breaking down of superordinate integrative structures with a consequent uncontrolled breaking through of lower forms into independent activity. This alternative view of regression underlies the work on the developmental approach to adult psychopathology. This second view accords with findings that more disturbed patients do not uniformly function at lower developmental levels than do less disturbed patients or even nonpsychopathological individuals (see Glick & Zigler, 1986). Moreover an individual patient often functions at a variety of levels and copes even in the midst of pathology.

Basic to the developmental approach to adult psychopathology, therefore, are two assumptions. First, even in adulthood, individuals are presumed to function at different levels along an underlying developmental continuum. This underlying developmental level is assumed to broadly influence social and emotional as

well as cognitive functioning. Secondly, the person's underlying developmental level should continue to influence behavior after the onset of disorder just as it did in the premorbid period. People are not presumed to change characterological modes of responding with the onset of psychopathology by regressing to an earlier level. Instead, patients are assumed to maintain their premorbid developmental characteristics even after the emergence of psychopathology. Manifestations of psychopathology as well as premorbid behavior should reflect the person's same broad underlying developmental characteristics.

Premorbid social competence

When Zigler and Phillips began research on the developmental approach to adult psychopathology, an issue was how to measure developmental level in adults when the concept was broadly conceptualized as including social, emotional, motivational, and cognitive components. They rejected Rorschach developmental scoring for three reasons. First, childlike responses on the Rorschach are emitted too infrequently by adults to make this a very sensitive indicator of developmental variations among adults. Secondly, the perceptual-cognitive realm assessed by the Rorschach seemed too narrow to be employed as a total indicator of developmental level, whose effects permeate the individual's personality and social functioning. Finally, collecting Rorschach developmental scores was considered too laborious a process to easily permit research with large samples.

Given the inherent relationship between developmental level and coping effectiveness, Zigler and Phillips (1960) chose to measure the individual's premorbid social competence. The aim was to establish molar indexes whereby various dimensions important to effective coping in adulthood could be assessed. The selection of indexes to serve as broad albeit imperfect benchmarks of maturity level was guided by a number of considerations. First, the variables examined had to be ones that could reasonably be taken to reflect personal and social maturity. Secondly, they should refer to overt behaviors able to be assessed in a relatively objective, easily quantifiable manner. Thirdly, the behaviors examined should be fairly universal in our society and thus be applicable to most individuals. Finally, in order to allow the examination of sizeable samples, the variables needed to be ones that are routinely recorded in psychiatric case histories. Based on these criteria, six variables thought to be indicative of cognitive and social functioning were selected: age, intelligence, education, marital status, occupation, and employment history (see Zigler & Glick, 1986 for further discussion of the rationale underlying the selection of each variable). Each of these measures was assumed to have a considerable margin of error and none taken in isolation would be a particularly good gauge of developmental level. The hope was that taken together these variables could provide a broadly derived reliable assessment of that most ubiquitous construct in developmental thought, the individual's developmental level.

The variables in the premorbid competence measure overlap with those used to measure premorbid adjustment (e.g., Higgins, 1964) that had been applied previously to patients with schizophrenia in order to designate process (poorer

prognosis) versus reactive (better prognosis) subtypes of schizophrenia. In contrast to this interpretation, Zigler and Phillips construed premorbid social competence as a developmental indicator. Thus they assumed that the measure could be applied to patients in many diagnostic groups and would be related to many major variables in psychopathology in addition to outcome. In all their research, therefore, patients with nonschizophrenic diagnoses (e.g., manic-depressive, neurotic, and character disorder) as well as schizophrenia were examined.

Symptomatology and Diagnosis

Zigler and Phillips utilized two modes of categorizing symptoms developmentally. The first mode of symptom categorization, along an action-thought continuum, was based on the fundamental premise in development theory that expression in direct action reflects developmentally lower functioning than expression in thought or verbal behavior. Consistent with this premise, a predominance of symptoms involving thought or verbal expression (e. g., suicidal ideas, obsessions) rather than action (e.g., suicidal attempt, assaultive) was found to be related to higher social competence in patients with many psychiatric diagnoses (Phillips & Zigler, 1961).

The second categorization of symptoms 1960; used the three symptom clusters that Phillips and Rabinovitch (1958) conceptualized as reflecting three patterns of role orientation: self-deprivation and turning against the self, self-indulgence and turning against others, and avoidance of others. Examples of symptoms in each role orientation are (1) turning against the self: depressed, suicidal attempt; (2) turning against others: assaultive, irresponsible behavior; (3) avoidance of others: delusions, hallucinations, withdrawn. In psychoanalytic theory, development is presumed to entail an increasing incorporation of social demands and values, which if not adhered to give rise to guilt (e.g., Freud, 1961; Rapaport, 1960). Inasmuch as turning against the self implies the internalization of societal values with possible consequent guilt this role orientation was conceptualized as reflecting developmentally higher functioning than the other two role orientations. Because of the developmentally lower characteristics of schizophrenic thought, the role orientation of avoidance of others was initially presumed to reflect developmentally earlier functioning than the other two role orientations. Thus Zigler and Phillips (1960; 1962) hypothesized that the role orientation of turning against the self would be associated with the highest social competence scores, the role orientation of avoidance of others with the lowest, and the role orientation of turning against others with an intermediate level of social competence. Consistent with the developmental interpretations of both premorbid competence and role orientation, higher social competence scores were associated with the role orientation of turning against the self. However, developmental differences did not appear between the role orientations of turning against others and avoidance of others. In these and subsequent investigations, the data supported a two- rather than three-level conceptualization of developmental differences in role orientation, with turning against the self representing a higher level of psychological functioning

than the other two role orientations which did not differ significantly from each other.

Patients diagnosed with manic-depression and psychoneurotic disorders displayed significantly higher premorbid social competence than patients with character disorders or schizophrenia (Zigler & Phillips, 1961a). Although some overlap would be expected between traditional diagnostic categories and role orientation, the magnitude of relationships between these variables was found to be relatively small (Zigler & Phillips, 1961b; 1961c). Patients diagnosed as manic-depressive or psychoneurotic more frequently displayed the role orientation of turning against the self. Patients with diagnoses of character disorder more frequently displayed the role orientation of turning against others, and patients with schizophrenia more frequently manifested symptoms indicative of avoidance of others. Despite some correspondence between role orientation categories and diagnosis, the findings of Zigler and Phillips (1961c) clearly indicated that the two categorization systems based on symptomatology retain a considerable degree of independence.

Outcome

Developmental theory asserts that the increased differentiation and integration that accompany development inherently provide the means for greater adaptability and coping effectiveness. With greater adaptive resources at their disposal, individuals who function at higher developmental levels should be able to cope more effectively with the problems related to their disorders and thus display better outcomes. Although many studies had demonstrated a relationship between premorbid competence or premorbid adjustment and outcome in schizophrenia (see Higgins, 1964), a major issue for Zigler and Phillips (1961d) was whether premorbid competence would relate to outcome with nonschizophrenic psychiatric patients. As indicated previously, the research with schizophrenic patients had been based on the assumption that premorbid adjustment designated subtypes (good vs. poor prognosis) specific to schizophrenic disorder and thus that premorbid adjustment would predict only for patients with schizophrenia. By contrast in assuming that premorbid competence reflected underlying developmental level, Zigler and Phillips hypothesized that premorbid competence and outcome would be related for patients in many diagnostic groups. For patients with manic-depressive, psychoneurotic and character disorders as well as for patients with schizophrenia, higher premorbid social competence was significantly related to shorter initial hospitalizations and fewer rehospitalizations (Zigler & Phillips, 1961d).

Corroboration and Extension of the Initial Work

The initial findings of Zigler and Phillips have been supported in many subsequent studies.

Premorbid Social Competence

The construct validity of the social competence index has been supported by findings that premorbid social competence scores correlate positively with Rorschach developmental level, maturity in moral reasoning, and Loevinger's (e.g., Loevinger & Wessler, 1970) measure of ego development (Glick, 1997; Lerner, 1968; Quinlan, Rogers, & Kegan, 1980). Scoring of the measure has been found to be highly reliable (e.g., Glick, Zigler, & Zigler, 1985; Zigler & Levine, 1981b).

The Zigler-Phillips Social Competence Scale includes education and occupation, conventional measures of socioeconomic status (SES). An issue is whether the predictive efficacy of the social competence measure rests solely on its SES component (e.g., Raskin & Golob, 1966). Based on the results of factor analyses (Zigler & Levine, 1981b), the premorbid competence measure appears to be broader than social class. For most patient groups, factor analyses yielded a three factor solution with age and marital status loading heavily on the first factor, education and occupation on the second and employment history on the third. In addition, less consistent relationships have been found between SES and such variables of interest in psychopathology as symptomatology and outcome than between premorbid competence and these variables (Raskin & Golob, 1966; Klorman, Strauss, & Kokes, 1977).

Symptomatology and Diagnosis

Research has continued to yield significant relationships between premorbid social competence and symptom scores indicative of action-thought orientation and role orientation (Glick et al., 1985; Mylet, Styfco, & Zigler, 1979). A developmental interpretation of hallucinations versus delusions has also been advanced. Werner (1948) particularly emphasized the lower developmental status of perceptual compared to conceptual modes of organization. Based on this principle, hallucinations (false perceptions) without accompanying delusions can be interpreted as reflecting developmentally lower functioning. Delusions (false beliefs) without accompanying hallucinations can be seen as reflecting developmentally higher functioning and the presence of both symptoms would appear to represent an intermediate developmental position between the two single symptom groups. This formulation has been supported in research with patients with schizophrenia and affective psychoses. Within both diagnostic groups, patients who displayed hallucinations but not delusions obtained the lowest premorbid competence scores. Patients with delusions but not hallucinations obtained the highest premorbid competence scores, and patients who displayed both symptoms had competence scores intermediate between those obtained by patients in the two single symptom groups (Glick, Acunzo, & Zigler, 1993; Zigler & Levine, 1983).

Although diagnostic categories and criteria have changed over the years, relationships between social competence and diagnosis remain similar to the ones reported by Zigler and Phillips (1961a). Many studies have found that patients with affective disorder diagnoses obtain higher developmental scores on

measures of premorbid competence and of level of ego development whereas patients with schizophrenia, antisocial personality disorder, and other diagnoses involving impulsive or aggressive behavior obtain lower developmental scores on these measures (see Glick, 1997; Zigler & Glick, 1986). In a sample of treatment-seeking cocaine abusers a similar relationship appeared in regard to comorbid diagnoses. Cocaine abusers with comorbid diagnoses of depression had higher premorbid competence scores than did abusers with a comorbid diagnosis of antisocial personality disorder (Luthar, Glick, Zigler, & Rounsaville, 1993).

Prognosis and Outcome

Relationships between premorbid competence and outcome continue to be found for patients with diagnoses of affective, personality, and neurotic disorders as well as for patients with schizophrenia. Within all these diagnostic groups, patients with higher premorbid competence display shorter initial hospitalizations, fewer rehospitalizations, shorter rehospitalizations, and better early response to neuroleptic treatment (e.g., Glick, Mazure, Bowers, & Zigler, 1993; Glick & Zigler, 1986; 1990; Zigler, Glick, Marsh, 1979).

The developmental formulation has been applied to prognosis and outcome in alcoholism. The essential-reactive distinction in alcoholism designates individuals with poorer (essential) versus better (reactive) prognoses (e.g., Rudie & McGaughran, 1961). This essential-reactive dimension has been found to be highly correlated with social competence, and social competence has been found to be significantly related to outcome in alcoholism (Finney & Moos, 1979; Levine & Zigler, 1973; Sugerman, Reilly, & Albahary, 1965).

In addition to displaying better outcomes after hospitalization, the developmental formulation generates the expectation that individuals at higher developmental levels will be less likely to succumb to psychiatric disorders. If they do, such individuals would be expected to be older at the time the disorders become manifest than patients who function at lower developmental levels. Consistent with this developmental formulation, higher social competence has been found to be related to an older age at first hospitalization for patients with schizophrenia and for those with affective, personality, and neurotic disorders (Glick et al., 1985; Zigler & Levine, 1981a).

Paranoid Schizophrenia

Differences between paranoid and nonparanoid schizophrenia have been investigated within the developmental approach to adult psychopathology and in other research. Based upon these many differences and the similarities that have been observed between paranoia and depression, especially mania, Zigler and Glick (1984, 1988) advanced the hypothesis that paranoid schizophrenia or at least some forms of this disorder may, like mania, represent camouflaged depression.

Differences between Paranoid and Nonparanoid Schizophrenia

A clinical assumption has been that paranoid schizophrenia involves less disorganization and reflects developmentally higher functioning than other types of schizophrenia. In research on Rorschach developmental scoring derived from organismic-developmental theory, Siegel (1953) found that paranoid schizophrenic patients displayed a level of organization that was intermediate between the levels displayed by nonparanoid schizophrenic patients and nonpathological adults. Within the developmental approach to adult psychopathology, findings that patients with paranoid schizophrenia obtain higher premorbid competence scores and are older at first hospitalization than patients with nonparanoid schizophrenia further support the developmentally higher status of paranoid schizophrenia (Zigler & Levine, 1973; Zigler, Levine, & Zigler, 1976; 1977).

Differences between paranoid and nonparanoid schizophrenic patients on a wide variety of cognitive and perceptual tasks further support an interpretation of paranoid schizophrenia as reflecting developmentally higher functioning than nonparanoid schizophrenia. Among the findings are that paranoid compared to nonparanoid schizophrenic patients display less distractibility, greater boundary articulation, greater ability to process complex information, evidence of more extensive perceptual scanning, higher IQ scores, and faster reaction times (see Cromwell & Pithers, 1981 and Zigler & Glick, 1984 for extensive reviews of these and other findings). The symptoms of persecutory delusions and the more frequent evidence of grandiosity also distinguish paranoid schizophrenia from other subtypes.

Paranoid Schizophrenia as Camouflaged Depression

Besides differing in many ways from nonparanoid forms of the disorder, paranoid schizophrenia entails psychodynamic and symptom characteristics similar to those found in depression, especially mania. Depression involves feelings of inadequacy which paradoxically are accompanied also by a sense of personal responsibility for failures and consequent self-castigation and feelings of sadness, guilt, and hopelessness (Abramson & Sackeim, 1977). Kovacs and Beck (1978) describe a self-referential aspect of depression whereby in focusing on the self, a depressed person can interpret even innocent statements by others as disparaging. Many personality theorists (e.g., Rogers, 1961; White, 1959) have maintained that effective functioning and adjustment depend upon a sense of self-worth and personal competence. Yet life experiences do not always confirm a favorable view of self. People's accomplishments fall short of their aims. Personal losses and negative outcomes that lie outside the person's control reinforce self-doubts about personal efficacy. Despite its central importance to adjustment the sense of self-worth is fragile and difficult to maintain, and its loss can give rise to agonizing feelings of depression. It is not surprising, therefore, that depression both as a symptom and a disorder occurs with high frequency (see Zigler & Glick, 1984; 1988) and that many mechanisms that may themselves be maladaptive are employed to ward off the pain of depression. A rather transparent mechanism used by depressed

individuals is mania. In mania, the person denies inadequacies and unhappiness. In effect, the sufferer states "I am not inadequate and unhappy. I am great, and I am very happy." Substance abuse is another mechanism used to escape the pain of depression.

Paranoia may represent another means for warding off depression. A number of theorists have viewed paranoia as representing a defense against loss of the sense of self-worth and the shame and guilt that accompanies such loss (e.g., Dollard & Miller, 1950; Meissner, 1978; Sullivan, 1956). Paranoid mechanisms have been found to be triggered by feelings of inadequacy and associated with low self-esteem (Colby, 1976; Heilbrun & Bronson, 1975). Delusions of persecution, the central symptom of paranoia, assuage the sense of inadequacy in two ways. First, they permit the projection of responsibility for inadequacy and failure onto the outside world. Rather than reflecting one's own shortcomings, failure occurs because of persecution by others. Second, persecutory delusions, including ideas of reference, provide a sense of importance and thus self-enhancement. The paranoid can essentially reassure the self that "far from being inadequate, I must be very important and valuable if everyone is so focused on me."

These characteristics of paranoia most closely resemble forms of depression expressed in mania (manic episodes in bipolar disorder and cyclothymic disorder). In both paranoia and mania, the disordered individual turns the depression upside-down and asserts his or her worth and well being. In a comprehensive review, Pope and Lipinsky (1978) emphasized the similarity of symptoms in mania and paranoid schizophrenia. Glick et al., (1993) found that 76% of bipolar affective disorder patients displayed delusions and Clayton, Pitts, and Winokur (1965) reported similar findings. Delusions of persecution have been reported for one half to almost two thirds of patients in manic samples (Carlson & Goodwin, 1973; Taylor & Abrams, 1975). These similarities in both psychodynamic characteristics and symptomatology between paranoid and manic patients led to the formulation that paranoia or at least some forms of the disorder may like mania represent a camouflaged depression.

Summary

The application of developmental principles, primarily Werner's organismic-developmental theory, to adult psychopathology has led to a broad body of interrelated findings. For patients in many diagnostic groups, developmental level has been found to be related to many major variables of clinical significance (see Table 1). This work demonstrates the value of developmental theory in providing an integrative framework within which the various forms of psychopathology can be understood in relation to each other. Despite differences in particular forms of behavioral expression, underlying similarities can be discerned. Developmental thinking furthermore permits a classification system based on a coherent, theoretically derived, interrelated set of principles. Moreover, viewing psychopathology

TABLE 1. Developmental differences in adult psychopathology

	Developmental level	
Variable	Lower	Higher
Premorbid social competence	Lower	Higher
Symptomatology		
(1) Action-thought orientation	Action	Thought
(2) Role orientation	Turning against others Avoidance of others	Turning against self
(3) Hallucinations-delusions	Hallucinations	Delusions
Diagnosis	Schizophrenia, anti-social personality disorder	Affective disorder, neurosis
Schizophrenia subtype	Nonparanoid	Paranoid
Outcome		
(1) Initial hospitalization	Longer	Shorter
(2) Rehospitalization	More and longer	Fewer and shorter
(3) Early neuroleptic response	Poorer	Better
(4) Posthospital social and work functioning	Poorer	Better
Age at first hospitalization	Younger	Older
Self-image disparity	Less	More

within the context of normal maturation allows for an emphasis on the adaptive potential of the individual and provides a framework whereby the movement between pathological and nonpathological states can be understood.

THE COGNITIVE-DEVELOPMENTAL INTERPRETATION OF SELF-IMAGE

Werner's orthogenetic principle was central to the cognitive-developmental formulation of self-image. Because self-image is relevant to both normal and disordered development and to the functioning of both children and adults, the research on self-image has examined normative child development, children with mild mental retardation and those with emotional disorders, and adult psychiatric patients. Although the research has considered diverse populations, the findings have advanced a single developmental formulation.

This research particularly illustrates the integrative value of developmental psychopathology, a field that has received increasing attention in recent years. As in all the research reviewed in this chapter, principles from classical developmental theory are applied to the investigation of psychopathology and other clinical phenomena. Through this integration of developmental and clinical psychology, knowledge about normal development informs issues in psychopathology, and discoveries in the fields of psychopathology and atypical development enhance understanding of normative developmental processes.

The Formulation

Achenbach and Zigler (1963) first advanced the cognitive-developmental interpretation of self-image disparity. They posited that increased disparity between the real self-image (one's current view of self) and the ideal self-image (the ideal person that one would like to be) was not an indicator of maladjustment but a natural concomitant of normal growth and development. This formulation was based on Werner's orthogenetic principle that higher levels of development entail greater cognitive differentiation. Inasmuch as self-images are symbolic conceptual constructions, greater differentiation or disparity between aspects of the self-image (the real and ideal self-images) should appear at higher developmental levels. In addition, individuals at higher developmental levels are presumed to incorporate increasingly complex social demands and expectations (Zigler & Phillips, 1960). The greater self-demands at higher developmental levels and the guilt that may accompany them should also result in greater disparity between the real and ideal self-images.

This developmental formulation contrasts markedly with the more traditional view of self-image disparity (e.g., Rogers & Dymond, 1954; Higgins, Klein, & Strauman, 1985). Whereas the traditional view interprets greater real-ideal self-image disparity as an indicator of a lack of positive self-regard and thus of maladjustment, the developmental formulation interprets this disparity as reflecting higher developmental functioning.

Cognitive-developmental Differences in Self-image

Consistent with the developmental formulation, adult psychiatric and medical patients with higher developmental functioning as indicated by social competence have been found to display greater real-ideal self-image disparity and also greater differentiation in other aspects of the self-image than lower competence patients (Achenbach & Zigler, 1963; Mylet, Styfco, & Zigler, 1979). Contrary to the traditional view that self-image disparity indicates maladjustment, psychiatric and medical patients were not found to differ in real-ideal self-image disparity.

The cognitive-developmental interpretation of real-ideal self-image disparity has received consistent support in many studies of children and adolescents, both those exhibiting typical development and those with emotional disturbance or mild mental retardation (Glick, 1999; Katz & Zigler, 1967; Katz, Zigler, & Zalk, 1975; Leahy, 1981; Leahy, Balla, & Zigler, 1982; Luthar, Zigler, & Goldstein, 1992; D. Phillips & Zigler, 1980; Zigler, Balla, & Watson, 1972). In this research, greater real-ideal self-image disparity has been found to relate to higher developmental functioning as indicated by each of the following variables:

1. Older chronological age in children with typical development, in children with emotional disturbance, and in children with mild mental retardation.
2. Superior rather than average cognitive ability.

3. Average cognitive ability rather than mild mental retardation.
4. The presence of thought (internalizing) rather than action (externalizing) symptoms in children with emotional disturbance. As in the research with adults, thought symptoms are presumed to reflect higher developmental functioning (Piaget, 1951; Werner, 1948).
5. Evidence of nonegocentric thought in a role-taking task and greater maturity in moral reasoning.

All these studies also revealed that a higher ideal self-image was associated with higher developmental functioning as indicated by all of the variables just listed. In middle-class children and adolescents, Bybee (1986) furthermore found that a higher ideal (but not a higher real) self-image was related to better adjustment. Research has also examined children's spontaneous descriptions of their real and ideal self-images (Bybee, Glick, & Zigler, 1990).

Experiential Influences

A variety of experiential variables that affect how others respond to the individual in everyday social-psychological interactions have been found to have important moderating influences on self-image development. The influence of experiential variables has primarily been examined in research with atypical populations. Lower (less positive) real self-images have been found in: (1) children (with or without mental retardation) who live in institutions rather than home settings, (2) emotionally disturbed children especially those with symptom expression in action rather than thought, (3) children with mental retardation compared with children of average intelligence of the same mental age (MA), and (4) adult psychiatric compared to medical patients (Katz et al., 1975; Leahy et al., 1982; Mylet et al., 1979; Zigler et al., 1972).

In addition to lower real self-images, children in institutions and those with externalizing behavior problems displayed lower ideal self-images and less self-image disparity than children in home settings or without externalizing behavior problems. These children appear both to think poorly of themselves and to show little aspiration for change.

Summary

Individuals who function at higher developmental levels consistently have been found to display greater real-ideal self-image disparity. In children and young adolescents, the greater disparity at higher developmental levels primarily reflects an increasingly higher (more positive) ideal self-image. Higher self-images have also been found to relate to good adjustment. Rather than impeding development, therefore, a higher ideal self-image may reflect higher aspirations and a positive view of life's possibilities that can motivate and guide development. Negative life

experiences such as those involving stigmatization and failure have primarily been found to influence the real-self image, leading to a more negative view of self.

A Possible Reconciliation of the Traditional and Cognitive-developmental Interpretations of Self-image

Findings have consistently supported the cognitive-developmental interpretation of self-image disparity. Nevertheless, one can ask whether increased disparity between the real and ideal self-images is invariably adaptive. Extremely high and unrealistic aspirations could paralyze rather than facilitate adaptive functioning. Such aspirations could also represent denial and the substitution of fantasy solutions for realistic striving. Both these situations are characterized by the absence of a perceived relationship between the ideal and the real self-images. Moreover, findings that clients in outpatient therapy displayed greater real-ideal disparity than control subjects and that disparity decreased over the course of successful therapy (e.g., Rogers and Dymond, 1954) support the traditional interpretation that increased self-image disparity reflects maladjustment.

Developmental theory provides a possible basis for reconciling the cognitive-developmental and traditional interpretations of self-image disparity (Glick & Zigler, 1985). By applying Werner's orthogenetic principle, three levels can be distinguished in relations between the real and the ideal self-images. At the earliest level, characterized by global organization, the ideal self-image, being inseparable from the real self-image, could provide no motivation or direction for change. An intermediate level of organization can be conceptualized as involving differentiation with insufficient reintegration of real and ideal self-images. Aware of the discrepancy between the ideal and the actual, an individual at this stage of development might be motivated for change but lack a sense of appropriate direction and means for its accomplishment. At this stage, discrepancy might give rise to feelings of self-dissatisfaction and helplessness. At the highest level of organization, the ideal self-image would be expected to be conceptualized in relation to an articulated real self-image. Rather than desiring to be utterly different, individuals at this stage might be more likely to envision change as the development and modification of qualities they already perceive in themselves. Such reintegration of the real and ideal self-images would not only provide motivation for change but would allow conceptualization of appropriate directions and subgoals, thereby facilitating adaptation.

Within this conceptualization involving three levels, clients in outpatient therapy who have been found to display greater real-ideal disparity than nonclients and decreased disparity over the course of successful therapy (e.g., Rogers & Dymond, 1954) can be posited to be at the intermediate level. Consistent with this assumption, entrance into outpatient therapy is frequently self-motivated and accompanied by expressions of self-disparagement, depression, and anxiety. For individuals at this level, improvement might well entail the reintegration of real and ideal self-images with a resulting decrease in disparity. By contrast, a developmentally earlier global level of organization might be more characteristic of certain psychiatric inpatients

and children with action-oriented symptoms. For these groups, diminished real-ideal self-image disparity would not be construed as a favorable sign, and treatment might be directed toward increasing disparity by raising the ideal self-image.

ADULT PSYCHOPATHOLOGY IN MENTAL RETARDATION

Werner's organismic-developmental theory fundamentally influenced the broad body of work on the developmental approach to mental retardation. Like the work on psychopathology, this research, conducted in collaboration with many colleagues, has been ongoing for over 40 years. In the developmental approach to mental retardation, the principles of development that characterize nonretarded people are assumed to apply as well to individuals with nonorganic mental retardation. The majority of these individuals have mental retardation in the mild range. Individuals with nonorganic mental retardation are assumed to differ from the general population only in that development proceeds more slowly and attains a lower upper limit (e.g., Zigler, 1969; Zigler & Hodapp, 1986). The research on the developmental approach to mental retardation has examined many variables, e.g., personality and motivation, influences of institutionalization and experiences of failure. Given its focus, this chapter will consider only two studies that extend the developmental approach to adult psychopathology to psychiatric patients with mental retardation. Although the work on psychopathology and mental retardation derived from the same underlying developmental formulation, the two lines of research had not previously been integrated.

Inasmuch as the developmental approaches to psychopathology and to mental retardation are based on the same developmental principles, many of the constructs from the psychopathology research should be applicable to psychiatric patients with mental retardation. Glick and Zigler (1995) examined developmental differences in the symptomatology of psychiatric inpatients with and without mild mental retardation. Consistent with developmental expectations, patients with mild mental retardation displayed symptom pictures indicative of developmentally lower functioning than ones displayed by patients without mental retardation. Specifically the patients with mental retardation were found to have: (1) more symptoms involving expression in action rather than in thought or verbal behavior, (2) more symptoms indicative of the role orientation of turning against others and fewer symptoms indicative of turning against the self, and (3) more hallucinations without accompanying delusions than patients without mental retardation.

Glick and Zigler (1996) found further that a measure of premorbid social competence adapted to be appropriate to individuals with mild mental retardation could differentiate developmental level within a sample of psychiatric patients with mild mental retardation. As has been found for nonretarded patients, for patients with mild mental retardation, lower premorbid competence was associated with a predominance of action-oriented rather than thought-oriented symptoms. Furthermore both developmental variables, premorbid competence and thought-action

orientation in symptomatology, were found to make independent contributions to overall variance in outcome as gauged by length of current hospitalization.

This research points to the value of integrating the developmental approaches to psychopathology and mental retardation. The integration provides a theoretical framework within which symptoms and other aspects of psychopathology in people with mild mental retardation can be organized and understood in relation to the broad body of knowledge about psychopathology in people without mental retardation. Constructs from the developmental approach to adult psychopathology were found to apply to psychiatric patients with mild mental retardation, and the results indicated that there is sufficient heterogeneity in the developmental level of patients with mild mental retardation to further differentiate this group using developmental principles.

CONCLUSION

The developmental approaches to psychopathology and self-image reviewed in this article as well as Zigler's broad body of research on mental retardation owe a primary theoretical debt to organismic developmental theory (e.g., Werner, 1948; 1957; Werner & Kaplan, 1963). The research and the formulations of the developmental approach to adult psychopathology that unfolded over the course of more than 40 years demonstrate the power of organismic-developmental theory for understanding and interrelating many major variables in psychopathology. The application of developmental theory has enabled the generation and testing of hypotheses about premorbid social competence, symptomatology, diagnosis, paranoid-nonparanoid status in schizophrenia, prognosis, outcome, and self-images as personality variables. This has created a broad body of data through which these diverse phenomena can be integrated and understood in relation to each other. With respect to psychopathology as well as other aspects of behavior, the developmental framework has allowed the functioning of people with mental retardation to be understood and integrated with the broad body of knowledge about the functioning of people without mental retardation.

REFERENCES

Achenbach, T., & Zigler, E. (1963). Social competence and self-image disparity in psychiatric and nonpsychiatric patients. *Journal of Abnormal and Social Psychology, 67,* 197–205.

Abramson, L., & Sackeim, H. (1977). A paradox in depression: Uncontrollability and self-blame. *Psychological Bulletin, 84,* 838–851.

Bybee, J. (1986). *The self-image and guilt: Relationships to gender, developmental level, and classroom adjustment.* Unpublished doctoral dissertation, Yale University.

Bybee, J., Glick, M., & Zigler, E. (1990). Differences across gender, grade level, and academic track in the content of the ideal self-image. *Sex Roles, 22,* 349–358.

Carlson, G. A., & Goodwin, F. K. (1973). The stages of mania: A longitudinal analysis of the manic episode. *Archives of General Psychiatry, 28,* 221–228.

Clayton, P., Pitts, F. N., & Winokur, G. (1965). Affective disorder. IV mania. *Comprehensive Psychiatry, 5,* 313–323.

Colby, K. (1976). Clinical implications of a simulation model of paranoid processes. *Archives of General Psychiatry, 33,* 854–857.

Cromwell, R., & Pithers, W. (1981). Schizophrenic/paranoid psychoses: Determining diagnostic divisions. *Schizophrenia Bulletin, 7,* 674–688.

Dollard, J., & Miller, N. (1950). *Personality and psychotherapy.* New York: McGraw-Hill.

Feffer, M. H. (1959). The cognitive implications of role taking behavior. *Journal of Personality, 27,* 152–168.

Finney, J., & Moos, R. (1979). Treatment and outcome for empirical subtypes of alcoholic patients. *Journal of Consulting and Clinical Psychology, 47,* 25–38.

Freud, S. (1961). The ego and the id. In J. Strachey (Ed. And Trans.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 19, pp. 3–66). London: Hogarth Press. (Original work published 1923)

Friedman, H. (1953). Perceptual regression in schizophrenia: An hypothesis suggested by use of the Rorschach test. *Journal of Projective Techniques, 17,* 171–185.

Glick, M. (1997). The developmental approach to adult psychopathology. In S .S. Luthar, J. A. Burack, D. Cicchetti, & J. R. Weisz (Eds.), *Developmental psychopathology: Perspectives on adjustment, risk, and disorder* (pp. 227–247). New York: Cambridge University Press.

Glick, M. (1999). Developmental and experiential variables in the self-images of people with mild mental retardation. In E. Zigler & D. Bennett-Gates (Eds.), *Personality development in individuals with mental retardation* (pp. 47–69). New York: Cambridge University Press.

Glick, M. Acunzo, M., & Zigler, E. (1993). Extending the developmental interpretation of delusions and hallucinations to bipolar affective disorder patients. Unpublished manuscript.

Glick, M., Mazure, C., Bowers, M., & Zigler, E. (1993). Premorbid social competence and the effectiveness of neuroleptic treatment. *Comprehensive Psychiatry, 34,* 396–401.

Glick, M., & Zigler, E. (1985). Self-image: A cognitive-developmental approach. In R. Leahy (Ed.), *The development of self* (pp.1–42). New York: Academic Press.

Glick, M., & Zigler, E. (1986). Premorbid competence and psychiatric outcome in male and female nonschizophrenic patients. *Journal of Consulting and Clinical Psychology, 54,* 402–403.

Glick, M., & Zigler, E. (1990). Premorbid competence and the courses and outcomes of psychiatric disorders. In J. Rolf, A. Masten, D. Cicchetti, K. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in psychopathology* (pp. 497–513). New York: Cambridge University Press.

Glick, M. & Zigler, E. (1995). Developmental differences in the symptomatology of psychiatric inpatients with and without mild mental retardation. *American Journal on Mental Retardation, 99,* 407–417.

Glick, M. & Zigler, E. (1996). Premorbid competence, thought-action orientation, and outcome in psychiatric patients with mild mental retardation. *Development and Psychopathology, 8,* 585–595.

Glick, M., Zigler, E., & Zigler, B. (1985). Developmental correlates of age on first hospitalization in nonschizophrenic psychiatric patients. *Journal of Nervous and Mental Disease, 173,* 677–684.

Hartman, H. (1952). Mutual influences in the development of ego and id. *Psychoanalytic Study of the Child, 7,* 9–30.

Heilbrun, A. B., & Bronson, N. (1975). The fabrication of delusional thinking in normals. *Journal of Abnormal Psychology, 84,* 422–425.

Hemmindinger, L. (1953). Perceptual organizational development as reflected in the structure of Rorschach responses. *Journal of Projective Techniques, 17,* 162–170.

Higgins, E. T., Klein, R., & Strauman, T. (1985). Self-concept discrepancy theory: A psychological model for distinguishing among different aspects of depression and anxiety. *Social Cognition, 3,* 51–76.

Higgins, J. (1964). The concept of process-reactive schizophrenia: Criteria and related research. *Journal of Nervous and Mental Disease, 138,* 9–25.

Katz, P., & Zigler, E. (1967). Self-image disparity: A developmental approach. *Journal of Personality and Social Psychology, 5,* 186–195.

Katz, P., Zigler, E., & Zalk, S. (1975). Children's self-image disparity: The effects of age, maladjustment and action-thought orientation. *Developmental Psychology, 11,* 546–550.

Klorman, R., Strauss, J. S., & Kokes, R. F. (1977). Premorbid adjustment in schizophrenia. III. The relationship of demographic and diagnostic factors to measures of premorbid adjustment in schizophrenia. *Schizophrenia Bulletin, 3,* 214–225.

Kohlberg, L., LaCrosse, J., & Ricks, D. (1972). The predictability of adult mental health from childhood behavior. In B. Wolman (Ed.), *Manual of child psychopathology* (pp. 1217–1284). New York: Rand McNally.

Kovacs, M., & Beck, A. T. (1978). Maladaptive cognitive structures in depression. *American Journal of Psychiatry, 135,* 525–533.

Lane, J. (1955). Social effectiveness and developmental level. *Journal of Personality, 23,* 274–284.

Langer, J. (1969). *Theories of development. New York: Holt, Rinehart, & Winston.*

Langer, J. (1970). Werner's comparative organismic theory. In P. H. Mussen (Ed.), *Carmichael's Manual of Child Psychology* (3rd ed.) (pp. 733–771). New York: Wiley.

Leahy, R. (1981). Parental practices and the development of moral judgment and self-image disparity during adolescence. *Developmental Psychology, 17,* 580–594.

Leahy, R., Balla, D., & Zigler, E. (1982). Role-taking, self-image, and imitation in retarded and nonretarded individuals. *American Journal of Mental Deficiency, 86,* 372–379.

Lerner, P. M. (1968). Correlation of social competence and level of cognitive perceptual functioning in male schizophrenics. *Journal of Nervous and Mental Disease, 146,* 412–416.

Levine, J., & Zigler, E. (1973). The essential-reactive distinction in alcoholism: A developmental approach. *Journal of Abnormal Psychology, 81,* 242–249.

Lewin, K. (1946). Behavior and development as a function of the total situation. In L. Carmichael (Ed.), *Manual of child psychology,* (pp. 791–844). New York: Wiley.

Loevinger, J. & Wessler, R. (1970). *Measuring ego development (Vol. 1).* San Francisco: Jossey-Bass.

Luthar, S. S., Glick, M., Zigler, E., & Rounsaville, B. (1993). Social competence among cocaine abusers: Moderating effects of comorbid diagnosis and gender. *American Journal of Drug and Alcohol Abuse, 19,* 283–298.

Luthar, S. S., Zigler, E., & Goldstein, D. (1992). Psychosocial adjustment among intellectually gifted adolescents: The role of cognitive-developmental and experiential factors. *Journal of Child Psychology and Psychiatry, 33,* 361–373.

Meissner, W. W. (1981). The schizophrenic and the paranoid process. *Schizophrenia Bulletin, 7,* 611–631.

Mylet, M., Styfco, S. J., & Zigler, E. (1979). The interrelationship between self-image disparity and social competence, defensive style, and adjustment status. *Journal of Nervous and Mental Disease, 167,* 553–560.

Phillips, D. A., & Zigler, E. (1980). Children's self-image disparity: Effects of age, socioeconomic status, ethnicity, and gender. *Journal of Personality and Social Psychology, 39,* 689–700.

Phillips, L., Broverman, I. K. , & Zigler, E. (1966). Social competence and psychiatric diagnosis. *Journal of Abnormal Psychology, 71,* 209–214.

Phillips, L., Kaden, S., & Waldman, M. (1959). Rorschach indices of developmental level. *Journal of Genetic Psychology, 94,* 267–285.

Phillips, L. & Rabinovitch, M. (1958). Social role and patterns of symptomatic behavior. *Journal of Abnormal and Social Psychology, 57,* 181–186.

Phillips, L. & Zigler, E. (1961). Social competence: The action-thought parameter and vicariousness in normal and pathological behavior. *Journal of Abnormal and Social Psychology, 63,* 137–146.

Piaget, J. (1951). Principle factors in determining evolution from childhood to adult life. In D. Rapaport (Ed.), *Organization and pathology of thought* (pp. 154–175). New York: Columbia University Press.

Pope, H. G. Jr., & Lipinsky, J. F. (1978). Diagnosis in depression and manic-depressive illness. *Archives of General Psychiatry, 35,* 811–828.

Prentky, R. A., Lewine, R. R. J., Watt, N., & Fryer, J. H. (1980). A longitudinal study of psychiatric outcome: Developmental variables vs. psychiatric symptoms. *Schizophrenia Bulletin, 6,* 139–148.

Quinlan, D. M., Rogers, L. R., & Kegan, R. G. (1980, April). *Developmental dimensions of psychopathology.* Paper presented at the convention of the Eastern Psychological Association, Hartford, CT.

Rapaport, D. (1951). Toward a theory of thinking. In D. Rapaport (Ed.), *Organization and pathology of thought* (pp. 689–730). New York: Columbia University Press.

Rapaport, D. (1960). The structure of psychoanalytic theory: A systematic attempt. *Psychological Issues* [Monograph 6]. New York: International Universities Press.

Raskin, A., & Golob, R. (1966). Occurrence of sex and social class differences in premorbid competence, symptom and outcome measures in acute schizophrenics. *Psychological Reports, 18,* 11–22.

Rogers, C. R. (1961). *On becoming a person.* Boston: Houghton Mifflin.

Rogers, C. R., & Dymond, R. F. (Eds.). (1954). *Psychotherapy and personality change.* Chicago: University of Chicago Press.

Rudie, R., & McGaughran, L. (1961). Differences in developmental experiences, defensiveness, and personality organization between two classes of problem drinkers. *Journal of Abnormal and Social Psychology, 62,* 659–665.

Santostefano, S. & Baker, H. (1972). The contribution of developmental psychology. In B. Wolman (Ed.), *Manual of child psychopathology* (pp. 1113–1153). New York: McGraw-Hill.

Siegel, E. L. (1953). Genetic parallels of perceptual structuralization in paranoid schizophrenia: An analysis by means of the Rorschach technique. *Journal of Projective Techniques, 17,* 151–161.

Sroufe, L. A., & Rutter, M. (1984). The domain of developmental psychopathology. *Child Development, 55,* 17–29.

Strauss, J. S., Carpenter, W. T., Jr., & Bartko, J. J. (1974). The diagnosis and understanding of schizophrenia. III. Speculations on the processes that underlie schizophrenic symptoms and signs. *Schizophrenia Bulletin, 11,* 61–69.

Sugerman, A., Reilly, D., & Albahary, R. (1965). Social competence and the essential-reactive distinction in alcoholism. *Archives of General Psychiatry, 12,* 552–556.

Taylor, M. A., & Abrams, R. (1975). Acute mania: Clinical and genetic study of responders and nonresponders to treatment. *Archives of General Psychiatry, 32,* 863–865.

Werner, H. (1937). Process and achievement: A basic problem of education and developmental psychology. *Harvard Educational Review, 7,* 353–368.

Werner, H. (1948). *Comparative psychology of mental development.* New York: Follett.

Werner, H. (1957). The concept of development from a comparative and organismic point of view. In D. Harris (Ed.), *The concept of development: An issue in the study of human behavior* (pp. 125–148). Minneapolis: University of Minnesota Press.

Werner, H., & Kaplan, B. (1963). *Symbol formation: An organismic-developmental approach to language and the expression of thought.* New York: Wiley.

White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review, 66,* 297–333.

Zigler, E. (1963). Metatheoretical issues in developmental psychology. In M. Marz (Ed.), *Theories in contemporary psychology* (pp. 341–369). New York: MacMillan.

Zigler, E. (1969). Developmental versus difference theories of mental retardation and the problem of motivation. *American Journal of Mental Deficiency, 73,* 536–556.

Zigler, E., Balla, D., & Watson, N. (1972). Experiential determinants of self-image disparity in institutionalized and noninstitutionalized retarded and normal children. *Journal of Personality and Social Psychology, 23,* 81–87.

Zigler, E., & Glick, M. (1984). Paranoid schizophrenia: An unorthodox view. *American Journal of Orthopsychiatry, 54,* 43–71.

Zigler, E., & Glick, M. (1986). *A developmental approach to adult psychopathology.* New York: Wiley.

Zigler, E., & Glick, M. (1988). Is paranoid schizophrenia really camouflaged depression? *American Psychologist, 43,* 284–290.

Zigler, E., Glick, M., & Marsh, A. (1979). Premorbid social competence and outcome among schizophrenic and nonschizophrenic patients. *Journal of Nervous and Mental Disease, 167,* 478–483.

Zigler, E., & Hodapp, R. (1986). *Understanding mental retardation.* New York: Cambridge University Press.

Zigler, E., & Levine, J. (1973). Premorbid adjustment and paranoid-nonparanoid status in schizophrenia: A further investigation. *Journal of Abnormal Psychology, 82,* 189–199.

Zigler, E., & Levine, J. (1981a). Age of first hospitalization of male and female paranoid and nonparanoid schizophrenics: A developmental approach. *Journal of Abnormal Psychology, 90,* 458–467.

Zigler, E., & Levine, J. (1981b). Premorbid competence in schizophrenia: What is being measured? *Journal of Consulting and Clinical Psychology, 49,* 96–105.

Zigler, E., & Levine, J. (1983). Hallucinations vs. delusions: A developmental approach. *Journal of Nervous and Mental Disease, 171,* 141–146.

Zigler, E., Levine, J., & Zigler, B. (1976). The relation between premorbid competence and paranoid-nonparanoid status in schizophrenia: A methodological and theoretical critique. *Psychological Bulletin, 83,* 303–313.

Zigler, E., Levine, J., & Zigler, B. (1977). Premorbid social competence and paranoid-nonparanoid status in female schizophrenic patients. *Journal of Nervous and Mental Disease, 164,* 333–339.

Zigler, E., & Phillips, L. (1960). Social effectiveness and symptomatic behaviors. *Journal of Abnormal and Social Psychology, 61,* 231–238.

Zigler, E., & Phillips, L. (1961a). Case history data and psychiatric diagnosis. *Journal of Consulting Psychology, 25,* 258.

Zigler, E., & Phillips, L. (1961b). Psychiatric diagnosis: A critique. *Journal of Abnormal and Social Psychology, 63,* 607–618.

Zigler, E., & Phillips, L. (1961c). Psychiatric diagnosis and symptomatology. *Journal of Abnormal and Social Psychology, 63,* 69–75.

Zigler, E., & Phillips, L. (1961d). Social competence and outcome in psychiatric disorder. *Journal of Abnormal and Social Psychology, 63,* 264–271.

Zigler, E., & Phillips, L. (1962). Social competence and the process-reactive distinction in psychopathology. *Journal of Abnormal and Social Psychology, 65,* 215–222.

19

HEINZ WERNER: CATALYST FOR A NEW WAY OF UNDERSTANDING AND TREATING CHILDREN ON THE AUTISM SPECTRUM

Arnold Miller

The term, catalyst, has as one of its core meanings "One that precipitates a process or event..." This precisely captures the role that Heinz Werner played in the work that has occupied me, my wife and our staff at the Center for the last 40 years.

WERNER'S DEVELOPMENTAL THEORY

Werner's theory of development presents a series of broad principles for which he recruited support from different domains including child development, psychopathology as well as from anthropology. Werner posits three broad levels of development: sensori-motor, perceptual and conceptual through which the organism develops. In the mature organism these levels are hierarchically integrated with more advanced subordinating earlier levels. Under certain conditions, the higher levels may tap into the resources of lower levels. These conditions include cortical insult, experimentally induced "lapse of meaning" (Miller, 1959, 1963), creative functioning, schizophrenia. Werner (1948, p. 53) as well as Werner and Kaplan (1963) posit an orthogenetic principle in which the direction of development progresses from syncretic (fused) to discrete, from indefinite to definite, from rigid to flexible, from labile to stable and, of course, from reactive to more directed and hierarchically organized functioning (see Kaplan, Bhatia & Josephs, this volume).

According to Werner, mature functioning entails "... flexibility of response in order to preserve the functional equilibrium of the organism in the face of mutable situations." (Werner, 1948, p. 55.). To access that functional equilibrium, the organism must first achieve a polarity between the body/self and the external world. Werner's use of concrete examples from diaries of small children kept by their parents as well as from experiments from the literature and those he conducted with others, provides an immediacy to the levels he describes. Of outstanding value in Werner and Werner and Kaplan's work is the extent to which it allowed us to make developmental sense of the unusual behaviors found among children with autism. Our efforts over many years to help these children, revealed both the seminal importance of Werner's formulations as well as their limitations.

Sensorimotor Level

Werner's discussion of children's "thing-of-action" and their reactivity to the physiognomic properties of objects have been important in our work as has been his explication of how space develops for the child. Equally important has been his description of syncretism and how the organism—at first dominated by surroundings—gradually differentiates body/self from world. Among the contributions of this stage are his description of single-track functioning and the nature of ritual among young children.

Perceptual Level

Physiognomic perception—indicating how children begin to make visual-motor-affective contact with their surroundings—contributed to the notion of systems (described later) as well as to a reading program (Symbol Accentuation) designed to help special children achieve reading and writing. Werner's discussion of synaesthesia in young children has contributed to the formulating of the inclusion principle.

Conceptual Level

The manner in which symbolic functioning develops—particularly in terms of the early development of naming and its syncretic relation to objects—as described both by Werner (1948) and Werner and Kaplan (1963)—provided a framework for our thinking. Even concepts—such as ***pars pro toto***—which were unsatisfactory for our purposes were important because they led to thinking about the process which made this phenomenon possible. Werner's contrast of the "geometrical-technical" with earlier thing-of-action and physiognomic stances has been relevant as has been his trenchant discussions of the emergence of the ability to abstract and generalize.

Concept of Sphere of Reality

Central to our thinking has been the ***Umwelt*** concept which Werner derived from his friend and colleague, Jakob von Uexküll (1926), and, with his student Marta Muchow, elaborated to indicate how children's experience of reality differed from those of adults. This concept has been invaluable in developing the **Miller *Umwelt* Assessment** to sort out the unique way children on the autism spectrum experience the world.

Child Magic

Werner's description of the way that children bring together unrelated events by "contiguity magic" (Werner, 1948, p. 357) has suggested ways in which children on the autism spectrum may benefit from strategies which begin with "magic" but then transition to reality. It has also contributed to the formulation of the extension principle and its application in the Symbol Accentuation Reading Program (Miller & Miller, 1968; 1971).

THE NATURE AND IMPACT OF AUTISTIC CHILDREN

There is an existential clash when one confronts a profoundly disordered child on the autism spectrum for the first time. The child is often very appealing, even beautiful, but behaves as if one does not exist. The felt need is to elicit some kind of response—a fleeting glance, a smile—anything that communicates that one is more than wall paper for that child. But the child does not permit this. As one parent put it, "You knock . . . but no one answers."

The common second reaction to these children is to "rationalize" away the children's disorder as many parents do by viewing the child's profound resistance to change or to following directions as simply "being stubborn" and their resistance to including others in their play as being due to their "loner" nature. Sometimes parents deal with their child's inability to communicate with the comment "After all, Einstein didn't speak until he was four."

At the more severe end of the continuum, one finds children who echo commercials from radio and television, who flap their arms and twiddle fingers in front of their faces, who run in circles or from wall to wall in a room and who get lost finding their way to the bathroom. Often, too, they demonstrate poor reactivity to pain, clumsiness and an uncertain sense of their own bodies.

Different Approaches to the Problem of Autism

After Leo Kanner (1943, 1971) described the syndrome, there have been differences about how to understand and treat it. The first approach in the 1950s was from a psychoanalytic perspective and assumed that "refrigerator" parents were

responsible. Bruno Bettelheim (1950) was a notable proponent of this approach. In the early 1960s this was supplanted by a behavioral approach derived from learning theory and based on Skinner's findings in animal experimentation. Ivar Lovaas (1987) was and is one of the foremost proponents of the Applied Behavior Analysis approach. At about the same time, we introduced our cognitive-developmental systems approach with its roots in Werner's developmental theory (Miller and Miller, 1968; 1971; 1973).

Psychoanalytic approaches assumed that maternal deprivation was the major source of the disorder—probably because some of the manifestations of autism superficially mirrored findings with emotionally deprived and withdrawn infants reported by Rene Spitz (1945–1946). These children rapidly improved when provided with regular nurturing. Seeing some of the same kinds of behavior among autistic children, psychoanalytic therapists sought to treat the disorder by addressing the assumed deprivation. (I well remember Dr. Joseph Weinreb, a prominent psychoanalyst who directed the Worcester Youth Guidance Center for over a decade, feeding candy to children with autism from his "breast" pockets to treat the assumed oral deprivation of the children.) We should note that in recent years it has become apparent through brain sectioning of deceased people with autism (Bauman, 1999) that there are discernable neuro-anatomical differences between the brains of autistic and typical people that account for some of their atypical behavior.

The behavioral approach made no assumptions about the sources of autism or the inner life of the child. Workers simply addressed the aberrant behavior which the children presented with the tools of learning theory—"reinforcing" with rewards of food or praise desired behaviors and attempting to "extinguish" with "turning away" or "time-out" or aversive procedures, those behaviors which they viewed as unacceptable. The behaviorists assumed that if they could get the disordered child to *behave* like typical children, then, indeed, that child would be typical. In other words, "If it walked and quacked like a duck, it was a duck." (At some of my lectures I address this argument by introducing a very realistic, battery-operated duck that waddles and quacks. I then comment that while this duck performs like a duck you would not want it for dinner).

Applied to autism, many of the children may—with behavioral training—present the *outer* appearance of language in that they speak perfectly articulated words. Unfortunately, they often show little or no understanding of what they are saying and have great difficulty generalizing what they have learned to other contexts. Similarly, many of the children may appear to read but have little or no understanding of what they are reading. In short, the duck metaphor often used by behaviorists dramatizes the importance of Werner's (1937) distinction between underlying process and external achievement.

COGNITIVE-DEVELOPMENTAL (C-D) SYSTEMS THEORY

Cognitive-developmental (c-d) systems theory began with Werner's developmental theory and evolved its own structure over the last 3–4 decades under the

pressure of finding solutions to the formidable challenges confronted by children on the autism spectrum. While the Werner and Werner and Kaplan developmental formulations were of great value in providing a framework for placing the strange behavior of the children in a developmental context, some formulations did not further our goals. As one example, consider the "law of pars pro toto" (Werner, 1948, p. 423) "that each part belongs in essence to the whole, and has a reciprocal effect on the totality." While the "pars pro toto" principle permits rapid recognition of an early form of functioning in which both typical and autistic children react to part of a situation as if it were the entire situation, it does not explain how this kind of functioning develops or how it might be transformed into more advanced functioning.

There is also a large, unresolved question with regard to the relation between levels. Specifically, how do children advance from sensori-motor to perceptual and conceptual levels of functioning? While typical children achieve this without difficulty, children with autism tend to be stalled at earlier levels so the issue of how this occurs is far from academic. Werner—in discussing the goals of developmental psychology, states,

> ...developmental psychology has two basic aims. One is to grasp the characteristic pattern of each genetic level, the structure peculiar to it. The other, and no less important one, is to establish the genetic relationship between these levels, the direction of development, and the formulation of any general tendency revealed in developmental relationship and direction. (Werner, 1948, p. 5)

Werner clearly succeeded in the first aim of describing characteristic patterns of each developmental level. The success of his second aim—establishing the genetic relationship *between* levels—is more problematic. He certainly has not indicated what process children must go through to move from one level to the other in a way that might provide guidance in trying to help children stalled at the sensori-motor level advance to the next level. Werner and Kaplan (1963, p. 14) touch on the issue of how this occurs by invoking the principle of "functional shift" to account for the child's transformation from dealing with the world in terms of "things-of-action to objects of contemplation." Unfortunately, there is no specification of how "functional shift" works or how to bring it about, so we are left with an excellent description of an important step in the child's development but without the means of helping the child get there. At a Clark colloquium in 1959, asked about how children made the shift from one level to the next, Werner replied that he viewed the appearance of each more advanced levels as an "emergent" that could not be predicted by the nature of the earlier level.

Nevertheless, Werner readily accepted and supported my dissertation proposal, the first at Clark to study the relation between levels—specifically between sensori-motor action and verbal meaning. A summary of this study which became one of the cornerstones of our work with children on the autism spectrum, follows:

> To study the effect of action on word meaning I used the "lapse of meaning" phenomenon which occurs when any word is repeated at approximately 3 times per second for 6–7 seconds. Under those conditions people report that the word turns to "jargon" and becomes separated from its referent. To determine whether we could influence the rate of lapse of meaning with body actions performed while the subjects were saying a word, we required 16 subjects (typical college students) to rapidly repeat the words "push" and then "pull" while actively pushing or pulling a spring-loaded drawer.

The results showed that when repeatedly saying "push" while synchronously pushing the spring-loaded drawer or "pull" while pulling the drawer (concordant condition) that the spoken words maintained meaning significantly longer than in a *discordant* condition where the word "push" was paired with a *pulling* action or the word "pull" was paired with a *pushing* action. However, some subjects in the *discordant* condition were able to overcome the tendency toward more rapid loss of meaning when saying the word "push" while performing pulling actions, by viewing their actions—not as pulling—but as *push*ing toward themselves.

These findings suggested the manner in which earlier action stages interacted with spoken words and how—when the spoken word was losing its meaning—the person drew on the available action meanings in much the same way that an aphasic person (Head, 1926) at first unable to retrieve the term "scissor" could do so after simulating cutting something with scissors (Head, 1926).

Sign, Symbolic-Sign and Symbol Stages of Development

Guided in part by my dissertation findings, we sought and developed ways to help children on the autism spectrum progress from earlier to more advanced stages of functioning. The study of sign or signal functioning of children and how this contributed to their formation of coherent systems of behavior was critical in this effort.

The infant—as Werner pointed out—develops from a largely stimulus-dominated organism (our *sign stage*) to one capable of representing reality to self and others (*symbol* stage) as the culmination of a series of liberations from the "pull" exerted by the child's immediate surroundings. The terms *sign, symbolic-sign, and sym*bol characterize different stages of liberation not only because they capture a central determinant of the child's reality during each stage, but because so ordered, the stages suggest an element of continuity essential to development. The stages are qualitatively distinct—with each stage being prerequisite for the next—but the prior stages also actively contribute to the achievement of later stages. Thus the sign stage contributes to the development of the symbolic-sign stage, just as the symbolic-sign stage contributes to the development of the symbol stage. Since a central aspect of the theory—on which all else builds—is the concept of systems,

the next section will describe their nature and how they come into play at two stages of development.

The Nature of Systems at Two Stages of Development

Systems are organized, coherent "chunks" of behavior involving objects or events. Systems play different roles in the child's economy depending on the child's stage of development. For example, at the *sign stage*, systems tend to dominate the child's functioning while at the *symbolic-sign stage* systems are exploited by the child to serve certain goals. This distinction is evident in the behavior of two 3-year olds—one typical and one autistic—when they are given a pile of blocks with which to play.

Jack, a Typical 3-Year Old at the Symbolic-Sign Stage

As soon as Jack received the pile of assorted blocks, he began to build a connected structure of ramps and towers. He picked up each block, examined it, selected a place for it in the structure and inserted it carefully. Needing a block of a particular size, he scanned the blocks and spotted an appropriate one near the foot of the observing adult about six feet away. He looked at the adult, pointed at the block, and exclaimed, "Block, please!" After receiving the block, he smiled at the adult, added the block to his structure, and took another block. Next, while making "rmm" car sounds, he "drove" his block up the ramp and around the block towers. Finished with car-block play, he got up and set off for something else to do.

Bert, a 3-Year Old on the Autism Spectrum at the Sign Stage

Bert, seeing the pile of blocks, immediately began to build a connected structure. But, unlike Jack's construction, his consisted only of a row of rectangular blocks carefully placed so that each block abutted the previous one. Curved or triangular blocks were not considered, and he did not make sounds that other children made as they played.

Bert worked with rapid intensity, regularly scrambling from the end of the row of blocks to get another so that he could continue extending the structure. At no time did Bert acknowledge the existence of the adult seated nearby. When the adult tried to hand him a block, Bert rapidly turned his body so that his back was between the adult and the blocks. When the adult removed a block from the row, Bert screamed, then frantically sought another block to close the gap in the structure. Bert continued to extend the line of blocks until it reached the wall. Confronted by the wall, he made a right angle with the next block and continued placing blocks along the wall until there were no more blocks. Then, he began rocking back and forth while twiddling his fingers in front of his eyes. Except for his scream when the adult altered his block structure, he uttered no sound.

An Analysis of the Children's System Functioning

Although both Jack and Bert produced systems, their systems differed dramatically. Jack, the typical child, had a complex, integrative system composed of action with towers, ramps and cars. As Jack played with the blocks, it became evident that he experienced himself as the executive or master-builder with an inner plan to which both the blocks and the adult contributed. This allowed him to form a complex, integrative system with the blocks (towers and ramps) that he could exploit in different ways. He could, for example, turn a block into a car and move it, car-like, up and down the ramps. He could also turn from the main block structure to request a block from an adult and turn back to his structure without losing touch with his goal. In carrying through his plan, Jack demonstrated that he could integrate several smaller systems into a larger one.

In sharp contrast, Bert, the autistic child operating at the *sign stage*, had a single, mini-system composed of lining up blocks. Bert's system was not driven by any inner plan but by the way the rectangular end of each block signaled the need to abut the next one. He changed the structure only when the physical barrier of the wall required such a change. This change, however, came about not through any executive decision on Bert's part, but because the wall required the change. Finally, there was no decision to stop connecting blocks; Bert stopped when he ran out of blocks. When this occurred, he had no means of directing himself to a new activity. Apparently, the only means he had of filling the void left by the end of the block-connecting system was rocking and hand twiddling.

The different way the children related to the observing adult illuminates the extent to which they dominated or were dominated by their systems. Jack, needing a block to complete his block structure and seeing a block near the adult, was able to turn toward the adult and ask for it. In doing this, he creatively brought together the world of relationships with people with his world of objects. The situation was very different for Bert. For him, the observing adult did not exist except as a momentary threat (when removing a block from his lined-up blocks) to the integrity of the structure being built. Clearly, he lacked the executive function required to draw upon relationships with people. Stated differently, his sign stage functioning precluded people from being part of his systems.

After children make the shift to the symbolic-sign stage, their relation to the systems they have formed changes radically. *Systems previously triggered only by properties of the environment are now at the disposal of the child.* The distinction between systems that dominate the behavior of children and those which children dominate, is evident in the comparison of Jack, who has made the shift to the symbolic sign-stage, with Bert who has not.

Essentially, the discussion of Jack's and Bert's systems relate to their different spheres of reality (Werner, 1948) or ***Umwelten*** (Uexkull, 1926) within which the children lived. Clearly, the sphere of reality for Jack was much larger, more differentiated and people-related than was the case for Bert. To further develop this kind

of analysis for children on the autism spectrum and other developmental disorders, we established an umwelt assessment procedure.

The Miller Umwelt Assessment

Uexküll (1934/1957) introduced the concept of the ***Umwelt***—or "world around one"—to demonstrate that each species of animal or insect has its own world. Further, that the organism's physiological structure dictates what it can take in from its immediate surroundings and what is invisible or irrelevant to it. Werner (1948, p. 382) applied this concept—which he referred to as "spheres of reality" to the world of children and with Martha Muchow studied how the child's sphere of reality differed dramatically from that of the adult. We adapted the umwelt or sphere of reality concept (Miller & Eller-Miller, 1989, 2000) to our work with children on the autism spectrum. In doing so we reasoned that if we could assess the spheres of reality within which these children lived and functioned, we would be better able to intervene with them to expand their realities.

We did this by presenting a standard environment with people and objects present. With this in place, we could assess the child's relative emphasis on things in contrast to people, things used with people, as well as their use of space. Then, a series of tasks were introduced to sort out different aspects of the child's umwelt. Since among children with autism the issue of interacting with people is central, the first umwelt task assesses this capacity.

Assessing Interactive Capacity: The Suspended Ball Task

Figure 1 illustrates the various umwelt possibilities. Figure 1a, for example, represents a child enjoying a repetitive pushing-ball game (child-object-adult system) in which child and adult playfully push a suspended ball back and forth. The dotted lines to both ball and adult indicate that the child's system includes awareness of both the ball and the adult. Figure 1b reflects a more limited child-object system that includes the ball which the child pushes whenever it arrives, but does not include the adult. Figure 1c shows an even more circumscribed reality. Here, the

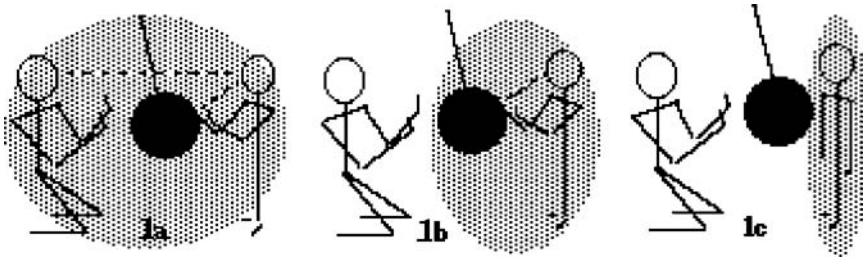


Figure 1. The suspended ball task reveals different interactive spheres of reality.

child fails to react even when the ball bumps into him/her, leading to the inference that in that child's umwelt that object either does not exist or is irrelevant.

Among children with autism, another major issue concerns their difficulty adapting to changes in their surroundings. Accordingly, the umwelt assessment includes tasks which examine this issue.

Assessing the Capacity to Adapt to Change: Stacking Cups and Bowls

Successfully coping with surroundings requires the child to adjust his/her approach to changing circumstances. To get at this capacity during the Umwelt Assessment, the child is required to stack cups and bowls in different ways. The task is graduated from simple stacking of cups (then bowls) with their openings facing upwards to those involving progressively more complex adjustments. At the most complex stacking level, the child is required to alternately stack cups and bowls, with the cup presented upside-down over the bowl and the bowl presented right-side-up over the right-side-up cup (asymmetrical stacking (Figure 2).

The final sequence tests the child's ability to shift from a vertical stacking mindset to a lateral one in which he/she is required to place a cup in each of six bowls spread out in front of the child (Figure 3) Closed system children—those rigidly preoccupied with objects—typically show such a strong perseverative tendency that they persist in vertically stacking the cups given them instead of placing a cup in each of the bowls spread out in front of them even after the examiner has modeled placing one or two cups in the bowls. Often, we will repeat the set-up in Figure 3 with additional cues to determine how close a child is to making the shift from one kind of organization (vertical stacking) to another (lateral). For those children who cannot make the shift, we infer an umwelt in which deviation from what is given in the environment is unacceptable.

Figure 2. Asymmetrical stacking of cups and bowls. P. 254 in Ritual to Repertoire.

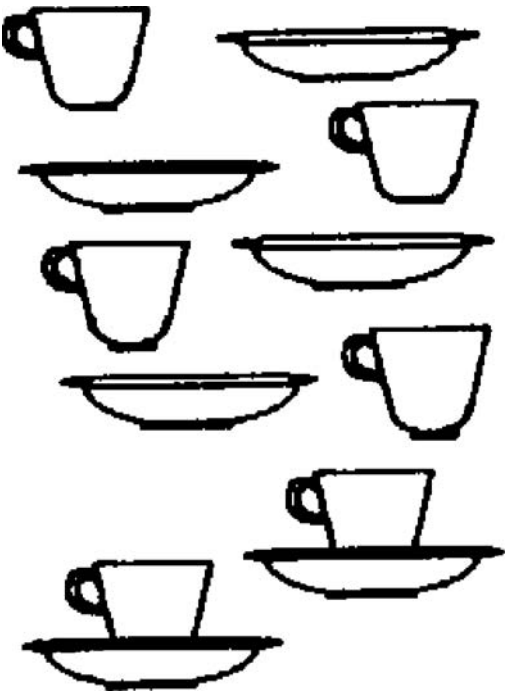


Figure 3. Breaking the vertical set.

Problem Solving and Learning from Experience: The Elevated "Swiss Cheese" Board and the Rake-Obstacle Task

The next two tasks examine, although in different ways, the child's ability not only to adjust to changing circumstances but to learn from experience. One task examines the child's response to the Elevated "Swiss Cheese" Board (Figure 4) another, called the Rake-Obstacle task (Figure 5) examines the child's manner of coping with progressively more demanding tasks involving the use of rakes and obstacles to gain a desired object.

The ability to learn from experience comes into play when the child on the "Swiss Cheese" Board inadvertently steps in a hole (care being taken that the child does not fall or get hurt). Then, as the child continues to cross the board, we are able to determine if the child now avoids holes by stepping over or around them. What the child does in this situation allows us to make inferences as to whether or not the child's umwelt includes space near the body (holes) and whether the child is able to retain such events (stepping in hole) and adjust accordingly.

In the rake-obstacle task, we determine if the child—shown in Figure 5 unsuccessfully pulling a desired object toward himself—can learn to push it away through the gap in the horseshoe-shaped barrier and then toward himself. When a child insists on pulling the object toward himself—as in Figure 5—in spite of the

Figure 4. (Swiss cheese Board) p. 223, ritual to repertoire.

barrier, we test the limits by placing the desired object closer and closer to the gap to determine at what point the child grasps the need to first push the object *away* before it can be brought closer. Once the child succeeds during testing of the limits we return the object to the center of the horseshoe ring to determine if the child has generalized his understanding. If he has, he pushes the object toward the gap; if not, he reverts to the unsuccessful effort of trying to directly bring the object toward himself. Obviously, the child who learns from testing of the limits has an umwelt capable of expansion.

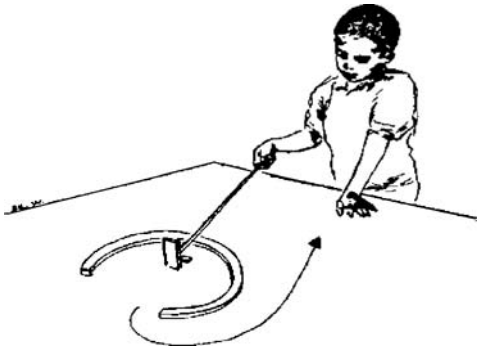


Figure 5. Rake-obstacle task, p. 245. From ritual to repertoire.

Parent-Child Bonding

Among the tasks introduced during the Umwelt Assessment is one suggested by Ainsworth et al (1978) which examines the extent to which a child with autism has a relationship with his/her mother. At the end of the assessment, the parent says goodbye and leaves the child with the examiners. The child's response—or lack of it—indicates the nature of the bond between child and parent. In present terms, it suggests whether or not the mother continues to exist for the child once she is no longer physically present. Once insight is gained about how the child functions within his/her Umwelt, interventions most likely to help the child progress are planned.

Since most children come to the Center functioning at the sign stage—where they are quite dominated by stimuli in their surroundings—it is important to design interventions that address this issue. Central to this effort is an analysis of the sign stage, how systems form at this stage, and how they may be expanded to address the children's issues.

Sign Stage Functioning

The sign stage (from 0 to about 18 months for typical children) may continue much longer for children on the autism spectrum. The term *sign* characterizes the initial stage of development because the first functional systems form through signs or signals; Werner's (1948, pp. 59–67) thing-of-action properties in the environment.

All signs or signals have in common certain properties. First is their *imperative* nature. The mobile above the crib acts as a sign that *requires* the infant to form a system with it just as the sign properties of wooden blocks *required* Bert to form a system which entailed juxtaposing one block next to another. Signs demand an *immediate* response as evident in Bert's scramble to get another block to continue the system. Second, signs entail a *single-track* response; that is, the sign's "meaning" relates to one particular action outcome. In Bert's case that meant adding blocks,

Unlike typical children, those on the autism spectrum as well as those with other developmental issues, show system aberrations—such as those elicited from the Umwelt Assessment—that interfere with their performance and development. They may, for example, tend (like Bert) to become so over-involved with things and events that they are unable to detach from them, as does the child who feels compelled to repetitively flick on and off light switches or television sets. Alternatively, these children may be so uninvolved or disconnected from things and people around them, that there is little basis for building or sustaining systems with either things or people. This means that before such children can progress, careful attention must be given to their system problems.

A number of important changes occur gradually during the sign stage among typical—but often not among autistic children—which seem to "loosen" the imperative aspects of signs and, in so doing, contribute to the symbolic-sign stage. One such change during the first 12 months of life is the progressive awareness

and organization of the body so that self-directed movement involving objects with people becomes possible. As this develops, the child has repeated opportunity to discover that objects as well as people have an existence independent of the child's actions toward or with them. After the independent identities of both body and objects have been established, the newly mobile child learns during the next 6 months to cope with an expanding reality. During this latter phase of the sign stage, systems grow in complexity as the typical child explores the different properties of objects and the space within which these objects exist. The child now forms systems entailing putting one object inside another, moving an object from one hand to another, putting things together and pulling them apart, and traveling from one object or event to another.

The hallmark of all systems is the investment the child has in maintaining or continuing them. This investment becomes apparent when a particular system is *interrupted.* For example, a 15-month-old child involved in a system of putting on and taking off a series of bracelets on her arm became very distressed when a bracelet was taken (system interrupted)—crying, pointing at the desired bracelet and even trying to say the word—in an effort to have it replaced on her arm to restore the interrupted system. As discussed later, the careful interruption of systems is an important technique for helping children initiate actions or words to help repair their "broken" systems.

Interrupting systems is also used to motivate a child. For example, one child who at first refused to use a rake to get a disc that was out of reach, did so when the therapist proceeded as follows: First the therapist helped the child establish a disc-in-bottle system by having the child repeatedly put discs in the slit on top of a bottle until the child did this completely on his own. Then, the therapist interrupted this system by placing the disc out of the child's reach while placing the rake between the child and the disc. At this point, the child immediately used the rake to bring the disc closer so that he could restore the interrupted system by continuing to place the discs in the slit on top of the bottle.

Also evident is the typical child's new ability to *spontaneously expand* his or her relations to objects or events—an ability that is either not present among children with autism or present only to a very limited extent. Piaget (1952) vividly describes such a spontaneous expansion: His infant son, in the course of waving his arms while holding an implement, happened to hit the bassinet's wicker cover, making a distinctive sound that he subsequently tried to reproduce by waving his arms in the same manner —*but closer to the wicker cover*. A bit further along in development, we observe the 10-month old baby, no longer satisfied with merely dropping the spoon from the high chair and watching its descent, now varies the hand position to observe how this shift relates to the landing site. This new flexibility goes well beyond the unrelenting disposition to simply react to what the signal properties of objects seem to require and is notable for its absence among children with autism.

Still another important change—evident among typical children but often not present among autistic children—is the child's new ability to coordinate objects with people (Trevarthen & Hubley, 1978). This new flexibility, coupled with the

independent awareness of body and object—and the possibility of one relating to the other—makes the advance to the next stage possible. Since this advance depends on the formation and expansion of the child's systems, it is desirable to share our understanding of how systems form and are expanded during the sign stage.

System Formation, Maintenance and Expansion During the Sign Stage

Orienting

Systems begin to form as a salient sound, motion, or a particular property of an object, event or person induces the child to "turn toward" or orient, toward the source of the stimuli (Goldstein, 1939; Pavlov, 1927; Sokolov, 1963). Orienting has been shown to make the stimulus that the child is turning toward more salient for the reacting child. However, even at this initial phase of system formation, aberrations are evident among many children on the autism spectrum. For example, some of these children are so driven that they orient to any stimuli that they see, hear, or feel in a way that keeps them helplessly driven by so many competing stimuli that they have difficulty with the next step in system formation—engagement.

Engagement

Once a child orients toward a salient stimulus, the next step in system formation entails the child moving toward and becoming physically and emotionally involved or engaged with the stimulus properties of the object, event, or person in his/her immediate surroundings. Here, the "thing-of-action" and physiognomic properties of objects (p. 72, Werner, 1948) plays a role in facilitating engagement with the object or event.

In our terms, orienting plus engagement provides the precondition for the formation of systems which, in turn, provides the framework for not only making functional contact with things and people, but for maintaining and expanding that contact. However, engagement by itself does not ensure the development of a system.

From Engagement to System Formation

Engagement is to system formation as a casual encounter is to a life-long friendship. The initial encounter (engagement) is a necessary prerequisite for a relationship (system) to develop between people or objects, but such a relationship may or may not develop from the initial encounter. The system develops only through a more *prolonged and repetitive* encounter with an object, event or person.

The decisive indication that an internalized system has developed, occurs when, following interruption of the system, the child becomes driven to compensate by trying to maintain or restore that system. When interruption of an activity does not induce a child to continue or restore that activity, a system has not yet

developed. Among children with autism, systems formed with objects or events may be so encompassing that they are often unable to extricate themselves from them without assistance. However, if systems are to move beyond mere rituals there must both be a means of recalling or reactivating them when they have not been used for a time and a means of extending their influence to other aspects of a child's surroundings. Two principles—inclusion and extension—suggest how this occurs.

The Inclusion Principle

The inclusion principle accounts for how—among both typical and autistic children—one part of an event can trigger reactions previously triggered by the entire event (Werner's ***pars pro toto***):

> Whenever the child engaged by a stimulating object or event, is concurrently stimulated by a (back)ground aspect of the situation, the (back)ground aspect soon becomes part of the total, engaging system which emerges. Subsequently, when only the (back)ground part appears (partial interruption), the child compensatorily behaves as he/she had toward the originally engaging object or event (Miller & Eller-Miller, 1989, p. 155).

This principle accounts not only for the manner in which a buzzer sound or a flashing light can induce salivation and eating behavior in Pavlov's experiments with dogs (1927; 1928; 1962), but for the manner in which spoken words or gestures first assume the capacity to guide the behavior of small or disordered children. All such new behaviors occur—not because the organism connects two discrete entities, e.g. buzzer sound with food—but because it inadvertently *transforms* the new input into one that is subjectively experienced as part of the original event.

Only in this way can one account for the finding, for example, that when Pavlov's dogs after conditioning were presented only the flashing light or buzzer sound "the animal may lick the flashing electric bulb... or try to eat the sound itself; in doing this the animal licks its lips and grinds its teeth as if dealing with real food." (Pavlov, 1962, p. 89).

For an example of the inclusion principle at work with a profoundly autistic 14 year old boy who, although nonverbal, had learned to share his thoughts in writing, the following comment by Tito (Blakeslee, 2002) is instructive—at 4, he was looking at a cloud when he heard someone talking about bananas. It took him years to realize that bananas and clouds were different.

Tito's comment shows how unrelated auditory input becomes experienced as part of an engaging visual system (looking at clouds) simply because it accompanied that system in much the same way that Pavlov's dogs inadvertently included the buzzer sound in their experience of food.

We exploited this part-whole fusion tendency to help Stanley, a 7-year old autistic boy with an unremitting insistence that his mother wear only long sleeve shirts or dresses. When summer came and mother attempted to put on a short

sleeve dress, the boy would have a major tantrum until she yielded by donning a long sleeve outfit. The problem was resolved by having mother wear a short sleeve shirt while placing an inch wide band of cloth around both her wrists (at the level that a long sleeved shirt would reach). Seeing this, Stanley was perfectly content to accept mother wearing short sleeved shirts. Subsequently, the band was reduced in size and finally removed entirely without further tantrums.

For Stanley, mother's change from long to short sleeved outfits was intolerable because by changing this one part of her garb she became unfamiliar to him. However, once the cloth band was placed around her wrists, it immediately became part of the long sleeve system and was sufficient to restore her to her familiar self.

Value of the Inclusion Principle

The inclusion principle is important for our work because it provides a means whereby children's systems might be expanded to include previously unrelated material such as spoken words and manual signs. As the following will show, the inclusion principle was being successfully applied with nonverbal autistic children even before it had been fully formulated. However, it may be interesting for the reader to note how our efforts with autistic children over the years led—through observation and developmental inference—to the inclusion and extension principles as well as to other formulations.

WORKING WITH CHILDREN OF THE AUTISM SPECTRUM: EARLY EFFORTS (1965–1973)

As we began to work more intensively with children on the autism spectrum in the mid-sixties we were struck with how little the children seemed aware of themselves and of others. Unlike typical children, those on the autism spectrum have issues which seriously interfere with their establishing a strong sense of their own being. Of these, among the most important is the poor sensory transmission and/or processing of input from various parts of the body. The result is that they may have difficulty locating pain on their bodies and—in severe cases—may lose the sense that they have a body. Tito was able, eventually, to write about this feeling of "body loss" and how he sought to cope with it.

> When I was 4 or 5 years old, "Tito wrote while living in India," I hardly realized that I had a body except when I was hungry or when I realized that I was standing under the shower and my body got wet. I needed constant movement, which made me get the feeling of my body. The movement can be of a rotating type or just flapping of my hands. Every movement is a proof that I exist. I exist because I can move. (Blakeslee, 2002)

In addition to constant movement to establish a sense of the body, we noted that some of the children seemed driven to seek "edge experiences." One 5-year

old girl (Miller and Miller, 1973) would consistently hang by her finger tips outside her third story window till neighbors raised the alarm; another sought to climb as high as possible. Recently, a young man (Shore, 2000) who had largely recovered from his autism, described how as a child he would climb to the highest branch of a tree that could barely sustain his weight and cling to that branch as it swayed back and forth 40 feet above the ground. He described himself as both terrified and exhilarated by the body sensations he experienced. In such instances we infer that the children on some level were trying to compensate for their lack of body awareness, by seeking these "edge experiences." Following Werner we felt that until the children developed ongoing awareness of their bodies as distinct from but related to the world—body-world polarity—that there could be little progress toward development.

Our first efforts, therefore, were directed toward trying to establish this polarity by breaking through the children's encapsulation. In one rather sterile but orderly school at which my wife and I were consulting, we observed the children drifting, rocking and twiddling their hands without any apparent awareness of who or where they were. Appalled by their "zombie-like" quality, we sought to "shake things up" by emptying drawers of the children's neatly folded clothes on the highly waxed floor. We were pleased to find that some of the children came alive long enough to help restore the clothes to their original locations.

The Introduction of Elevated Boards with Obstacles

Searching for other ways to help the children become more aware of themselves and directed in their actions, we were fortunate to observe the conditions which led one autistic child to shift from profound self absorption to what seemed like more self aware behavior. This child was religiously rocking as he slowly approached a large ditch dug for a water main at a facility at which we were consulting. This ditch had been partly filled in with some large rocks while other large rocks were placed near the sides of the ditch. As this 8-year old autistic boy stumbled across one of those rocks he began to work his way from one rock to another alongside the ditch to rocks which—by their placement in the ditch—induced him to step from one to the other until he had crossed the ditch. When he got to the other side he promptly turned around and returned the way he had come.

We were struck with this child's shift to purposeful action as he deliberately picked his way across the ditch. To get him to replicate that behavior, I placed a nearby plank across the ditch and guided him gently on it. After a sharp glance at me, he walked across the plank with the same directed intensity with which he had first crossed the ditch.

On the basis of these and similar observations, we started having the autistic children with whom we were working at our Center, cross planks between tables, 2.5 feet above the ground. Invariably, at first, the children would look at us, then down at their feet—as if to say, "What am I doing here?" Then, with minimal

support they would carefully walk across the elevated plank. (Later we discovered another property of the elevated boards for these children: Many who toe-walked on the ground would walk quite normally with heel and toe when elevated). We soon complicated these crossings by extending the planks so they made a partial circuit of the room and by adding certain obstacles that the child had to confront to go under, over, around or through to cross from one table to the other. Following this, we begin to introduce manual signs and words to accompany the actions the children performed on the boards. The use of manual signs on the boards and on the ground derived directly from my previously described doctoral dissertation (Miller, 1959; 1963) on the effect of action on word meaning.

Noting the positive effect of action and gesture on spoken words, we sought to strengthen the children's ability to find meaning in common action words like "pick up" "drop" "open" "close" "come" and so forth, by pairing these words with gestures that closely resembled the actions. Just as my dissertation demonstrated the influence of body action on spoken words, so we began to find that action and gesture paired with the spoken words we introduced enabled the children for the first time to find meaning in spoken words and gestures which were previously meaningless to them. (Here, we were applying the inclusion principle although it had not yet been fully formulated). We also worked on generalizing these words and actions to the children's functioning on the ground. Indication that spoken words were beginning for the first time to convey meaning to the children was evident as they began to turn expectantly toward us for the next sign-word command needed to guide them over one obstacle or through another. Soon parents began to report that their children were showing increased awareness of both them and their surroundings and were following verbal directions in a way they had not seen before.

We increased our population to 19 nonverbal children with autism from various institutions who, when tested, were found unable to respond to 50 simple verbal requests. We then introduced action and gesture signs paired with these spoken words both on the elevated boards and the ground with them over a 14-month period. On retesting the children at the end of this period, we found that all 19 children could now follow a median of 27 words with signs and a median of 26 words presented *without* sign support. Accordingly, just as in the lapse of meaning study, spoken words took on the meaning of the signs and actions and could now guide the children. Further, for several of the children their use of signs seemed to "pull" spoken words. Results of this first published article on the effect of elevation and signs (Miller and Miller, 1973) has since been replicated (Konstantareas, et al, 1977; Konstantareas, 1984) and led to increased use of manual signs paired with spoken language in schools and clinics for children with autism in the United States and other countries.

Looking back on this study, we now view the inclusion principle as the major source of the positive results. When we paired spoken words and manual signs with the actions the children were performing, the children began to experience the spoken words and manual signs as part of their action-object systems. In other words, as we stated in our book (Miller and Eller-Miller, 1989, p. 157).

> The "error" of incorporating... an alien word occurs because the engaged child's single-track functioning requires the processing of both the salient event (performing action with object) and any secondary pattern accompanying that event (the spoken word and manual sign) as if they both came from the same source. *The child functioning in this way is literally unable to discriminate between the two sources of concurrent stimuli, whether they impact the same or different sense modalities.* It is this inadvertent "error" that allows the spoken words and signs to assume significance previously restricted to the action-object system itself. Then, when the spoken word (or gesture) is presented alone (partial interruption) the child needs to enact the action-object part of the system in order to complete it.

The effect on children, who incorporate words within their action-object systems in the same way that animals incorporate previously unrelated stimuli, is that sign-words develop that require the child to produce the action now experienced as part of the word. It is this expanded sign system that required a typical child (McNeil, 1970) to walk after saying "walk" and "blow" as she blew her nose. However, as we shall see later, with words related to objects, the situation is somewhat different.

In spite of our success with the use of elevated boards with signs and words, after a time certain limitations became apparent. There were, after all, only a limited number of action concepts that could be established on the boards and while the children continued to perform the various tasks in response to signs and words, they did so in a ritualized manner without their original alertness. At first we fought this ritualization process by constantly introducing new board sequences and structures to maintain the "edge experience" and the increased awareness we first saw with its use. However, accepting gradually, that with repetition of actions on the boards, these actions would inevitably become rituals, we decided to study the ritual-forming process, itself, to see if it could be helpful in advancing the functioning of children on the autism spectrum. This study of rituals eventually led to the formulation of the system concept.

ORDER AND DISORDER: EXPANDING AND DISRUPTING RITUALS (1973–1977)

A ritual in its most general dictionary sense is "Any detailed method of procedure faithfully followed." For children at early stages of development rituals are "fixed" ways of doing things for having their needs met. Once established, typical children resist any effort to modify them. By examining early rituals among our own children as well as those described by Werner it became apparent that the tendency to form and maintain rituals was characteristic of early normal development. Further, that when rituals were formed, the child's dominant need to carry through the ritual as a total unit seemed to eliminate independent access to any particular part of the ritual.

A specific example of this kind of behavior was described by Werner:

> At the age of 2:8 years, the Scupin's child regularly noticed, long before his parent's attention had been attracted to the fact, the removal of some small object from one place to another, or any other minor alteration in the arrangement of the room. It often happens that children are painfully overcome when their customary routine is changed. "When his mother made bold to put his toy away in another place than the customary one, he sprang hastily from his chair, and said: 'You can't do that, Mama!' He then tore it from her hand, and returned it to exactly the same spot where it had been before. (Werner, 1948, p. 131)

This description of how a typical 2.8 year-old child functions has features in common with how an older child on the autism spectrum might behave. Insight into the *formation* of rituals began as we observed a 5-year old girl with autism who had previously not been able to complete a sequence (walking up steps, crossing a plank suspended across the steps, going down steps, crossing open ground to another set of stairs, etc.)

For a time this child had been able to complete by herself only part of the sequence; the part where she was guided by the steps and the elevated plank to the other set of steps. Only when she stepped on the ground where there were no boards to guide her, did she seem to lose the connection to the steps at the other end of the board. However, after repeatedly taking her hand as she stepped to the ground and guiding her from one set of steps to the other, she one day stepped to the ground, turned toward the other set of steps, and *without support* walked to that set of steps and completed the entire sequence. From then on, whenever required to do so, she could perform the entire ritual—both elevated board and ground part—completely without support. This child's behavior suggested that while rituals (which we began to call systems) might be induced by the vector of the board guiding the child from one place to another, a system could also be established on the ground simply by repetitively guiding the child with autism through a desired sequence of behavior until it "took" as a totality. The elevated boards with various obstacles continued to be useful in both focusing and challenging a child to problem solve (and for conducting the Miller Umwelt Assessment) but were no longer the only means of establishing systems (rituals). This new understanding permitted us to rapidly multiply the number of systems that a child had at his or her disposal: We could establish big body systems (climbing up and down steps), small body systems (putting cups on cup hooks or picking up and dropping something), interactive systems (giving someone one object in exchange for another) or more complex integrative systems which combined a number of mini-systems in service of a particular goal (climbing up steps to go down a slide or opening a cupboard to put something inside).

In each case, a system was considered fully established when—following a number of hand-over-hand repetitions—the child could perform the activity without support. We also drew on physiognomic properties of objects to induce the

children to create new rituals. Once achieved, these ritual-systems and the signs and words which became part of the systems, added greatly to the child's repertoire of action-object meanings. Viewed another way, if each new ritual was a predictable chunk of reality for that child, then by developing new rituals (systems) we were increasing the child's capacity to perceive and cope with different aspects of reality.

Introducing "Mild" Disorder by Expanding Systems

By introducing "mild" disorder to a child's system, we sought to alter and thus build a new flexibility into the child's system without fear of a major "meltdown." We found four aspects involved in every system that we helped a child form: There was the **p**erson who introduced the system, the **l**ocation of the system, the action or **o**bject used in the system and the **p**osition with which that action or object was introduced. With some children on the autism spectrum, change in any one of these aspects was sufficient either to stall the system or trigger major upset. For example, a child who had first established a system with a particular staff person might well refuse to perform that system with another. And, for some children, a shift in the location of a system—by even a few centimeters—was sufficient to trigger a catastrophic tantrum.

However, by proceeding cautiously and introducing only changes that the child could tolerate, we succeeded in reducing the children's victimization by their systems. The acronym **plop** reminded workers of the expansions or changes required for each system. To illustrate how **plop** expansions were introduced, consider this mini-system: *putting cups on hooks* in which the therapist or teacher gives the identical cups one at a time to the child who places each cup on a hook. The system was fully formed once the child could place the cups on the hooks without assistance. When the child could do this, the first expansion—changing the *person* who was giving the child the cups—was introduced. (Only one expansion at a time was used). If the child tolerated this change, we would introduce a *location* expansion by having the child perform the cup on hook task at another site (at first not too far from the original site). Following this, we might introduce an *object* expansion by giving the child different kinds of cups to place on the hooks. And, finally, we might vary in random order the *position* in which the object was given to the child (offering the object to the left, right, up and down). Once these expansions were accepted as part of the cup-on-hook system, we might split the system by having the cups at one location and the board with cup hooks at another (or vice versa). A child who could tolerate all these mild disruptions and expansions of the original system had begun to loosen the bonds of the total system.

These artificially induced expansions substituted for the spontaneous expansions achieved by typical children at an earlier age. In doing so, it enabled children on the spectrum to generalize what they had learned at the Center to totally novel settings at home and elsewhere. However, at home, when presented with part of a system, such as the cup, the child still found it necessary to reproduce the *entire*

system (searching for cup hooks) as established at the Center. Further, because each system existed as an independent totality, when the children left one system for another, it was as if the first system no longer existed. Our next goal, therefore, was to find a way to help the children move freely within their systems—for example, to experience a cup not only as something to hang on a cup hook but as something to drink from, to stack, etc., and to learn how to connect one system with another.

Introducing "Moderate" Disorder by Interrupting Systems

As Werner pointed out, the capacity to act intentionally depends on the establishment of a polarity between subject (the child) and the object:

> The first glimpse of a polarity between object and subject happens when the child begins to use parts of his own body to master the situation. The employment of instruments—even if they are simply his own legs and arms—indicates a certain release from the domination of the concrete field . . . in which object and subject are fused virtually into one. (Werner, 1948, p. 192)

The importance of interruption had previously been underscored by Bluma Zeigarnik (1927) in a classic series of experiments on memory. However, there was another aspect of interruption that Werner did not develop in his thinking but that was implicit in Piaget's (1952) observations, i.e., the need of the children—once a system was interrupted—to maintain or reestablish that system.

We had begun to develop cognitive-developmental systems theory in a way which allowed us to refer to all such behaviors by children in response to interruption as **compensatory actions** (Miller and Eller-Miller, 1989, p. 19) to repair and maintain disrupted systems. We now sought to apply our new understanding of systems to help children who were so encompassed by their systems that they could not detach from them or connect one system with another in service of more complex exploration of their surroundings. In other words, we sought to artificially establish the capacity to detach from and move between systems to parallel the manner in which typical infants begin to achieve this (Piaget, 1954) as early as 7 months of age.

We viewed compensatory actions triggered by interrupted systems as an important means or enabling children to extricate themselves from the domination of their systems and to move toward intentional functioning. This was possible because both compensatory *and* intentional action share one important characteristic; namely, that the child performs both kinds of action *while detached from the originally engaging object.* This detachment (Miller & Eller-Miller, 1989, p. 19) provides the child with the opportunity to become aware that the compensatory actions stem from his/her own body. Becoming aware of this, the child is able to change the action from an involuntary act triggered by the interrupted system to one that the child can deliberately direct toward any of an array of objects or events. This happens during the compensatory phase because, no longer merged with the previously engaging object or event, the child's own compensatory movements

constitute the most salient and thus engaging source of stimulation. Consequently, the infant performing sucking movements in the absence of the nipple has opportunity to vividly experience mouth movements as separate from but related to and directed toward ingesting the nipple—an achievement that probably makes it easier for the infant to access the nipple. In the example cited earlier of the 15-month-old child who became very distressed when her bracelet was taken (system interrupted)—crying, pointing at the desired bracelet and even trying to say the word—these varied compensatory actions quickly became part of a repertoire of behavior which could be *deliberately* enacted by her whenever there was a threat to things she held dear.

The Application of System Concepts to Resolve Object and Transition Problems

To help the children resolve such problems we developed a multi-system strategy that involved establishing a group of 3 or 4 systems, then working the children back and forth between first two, then three or four, interrupting them and then returning the children to the interrupted systems (Miller and Eller-Miller, 1989; 2000).

For example, once Damon, a 4.5 year-old child with autism, became comfortable with the Elevated Square (Figure 6), we address this issue by setting up spheres on each of the four corners of the square. A sphere is any activity that we introduce repetitively with the expectation that the child will "take it over" and transform it into an internalized system. Therefore, a multisphere set up is one where the child learns to cope with two, three or four different spheres.

The rationale for the multisphere is that a child like Damon perseverates because a) he lacks the self-object polarity needed to detach himself from the action-object system and b) because he has no clear sense of that system's continued existence once it is left (the "out of sight out of mind" phenomenon).

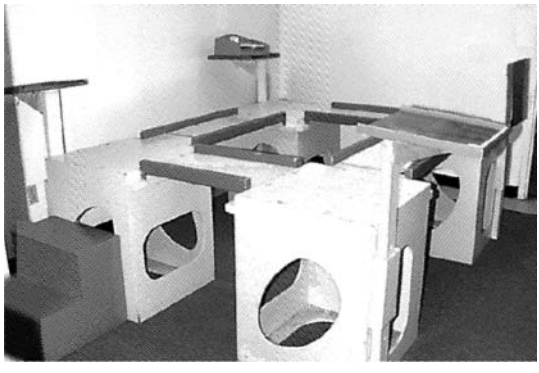


Figure 6. Elevated Square with adjustable stations.

Based on this rationale, the procedures were designed to teach Damon that he can detach from a compelling system and *still* return to it. The assumption is that by demonstrating this to him, that his impulse to perseverate will be attenuated. We do this by first engaging him in a particular action-object system on one corner of the Elevated Square and then interrupting it by leading him to a second, then a third, and, finally, a fourth system and repeating the process as follows.

After Damon becomes engaged with A—the first sphere (for example, pouring water over a water wheel)—we interrupt this sphere at the point of maximal tension (the point at which the child most needs to continue the activity). When this is done, Damon experiences—in Lewin's (1935) terms—a tension state related to the compensatory need to continue with that system. In spite of the child's clear need to continue with that activity he is led to an entirely different action-object sphere (sending marbles down a zigzag ramp) with which he becomes engaged. Because the first system has been interrupted and he has not had a chance to continue with it, that system continues to remain "alive" for him even while he becomes engaged by the second sphere. (This new sense of relation shows itself in glances at the sphere he has left just as he becomes engaged with the second sphere). It is this duality of experience that begins to make it possible for the child to relate and soon easily shift from one system to another. After a number of cycles involving the first two systems (A + B), then a third (A + B + C, putting cups on hooks) and four (A + B + C + D cutting clay) systems, Damon begins to demonstrate—by glancing at the different systems—a sense of how one system follows another. After a few sessions, Damon is no longer distressed when one system is interrupted because he knows that he will soon return to it.

But merely being able to shift clockwise from A to B to C to D systems—although important—is not sufficient to teach Damon how to cope flexibly with his surroundings. At this point we begin to vary his trips to the different systems at the four stations. In other words, after engaging with A, Damon clearly expects to go to B. Instead, Damon—clearly unhappy—is led past B to station C. This process is continued over a number of sessions until Damon can tolerate (and even enjoy) shifts from one station to another in all possible combinations—ACBD, DBAC and so on.

Once Damon can cope with shifting in all possible combinations of systems on the Elevated Square, these systems are shifted to the ground. Here, without the support of the Elevated Square, Damon generalizes his new ability by readily accepting shifts to the different systems on the ground. After Damon masters this new arrangement, he is placed on a stool so that he can survey all four systems. He is then asked to choose one to go to. When he can express a preference for one system over another by pointing, sign or word, we have evidence of the emergence of the ability to choose; an *executive capacity* that permits him to examine different aspects of his environment without being captured by any one aspect. This new executive functioning—coupled with the application of the extension principle—presages entrance to the symbolic-sign stage.

The Extension Principle as a Means of Increasing the Child's Scope

The inclusion principle accounts for one way in which the child's systems expand; a way characterized by the child inadvertently including new aspects as part of a particular system because, while engaged, the child lacks the means of discriminating between primary (figural) and secondary (background) sources of stimulation. The extension principle, however, refers to a way that children extend systems through their own activity:

> Whenever one system with which the child is engaged acts upon a new property of an object or event... that property becomes an expanded part of the original system. The (child) then maintains the integrity of the newly expanded system when it is interrupted just as if it were the original system. (Miller & Eller-Miller, 1989, p. 156)

Piaget observed that his son—while holding an object and waving his arms—inadvertently made a scratching sound as the object scraped the wicker bassinet cover. Subsequently the infant *sought to repeat the action that led to that new sound.* In our terms, the infant had extended the original hand-waving-object system to include the scratching sound because it had acted upon the wicker cover.

A similar application of the principle of extension can help the child with autism establish a bond with a parent when there was none previously. However, where the typical infant cited achieves system extension through his own spontaneous activity, for children with autism, the extension of systems must be set-up by the therapist or teacher. In this instance, system extension was achieved by extending the 3-year-old autistic child's crayon-scribbling system so that it included the mother.

The Procedure

The child is first heavily involved in a crayon-scribbling system (or other system involving the use of an object). The therapist then "steals" the crayon (or other object with which the child is engaged) and gives it to mother. The child—urgently needing to continue crayon scribbling—follows the crayon to the other side of the Elevated Square where mother is standing and holding the crayon in front of her face. As the child reaches for the crayon, mother's face is background. As the child takes the crayon he looks directly at mother's face (now foreground) and, after a number of repetitions, begins to include her as part of his crayon-scribbling system. This procedure is repeated with a variety of objects with which the child has formed systems.

This extension strategy works because the child needs the crayon so that he can continue his scribbling system. His going to mother for this needed object begins to make her relevant for him since she is fused with the object he needs. Finally, the perceptual shift from crayon to mother's face which is suddenly revealed and in focus—as the child takes the crayon, puts a face on this person who has things

he needs to complete his systems. In other words, mother, initially irrelevant to the child's crayon-scribbling system, becomes relevant because she has become an integral and identifiable part of that system.

The extension principle is also used in this way to help children make transitions from their knowledge of three dimensional objects to two dimensional pictures of these objects. This is done by fastening a part of the object on one side of a card, e.g., half of a cup, and a precise two dimensional replica of that object on the other side, so that as the card is flipped from object to picture side, the properties of the object "act upon" the picture and transfer object meaning to it. Indication that the transfer has succeeded is apparent when children attempt to pick up the cup in the picture as they would the actual cup. Here, they behave in much the same manner as an aphasic man that could only recognize a picture of food when he sought to pick it up and bring it to his mouth. Other examples of the extension principle are evident in the transformation of object meanings by a pair of developmentally delayed and isolated 5-year old twins studied by Luria and Yudovitch (1959, pp. 78–79).

In one of their experiments the experimenter took a small metal spoon, performed chopping movements with it and asked the children what it was. They answered that it was "an ax."; when the experimenter took a knife and swept the floor with it the children called it "brush." However, when the experimenter gave the children the knife without acting upon it and said it was "brush," they started sharpening the pencil with the knife. In this way they indicated that the word's fusion with dynamic actions that *acted upon* the object and not the word-object relation per se, dictated the extension of the word's meaning so that it transformed the significance of a familiar object.

In similar fashion, the extension principle accounts for the manner in which small children invest meaning in the conventional forms of spoken words when those words are paired with natural *symbol*s (natural *signs* in our formulation), for example:

> The child builds a combinatory name composed of the idiomatic plus the conventional word: wau wau-dog; bah-sheep; muh muh-cow; shu shu-train, etc. Later, the child begins increasingly to omit the first part, thus finally employing solely the conventional name (Werner and Kaplan, 1963, p. 108)

Just as the twins studied by Luria and Yudovitch transformed the significance of objects by acting on them, so small children use the rhythmic and uniquely patterned quality of the natural sign to *act upo*n the conventional word in a way that enables the child to *naturalize* and thus possess the word as a meaningful entity: The combination of naturalizing conventional words via the extension principle and the investing of meaning in words via the inclusion principle, contributes strongly to the symbolic-sign stage characterized both by the development of executive function and naming.

Symbolic-Sign Stage

This stage develops at approximately 18 months for typical children, but is either never reached or reached later by children on the autism spectrum. The term *symbolic-sign* captures the duality of experience that characterizes this stage. On the one hand, the child has achieved the ability to symbolize the body as a body/self permitting the exercise of choice and other examples of executive function, but on the other hand, that body/self is still somewhat captured by sign aspects of the child's surroundings. Similarly, the child achieves the symbolic insight that "each thing has its name" (Stern & Stern, 1928) and is now able to package reality through names. And yet, the sign aspect of these names is apparent in the child's requirement that the names continue to remain fused with their objects. In short, the symbolic-sign stage indicates that while the child has made an important step toward liberating the body from the domination of the sign or signal aspects of the environment, this liberation is far from complete.

Up to now, the sign stage child has only a vague sense of identity. The use of gestures and words are fused with his/ her own body actions. For example, among children with autism when taught to use the sign *get up* addressed to another, the child gets up; when using the sign for sit down to get another to sit down, the child sits down. There is no clear sense that the signs are addressed to another. The child may sometimes respond to his/her name when called by one person but not when called by another. Words for *mother* (Werner and Kaplan, 1963) are fused with the terms for all the things she does. With the onset of the symbolic-sign stage, this changes.

Symbolic-Sign Stage Changes in the Body/Self

With this stage, the child is able to symbolize or represent the body. The child can now designate and experience the body not only as a diffuse source of intention but as a coherent entity with arms, legs, hands, feet, a certain sex, and a particular name. However, because the child has been able to symbolize the body into a coherent body/self, can direct his or her behavior and make choices, does not mean that the child is now free to direct that body in space in a fully liberated fashion. For example,

> The Scupins report of their three-year-old boy: "While visiting the bear-cages in the Zoological Gardens we went up one flight of stairs leading to the place and left by another. Today, when we approached the same place by the stairs by which we had left the day before, the child held back, saying angrily: "These are the wrong steps: these are the going-down steps . . . the others are the going-up steps'.'" (Werner, 1948, p. 173)

A two-year-old child returning from a long trip orients himself in his home only after he has entered his own room. This room is the focus of all his movements

within the confines of his home. In other words, primitive space-of-action retains the property of a temporal succession, that is, irreversibility. In both examples, the rationale for placing these children at the symbolic-sign stage is clear. The children demonstrate their ability to symbolize themselves as discrete entities and yet they are still captured to some extent by the signal properties of the environment in a way that indicates they are in a transitional state between the sign and symbol stages of functioning.

Symbolic-Sign Stage: The Discovery of Naming

Just as the child integrated various parts of the body to achieve a body/self capable of executive function, so the child integrates the various properties of external objects into the sound forms of words. In contrast to action words that relate to a single vector—*push, walk, blow,* and so forth—words that relate to objects are driven by various salient properties of the objects or events and may shift from one property to another within the same or different objects. Before children learn to integrate these properties into a single named object, their terms are quite global and holophrastic.

In figure-ground terms, what occurs with the naming discovery is a shift from engagement with a salient property of the object as figural to the object itself as figural. Werner cited Shinn to show how engagement with a salient property of the object leads to erroneous generalization:

> Miss Shinn speaks of her nephew, a child six months old, who was given a round rattle instead of the customary square-edged one. The child tried in vain to find and bite the "corner" of the round rattle. (Werner, 1948, p. 65)

As long as a single, salient property or quality, such as the corner of a rattle is the basis for generalization—and not the rattle with both its form and sound properties—there is error. However, with naming, the object is known in its entirety and therefore provides an accurate template for generalization. In other words, with the progressive storing of salient properties—for example, when the term "bird" begins to signify a quick-moving, chirping entity that flaps or pecks, perches quietly on a branch, digs for worms, or may come close and eat from one's hand, it provides a standard for the word "bird" to refer to all bird-like creatures. When a number of spoken words incorporate object properties in this way, the child has basis for the important generalization that all things have their names (Stern and Stern, 1928). Once names of things are achieved, the name-object relation becomes more specific and takes on new cognitive and affective meaning.

At first glance, children seem to achieve with the discovery of names a full grasp of symbols—terms completely detached from their respective referents. Certainly, the new symbolic capacity is evident in the ability to designate and represent objects with certain utterances (names). They also learn that if they point to an object, request its name, and receive an answer designating it, that object exists as a

separate entity in their world—and can be "magically" invoked by merely uttering its name. The name as an object surrogate enables the child to "carry" the object meaning in the absence of the object. This provides a framework for children to convey the meaning of words to themselves and others in the presence or absence of these objects. Given the great utility of naming, it is not surprising that dramatic increases in spoken language vocabulary regularly occur, following its discovery, during the 2nd and 3rd years of life (McCarthy, 1954; Nelson, 1973; Stern, 1914; Stern & Stern, 1928).

However, opposing the impression that full symbolic capacity has been achieved is the finding that when small children first name objects, these names are not arbitrary symbols assigned to particular objects but—as Buhler pointed out—*required* responses to the problem that each new object poses for the child. This sign or signal aspect is evident in the child's continued requirement (Piaget, 1929; Vygotsky, 1962) that only these names—and not others—may be used to designate particular objects or events. In present terms, the newly naming child, engaged by an unnamed object, experiences it as an interrupted system that requires completion through the act of naming, thus substituting the compulsive demand for a name for the prior compulsion to act toward the object. The feeling of incompleteness induced by the unnamed object explains the urgency of the child's demand for its name and reveals the name's sign heritage. For this reason the term *symbolic-sign* characterizes naming.

It is important to note that the progression which flows so naturally among typical children as they progress from sign to symbolic-sign stages, may either not occur—or may occur much later and only after intensive work designed to nurture the integrative functioning needed to make this advance. Just as we found it necessary to teach Damon that he could move from one system to another and, finally, make choices as to which system he wished to engage to help establish the body/self—object polarity necessary for executive functioning, so do we find it necessary to teach the child the varied aspects of familiar objects in a way that parallels what typical children do spontaneously.

A strategy to help children with autism achieve naming is carried out in which the child collects (with assistance) the varied properties of an object with the form of the conventional word that relates to that object. This "collection" process—which parallels the process which we believe occurs in typical development—begins as the child hears a particular word—"cup," "ball,"—while using the object in a variety of cup- or ball-related systems. In this way the words begin to refer not only to the most perceptually salient property of an object but to its other properties as well. For example, the term "cup" refers to a certain object that can be poured into, picked up, and drunk from, and that maintains its identity as a cup even when not in use on a shelf. Then—as with typical children—when a stable relationship develops between a number of such utterances and their objects, the child has a basis for the previously described discovery that "each thing has its name."

Names in the Communicative Process

Before names can contribute to reciprocal expressive language (communication) the child must first learn to use them as part of a transaction with another. As Werner and Kaplan (1963) point out, names must transform into words before they can become parts of sentences that include people within their object systems. This is because communication requires the ability to relate to another around a third entity, such as an object, event or person that becomes the "conversation piece." Often, we see children on the spectrum able to relate to their parents or to objects but not to both at the same time. A second important precursor of communication is the child's understanding that his or her actions are influential. In other words, that he/she can cause things to happen first with hand or body action, then with tools that extend the reach of hands, then with gestures that simulate actions, and finally by spoken words.

In our practice—all the action systems developed on the Elevated Square and on the ground provide a basis for eliciting expressive signs and words from children on the spectrum via interruption. However, before the action systems can be tapped in this way it is desirable to expand all the systems so that they are not limited to one context. To do this we make certain that the autistic child performs an activity with different people, in different locations, with different objects, presented in different positions.

The Symbol Stage

If naming—the discovery of symbolic-signs—represents children's first major insight into words and leads to the gradual liberation of names and actions from their objects, then the ability to use symbols as arbitrary forms represents a second major insight into the nature of words. This latter achievement is referred to as the *fiat* insight (Miller and Eller-Miller, 1989, p. 147) because it enables the child, now fully aware of the distinct separation between words and their referents, to achieve reference, not through a sense of *requiredness* between word and object, but merely by the speaker's inner intent that a particular word form shall henceforth be represented by any of a variety of meanings. With this new understanding children can accept the notion that a table can be called *by* any of a variety of other terms simply by deciding to do so. As we will show, this capacity is critical for the development of reading and writing.

While the progression to symbol stage functioning—and reading and writing—occurs with relative ease for most typical children, this is not the case for children on the autism spectrum as well as those with other developmental issues including retardation. Since the achievement of reading and writing is one important indication of symbol stage functioning, it is desirable to indicate the manner in which the principle of extension contributes to this ability for developmentally challenged children.

Our view is that the transition to reading and writing comes about through name-guided extensions of meanings to other forms. An elaborate illustration of the extension principle was evident in the behavior of our son, David (aged 21 months):

> Sighting the sudden movement of a bird perched in the fork of a tree, David pointed at it while exclaiming, "Bird!...Bird!" During the course of these exclamations, the bird abruptly disappeared within the tree fork. Still pointing and peering at the tree fork, David continued to say "bird" but with a questioning intonation as if asking where the bird had gone. On subsequent visits to the tree he would point at the tree form and exclaim "Bird!" possibly anticipating that his utterance would induce the bird's reappearance on the branch. (Miller & Eller-Miller, 1989, p. 191)

Apparently, under certain conditions, a name may, independent of the child's volition, be invested in a form totally disparate from the object toward which it was originally directed. In the example given, the shift seemed to depend (a) on the system involving the name "bird," the pointing activity, and the engaging bird poised in the tree fork; (b) on the sudden disappearance (interrupted system) of the bird; and (c) on the child's compensatory impulse to maintain the system by imposing bird meaning on the site where the bird had last been seen. The combination of all these circumstances resulted in the tree fork, previously a ground for the figural bird, becoming, on the bird's sudden departure, part of the bird system because the bird had acted upon the tree fork by having been there. This extension principle has been applied in the research described below as a means of investing the meaning of spoken words in the arbitrary forms of printed words. The theory guiding this application is described in the following section.

COGNITIVE-DEVELOPMENTAL SYSTEMS THEORY APPLIED TO READING AND WRITING

Reading and writing entail a symbolic process that depends for success on the ability of children to expand their systems of spoken words to include graphic forms. Once children have extended certain meanings to these graphic forms (printed words), they can later derive these meanings from them. As Huey, 1908/1968) pointed out, like spoken language, reading and writing follow a developmental progression in which the graphic forms used to convey meaning become increasingly remote from their objects. Just as humans progressed from an ability to find meaning in pictures to more arbitrary ideograms and then to phonetically organized written forms, so too, the developing child first "reads" and "writes" pictures and then finds meaning in more arbitrary forms (trademarks, insignia, printed words) before being able to cope with phonetic reading and writing.

This progression is possible because each earlier developmental stage contributes to the formation of the next more advanced stage. Just as the sign stage contributes to the formation of naming (symbolic-sign stage), so does the symbolic-sign

stage through naming contribute to the formation of reading and writing and the development of symbol stage functioning. In achieving this, two factors are in play: One, the cognitive demands placed on the child by different kinds of graphic forms (pictures, printed words, letters); and two, the symbolizing capacity available to a particular child. Only when the demands posed by different kinds of graphic symbols are consistent with the symbolizing capacity of a particular child, will the child be able to read and write with those forms.

This view—coupled with Werner's work on physiognomic perception (see Cirillo, this volume; Wapner, this volume) guided our first experiments directed toward helping retarded and developmentally disordered children find meaning in printed words, Many children—both retarded and on the autism spectrum—while able to speak in two- to three-word sentences are often stymied when they first confront printed words and are asked by teachers and parents to attribute specific object meanings e.g., "cat" to the printed word *cat*. They can find meaning in pictures but have no basis for doing so with printed words which bear no resemblance to their objects. Contributing to their problem is the fact that the use of spoken words by these children is still fused with their objects. Consequently, when the teacher says that a particular printed word form is "cat"—and they are unable to find anything resembling that animal in the word—they tend to reject the word. Assisting these children with the transition to printed words requires another set of strategies.

Inadvertent Perceptual Extension of Meaning from Name to Printed Word

Werner's (1948, pp. 67–86; Werner & Kaplan, 1963, pp. 227–232) focus on the preeminence of the physiognomic process in young children has led to many empirical demonstrations. In one study they showed how children readily altered the forms of printed words to capture the emotional significance of the word. For example, the term ***angstlisch*** (scared) was written in a narrow, cramped manner in contrast with the word ***frohlich*** (glad) presented in a rounded, swinging, broadly written manner.

Because physiognomic presentations of words might be more readily apprehended by children than their conventional forms, we introduced such words to children who had been unable to learn to read. However, because the children needed to acquire the conventional forms of the words, we used the physiognomized (or accentuated) version of the word as a transition to its conventional form. To provide this transition, we attempted to create the perceptual illusion that the accentuated form of the word was "acting on" or merging with the conventional form in much the same manner that our son, David, transferred bird meaning to the tree fork.

In two experiments—using this extension by illusion strategy—(Miller & Miller, 1968) we first used flash cards and then a stroboscopic projector. In each

instance we sought to extend object or motion properties to the printed word by carefully relating and sequencing object or event properties with word contours. Then, when the accentuated form of the word was suddenly replaced by the conventional word, it provided a perceptual transfer of meaning from accentuated to conventional forms of the word as indicated in Figures 7 and 8.

In the first experiment, this was accomplished by having the accentuated form of the word on one side of a flash card that could be flipped to the other side where the word could be seen in its conventional form. Because the word on one side was carefully lined up with the word on the other side, a rapid flip of the card provided the illusion that the accentuated form had transferred its properties and thus its meaning to the conventional form of the word.

In the second experiment with stroboscopic slide projectors (Figure 8), the word was flashed in its accentuated form while in the other it was flashed in its conventional form. When both projectors were focused at the same place, flashed at 2.7 times per second there was the illusion of motion. Then the word *walk* appeared to walk, the word *jump* to jump, etc. In both studies the task for the children was to successfully identify each word presented and, later, to identify that word in its conventional form when it was presented with other words. Half the words were presented in the accentuated + conventional format while the other half were presented only in the conventional format. Results from both studies, clearly showed that when the children were exposed to the accentuated condition, they required significantly fewer trials to correctly identify the words. Further, they could then

Figure 7. (Tables of accentuated and conventional words) Ritual p. 193/194.

Figure 8. (Tables of accentuated and conventional words) Ritual p. 193/194.

discriminate the words they had learned from other words just as readily as those words which had been taught in the conventional condition.

Critics of this first study argued that the positive results were a function—not of the blending of accentuated + conventional words, but because there were perceptual properties in the accentuated condition but not in the conventional condition. Another study (Miller and Miller, 1971) was conducted to clarify this issue with retarded children as well as to study its effect on typical children ages 3–4 and 5–6 years of age.

Results of this study showed that retarded children unable to read did significantly better with the accentuated words that merged into their conventional forms than with the words in the "look say" or separated condition. This was also the case for typical children in the 3–4 year old age group. Children in the 5–6 year old group, however, did just as well with the accentuated as they did with the separated condition. The implication here is that the 5–6 year olds were entering the symbol stage where they had begun to grasp the notion of arbitrary (non iconic) symbolic forms and, consequently, had little difficulty establishing reference between word and its object.

The theoretical question this posed was as follows: If 5 and 6 year old children have reached the symbol stage in their development when they no longer require accentuation to help them establish reference, does that mean that this capacity generalizes to other domains such as the symbolic relation between letters and sounds, or is the new symbolic function limited to the printed word domain?

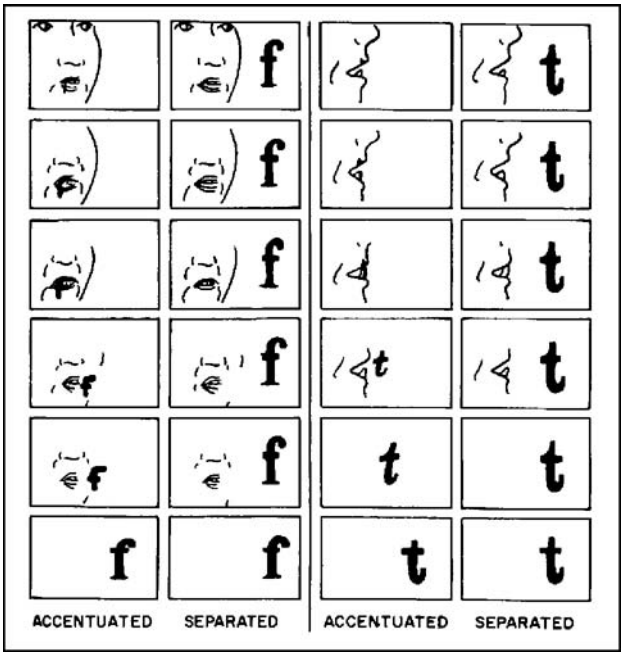


Figure 9. Mouth-letter accentuation p. 207 ritual to repertoire.

To examine this question, we created with the help of animation (Miller, 1968), accentuated sequences which provided a transition from mouth movements to letters (Figure 9) and contrasted that with a conventional condition in which the mouth movements and the letters were quite separate.

The results of this study showed that 5 and 6 year olds did significantly better with the accentuated mouth-letter condition than they did with the separated mouth-letter relation. These results supported the view that the symbolic function in one domain does not automatically generalize to unfamiliar domains. Apparently, the symbolic function must be established for each new domain until it is generalized. It also suggested that children who had begun to achieve symbolic function in one area (word-object relations) could still benefit from accentuation procedures when dealing with the unfamiliar letter-sound relation.

Subsequently, we integrated these findings within a reading program—Symbol Accentuation. In this program, progress toward symbolic functioning was assisted by beginning the first few lessons with pictures of animals or objects (bird, cup, etc.) that morphed into their conventional word forms in the manner described. However, in later lessons, efforts were made to "wean" the children from a dependence on "morphing" by having a temporal relation between word and

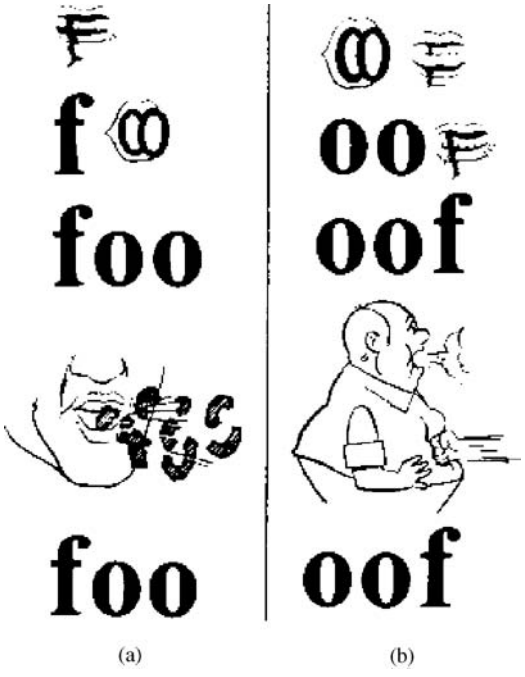


Figure 10. Foo and oof on page 459 ritual.

object without the physical merging. Through this process the children gradually formed the notion that the arbitrary forms of printed words did not have to resemble their objects in order to convey object meanings. When the children could do this, we felt they were ready for phonics.

Analyzing the phonics process we noted that it required a shift from the word as picture-like form to the word as a source of mouth-letter-sounds that when uttered in the proper sequence would produce a familiar spoken word.

To make certain that the meaning wasn't lost during the phonics process, this was set up in the following fashion as an animated series on a CD ROM (Figure 10). With this format the child was guided step by step into sounding out and constructing a word form. The merging of mouth movements with the letter formed induced many of the children to automatically simulate the mouth postures as they unfolded on the computer screen. Then, once the word was formed, the relevant object/event sequence was flashed on the screen to make certain that the child understood that the word created had a particular significance. Dramatic events such as those indicated in Figure 10—with strong visceral content—were selected because our experience indicated that such meanings were better maintained then more conventional terms.

Contrasting the words *foo* and *oof* in separate animated presentations helped the children understand that the placement of the letters in a certain order radically changed the meaning of the word. Ultimately, of course, the children had to learn that they could assign the meaning of the words they had decoded by sounding them out to the printed word form so that it was no longer necessary to keep sounding out these words when they were later encountered.

Simple words like these could readily be elaborated, for example, by placing the letter **r** in front of **oof** to make roof or the letter **d** after **foo** to make the word food. In this way children learned that changing the letter-sound forms of the word dramatically altered its meaning. Subsequently, similar procedures were used to develop words with all the short vowels. Retarded, learning disabled, deaf as well as children on the autism spectrum were able to learn to read and write with the help of these strategies (Miller & Eller-Miller, 1989, p. 428–469).

Beyond Reading and Writing at the Symbol Stage

While the achievement of reading and writing describes one important aspect of symbol stage functioning, it is useful to follow the course of a child on the autism spectrum as he achieves first spoken and written language as well as social capacity. In doing so, it becomes apparent that the child's aberrant functioning leaves its mark on this process in a way that does not occur with typical children's advance to this stage. In the following, there is a discussion of Jack's progression from a profoundly disordered child of the closed system type—captured by the signal properties of his surroundings—to a child who largely but not completely liberated himself to progress to more advanced stages. Below, 3 year 5 month old Jack is the subject of an interview I conducted with his parents just before he began to understand the relation between words and their objects and move into the symbolic-sign stage. Here, Mrs. H, Jack's mother, describes Jack after 6 months at the Center. I have just asked mother how she carried over the work of the Center to home. She answers by describing what she did and how he responded.

Jack's Compulsion to Categorize Pictures and Things

> **AM:** How about the work at home? How would you decide what to do.
> **Mrs. H** (Jack's mother): We . . . carried over to home (from LCDC) the idea of him to use pictures to represent things. One way we did this was to put pictures on the walls of his room as you had done at LCDC instead of just in his hand. It worked for a few weeks and then he would take them down and make piles of them. I bought a bunch of animal calendars and would have a room full of frogs one day; the next day a room full of bears. The first time it lasted 3 or 4 days, and then he took them down and put them in piles. Piles that you couldn't disturb. And then I might put up a bear calendar around the room. This might last 2 days, and he would then take them down and put them in another pile.

He also began to make piles of other things at home. And that was new after K (his therapist) started with him. He would take everything out of the food closet after once seeing me take a can out of that closet. He would put everything from the food closet on the counter and protect that uneven pile of cans and so forth with his body. It became his and you couldn't touch it. Three or 4 hours later, when he was into something else, I could start moving things back in. He did the same thing with the refrigerator—taking everything out—especially the jars. At first he would mix up what belonged in the food closet with what belonged in the refrigerator. But within a month and a half he was able to take everything out from both food closet and refrigerator and put them back again in exactly the right spot: Refrigerator foods would go back in the refrigerator; canned foods would go back in the closet. He still has some of that quality. Even now, when he doesn't want something to change—like he's afraid I'm going to change something on the TV—he will literally push me away from it.

AM: So the connection between the way certain things go together—certain pictures with certain objects—that K started working on with Jack at the Center continued at home...

Mrs. H: Yes. And the clothes... He would take all my clothes out of the closet and try to get me to wear everything at once—whether or not they fit. Then I discovered that I didn't have to put them on but just had to touch my body with the clothes... If I took a bath he would come after me with the sweater he needed me to put on. I'd say "No!" and he would go through a half-hour tantrum, screaming... Then he would go to his sister's clothes and do the same thing... but after a short time he wouldn't let me put his sister's clothes against my body; they had to be placed in contact with his sister's body. And this was very frightening to her. I had to tell her it was a little game and not to worry.

Mr. H: (father) I remember the day he dragged my shirt downstairs.

Mrs. H: He dragged it down in the middle of the night... his work shirt.

Mr. H: He knew... He brought down my shirt for me. He needed to connect each person's clothes with them just like he had to connect each picture with the right object.

Mrs. H: And this went on for a couple of months and now he no longer does it. Now, if he wants to go outside and he thinks I'm ready he will get me my jacket and his jacket...

Jack, apparently having reached the awareness that there are things out there needed to learn how one thing differed from another before he could name these things. His urgent need to categorize which begins this vignette is consistent with his closed system disorder but leads ultimately to the notion of naming.

Changes in Jack's hearing

Mrs. H: Another thing that happens to him now that didn't happen before he started the Center is around his hearing. Before he started here, if I snapped my fingers in back of his head, he would turn toward the sound with a very unhappy look on his face. But if I were to bang my fist against a sheet-metal

slide he probably wouldn't even blink his eyes. After he started at LCDC—as he became more aware of sounds—his hands would go up to his ears. Previous to coming here they would not go up to his ears except when he was screeching in a tantrum. It may be that sounds are more disturbing because he is opening up more and more. Before he came here—at age 2—we felt that he was withdrawing into himself more and more.

Mr. H: But as he started to open up, it seemed to me at any rate that the more he opened up, the more problems he had with sound sensitivity.

AM: As if he suddenly started to notice a whole universe of sounds.

Mr H: Yes but K told me to speak to him softly and to try to keep the object close to him . . . Yesterday, . . . I, just out of curiosity, loudly yelled, "Jack1" And he turned around. Previously he would never respond to loud sounds. So I don't have to whisper his name anymore.

Jack's First Spoken Word

Mrs. H: Another thing K did was to give special sounds that went with each animal: this is a cow it goes "moo"—giving separate sounds to help identify each animal.

Mr. H: We carried that over at home . . . The first word that had significance for him was *bear* so we got him a pull toy with a bear in it and he pulled it at home just as he had at the Center. He recognized it immediately and began to pull it around the room. It was his bear on wheels. But he still wouldn't pull other similar toys around the house.

AM Has his interest in objects continued?

Mrs. H: Yes, but it hasn't increased. He has many more activities now. For example, now he likes to go upstairs with his picture book by himself. And he likes his little quiet time so he sits down and reads his picture book. He still has that (interest in pictures) . . . But after a few weeks he's used them up and he puts them under the rug. He just doesn't want to see them anymore and I have to get him a new batch.

Mr. H: Now, whenever you bring something new in the house he gets very, very excited. When we buy something for Ann and for him, he now not only has to look at his own new thing, he has to look at her object too.

AM: What about naming things?

Mrs. H: His vocabulary keeps increasing. With each week there may be 2 or 3 new words. It's not clear yet how consistent these words are. The day before yesterday somebody brought a cake and I put two plates on the table and I said, "Here, cake!" and he walked right over to the table and said "Cake!" And that's the first time he said "cake." Our experience is that the words are not yet stable. One day he will have the word, and the next day he may not. But from a child who last September (at about 2 years 8 months) had not one word, he now has 10 or 15 words and all the letters of the alphabet. He not only names the letters of the alphabet, he can recognize them by shape on the page . . . right through the whole alphabet.

Jack's New Executive Capacity

He can now also make a choice between two objects... Before we started at LCDC if we presented him with a choice, he immediately started to tantrum. Now, given a choice between milk and juice, he will push away the one he doesn't want and take the other. The other day when I offered him toast, he looked at it and then walked over to the closet, got the cereal box, and brought it to the table.

Playing with Word-Object Relations

About six months after this interview, there is a videotaped sequence of Jack—shown in the documentary "A Small Awakening"—where he giggles as he playfully calls a model of a seagull by different names, saying, "It's not a seagull. It's a sparrow." Then, a bit later, still clearly enjoying himself, "That's not a sparrow. It's an owl."

It is interesting to note that while Jack is able to playfully introduce different kinds of birds, he never goes beyond the bird category. One might argue that if he were truly liberated, he could call the seagull a hat—something quite detached from the bird category. The changes in Jack's relationship with people to be described below occurred at the same time the changes in his language were taking place. However, to keep the lines of development clear, I have kept the two areas separate.

Jack's Changing Social Contact

AM: Have you noticed any changes in his relationships with people?

Mr. H: At first he very much enjoyed being a spectator. I would chase my little girl around the house and he thought that was the greatest. But I could not get him to join in...

Mrs. H: In the past 2 days—where it's been very hot—I've taken him and his sister into the little wading pool in the backyard. And this is the first time he ever chased his sister around the backyard with the garden hose, trying to get her wet. He was doing to her the same thing she had done to him in the past. And he was enjoying himself. This was not to hurt her. This was actually the first time that he was the one who initiated the game. Also, he and his sister now hug a lot. She has taught him to hug. And he loves to hug her. Unfortunately, at the playground, he now goes to girls the same size as his sister and tries to hug them. And they don't know what is going on. But I look at it this way. He's a 3-year old boy. And he's certainly allowed to hug other children. And if the other children want to get freaked out, then it's their thing.

AM: Earlier, Mr. H, you commented that now you had a son. When did you begin to feel that way?

Mr. H: When he came here (LCDC) six months ago, I had no relationship with my son whatsoever. None. No matter what I tried to do, I just did not exist for him. If I went into the back room where he was playing with an object and I started playing with that object—nothing. He wouldn't even turn away and go to some other object. He wouldn't even give me that. He would just stand there until I went away and then he would continue his

play. It was like my presence was part of a dream for him. And if there was a block on the other side of my body that he needed, he would just step on me to get it as if I were stairs or something. I was nothing more than part of the sofa if I was sitting there. When I came home form work, if he was in the kitchen, there was never any response related to whether I had come or gone. I could've been hanging upside down. It wouldn't have made any difference. There was absolutely no contact whatsoever, no recognition, no anything.

Mrs. H: And there was no name for you either.

Mr. H: I really totally did not exist. And he would not allow me to snuggle up with him, give him a hug or pick him up... Only after we started at LCDC did things start to change. We learned how to get eye contact by using the object at eye level with him while saying "Here (offering the object) Jack!" but most progress started to happen when you suggested that I be physical with him, bounce him up and down, do "Rough and Tumble" with him. That was very important. We found that he loved that and that it broke down the barriers. And now he enjoys a very physical contact with his dad. He likes to hug his dad...

Mrs. H: To jump on and ride on your shoulders...

Mr. H: and I notice now a lot of times if I'm lying down, napping before I go to work, he will get up and snuggle next to me for a while. Now I feel—considering Jack's disability—that I have a very, very good relationship with him. I am very, very happy with it. There is no question in my mind that the "Rough and Tumble"—the physical contact—was the turning point... Within 3 or 4 days (it) changed his entire attitude toward me. He started coming over and wanting to play with me while before (laughs) I just wasn't there.

Jack Visits LCDC

About 10 years after the interview, mother brought Jack, now a sturdy-looking, fully literate 13 year old, who enjoys communicating on the internet, to visit the Center. When we met again, mother asked him if he remembered Dr. Miller. "Of course," Jack replied, "Dr. Miller with the white Sable, the black Taurus, yellow Volvo, etc. (naming all the cars I had during his 5 year stay at the Center)". Clearly, the cars I had driven were, for him, an indelible part of the Dr. Miller system. While Jack's intellect is quite unfettered, it is likely that he—like many who have emerged from autism—will continue to closely link people with their objects.

Our experience with hundreds of children on the autism spectrum, teaches us that no two children achieve symbol stage functioning in exactly the same way. For some, like Jack, pictures provide an important framework for moving forward, while for most, sign language paired with spoken words is the critical vehicle for the transition to functional language. All who achieve this stage, however, do so because they have grasped the efficacy of uttering names that both designate and help them get desired things and events. Like Jack, they extend the meaning of

names to pictures and to the forms of printed words and learn that the sound forms of words are not merely names "fixed" to certain objects or their pictures, but symbols separate from and representing these objects.

With this new understanding children like Jack learn to communicate and to read and write. However, this is possible only with careful transitions that make it possible to move from sign through symbolic-sign to the symbol stage.

Some Thoughts on the Relation between Stages

Cassirer (1970) argued that there is no apparent relation between signs and symbols... Our work suggest that there is and that the symbolic-sign stage mediates between the two. In a sense, the difference between us is based on different definition of signs. When Cassirer (1970) spoke of signs he is referring to the conditioned responses apparent with Pavlov's dogs. When we speak of the sign stage we refer to these signs as well as those which Werner and Kaplan refer to as "natural symbols". Cassirer also does not take into account the gradual loosening of the imperative bond between sign and signified apparent toward the latter end of the sign stage where a child has considerable latitude in the use of signs.

We agree with Cassirer as well as Werner and Kaplan that there is a gap between the most advanced signs and the earliest use of names. It is this gap that prevents many children on the autism spectrum from advancing beyond sign-stage functioning. We maintain, however, that the gap is not as large as previously thought. We find that there are mini insights that the children have on the way toward the symbolic-sign stage that presage the shift from sign to symbolic-sign stage functioning. For example, one girl on the autism specturm who learned the sign for *get up* and *sit down* seemed to suddenly grasp the power of her hand movements to influence others. She got very excited and began running to different people in her school to try out the power of her new signs by requiring that they *get up* and *sit down* as she made her signs.

In closing, I would like to express my profound admiration and appreciation to teacher and friend, Heinz Werner. Without his providing the developmental ground on which to stand, we would not have known how to even begin our work with children on the autism spectrum.

REFERENCES

Ainsworth, M. S., Blehar, M. D., Water, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the Strange Situation.* Hillsdale, NJ: Erlbaum.

Bauman, M. L. (1999). Autism: Clinical features and neurobilogical observations. In H. Tager-Flusberg (Ed.), *Neurodevelopmental disorders* (pp. 383–399). MIT Press, Cambridge, MA.

Bettelheim, B. (1950). *Love is not enough.: The treatment of emotionally disturbed children.* Glencoe Free Press: New York.

Blakeslee, S. (2002/11/19). A Boy, a Mother and a Rare Map of Autism's World: NY Times.
Cassirer, E. *An essay on man.* Toronto: Bantam Edition.
Goldstein, K. (1939). *The organism: A holistic approach to biology.* New York: American book.
Huey, E. B. (1908/1968). The psychology and pedagogy of reading. Cambridge, MA: MIT Press. (Original work published 1908).
Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child, 2,* 217–250.
Kanner, L. (1971). Follow-up study of 11 autistic children originally reported in 1943. *Journal of Autism and Childhood Schizophrenia, 1,* 119–145.
Keller, H. (1903). *The story of my life.* New York: Doubleday.
Konstantareas, M. M., Oxman, J., & Webster, C. D. (1977). Simultaneous communication with autistic and other severely dysfunctional nonverbal children. *Journal of Communication Disorders, 10,* 267–282.
Konstantareas, M. M. (1984). Sign language as a communication prosthesis with language-impaired children. *Journal of Autism and Developmental Disorders, 14,* 1, 115–131.
Lovaas, O. I. (1987). Behavioral treatment and normal education and intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology,* 55, 3–9.
Luria, A. R., & Yudovich, F. I. (1959). *Speech and development of mental processes in the child.* England: C. Nicholls. London: Staples Press.
Miller, A. (1959). *An experimental study of the effect of sensorimotor activity in the maintenance of the verbal meanings of action words.* Unpublished doctoral dissertation. Clark University.
Miller, A. (1963). Verbal satiation and the role of concurrent activity. *Journal of Abnormal Social Psychology, 3,* 206–212.
Miller, A. (1968). Symbol Accentuation: Outgrowth of theory and experiment. In *Proceedings of the First Internatinal Congress for the Scientific Study of Mental Deficiency,* Montpellier, France (pp. 776–772). Surrey, England: Michael Jackson.
Miller, A., & Miller, E. E. (1968). Symbol Accentuation: The Perceptual transfer of meaning from spoken to written words. *American Journal of Mental Deficiency, 73,* 200–208.
Miller, A., & Miller, E. E. (1971). Symbol Accentuation: Single-track functioning and early reading. *American Journal of Mental Deficiency, 76* (1), 110–117.
Miller, A., & Miller, E. E. (1973). Cognitive-developmental training with elevated boards and sign language. *Journal of Autism and childhood Schizophrenia, 3,* 65–85.
Miller, A. & Eller-Miller (1989). *From ritual to repertoire: A cognitive-developmental systems approach with behavior-disordered children.* New York: Wiley.
Miller, A. & Eller-Miller (2000). The Miller Method®: A cognitive-developmental systems approach for children with body organization, social, and communicative issues. pp. 489–517. In *Clinical Practice Guidelines: Redefining the Standards of Care for Infants, Children, and Families with Special Needs* (Eds. Greenspan & Wieder) Interdisciplinary Council on Developmental and Learning Disorders, Bethesda, MD.
Pavlov, I. P. (1927). *Conditional reflexes: An investigation of the psychological activity of the cerebral cortex.* Oxford: Oxford University Press.
Pavlov, I. P. (1928). *Lectures on conditioned reflexes* (W. H. Gantt, Trans.). New York: Liveright.
Pavlov, I. P. (1962). *Essays in psychology and psychiatry.* New York: the Citadel Press.
Piaget, J. (1954). The construction of rreality in the child. New York: Basic Books.
Shore, S. (2000). Beyond the wall: Personal experience with autism and Asperger Syndrome. Shawnee Mission, KS, Autism Asperger Publishing Company.
Sokolov, Y. N. (1963). Perception and the conditioned reflex. New York: Macmillan.
Spitz, R. A. (1945–1946). Hospitalism. In *Psychoanal. Stud. Child.* I. 53–74; II, 113–117. New York: International Universities Press.
Stern, C. and Stern, W. (1928). Die Kindeersprach. Eine psychologische und untersuchung (4th rev. ed.). Leipzig: Barth.)
Uexkull, J. von (1957). A stroll through the words of animals and men. In Schiller, C. H. (Ed.) *Instinctive behavior,* Part I. New York: International Universities Press.

Werner, H. (1948). *Comparative psychology of mental development*. Chicago: Follet.
Werner, H. (1937). Process and Achievement. A Basic Problem of Education and Deelopmental Psychology. *Harvard Educational. Review*, 7, 353–368.
Werner, H., & Kaplan, B. (1963). *Symbol formation: An organismic developmental approach to language and the expression of thought*. New York: Wiley.

GENERAL SYNTHESIS

RECURRING AGENDAS: INTEGRATION OF DEVELOPMENTAL SCIENCE

Jaan Valsiner

Heinz Werner left a seminal trace in the developmental psychology of the 20th century. He could be considered—together with James Mark Baldwin and Lev Vygotsky—to be one of the founders of the developmental science. As that scientific orientation is again on its upswing in the scene of contemporary psychology (Cairns, Elder & Costello, 1996), the present book contains a new analysis of a special kind—looking at Werner's developmental thinking within its social contexts. These contexts were crucial for the creator of ideas—Werner's development took place through the move from the Viennese ambience to that of Northern Germany, and further to North America.

As was charted out in the Introduction, today's developmental science attempts to accomplish something similar to the research program Werner tried to launch in mid-1950s, between Clark University and Worcester State Hospital (Werner & Phillips, 1955). Our context is different—yet the problems of creating a consistently developmental theoretical framework and making it work in empirical practice remain the same. Contemporary developmental science has something to learn from the retrospect on Heinz Werner's relating with his contexts.

INTELLECTUAL INTERDEPENDENCY

It needs to be emphasized that my reason for editing this book goes beyond the specific interest in Werner's legacy *per se*. The book continues to investigate

the complexities of intellectual interdependency in the development of ideas (cf. Valsiner, 1988; Valsiner & van der Veer, 2000; van der Veer & Valsiner, 1991). Ideas emerge and grow within social contexts—yet the ideas are created by persons who at times are only peripheral participants in the social processes within a given society. Ideas are formulated by persons—yet as a result of social embeddedness of the persons (Valsiner & van der Veer, 2000).

History of any science has a large potential for innovation of the science. Contrary to the widespread belief of many scientists—who dismiss their own history as something "past" and "useless"—re-analysis of histories of theoretical idea systems opens for contemporary science the door to creation of new concepts (Knorr Cetina, 1999; Löwy, 1992). Looking carefully at both the empirical research traditions led by Heinz Werner and the re-structuring of his theoretical ideas has implications for the future of our contemporary developmental science.

Werner's role in developmental science entailed the maintenance of basic ideas that *Naturphilosophie*, *Ganzheitspsychologie* and the "Würzburg tradition" of Oswald Külpe and Karl Bühler had set forth. In his consistent manner, Werner made careful efforts to translate these ideas into empirical work. In his heart Werner was an experimental psychologist operating within a grand developmental framework. He considered theoretical issues as crucial for making sense of empirical evidence—yet the clarity of empirical investigation entailed for him the same beauty as music or poetry did. Parallels with Jean Piaget are probably fitting here (Valsiner, 2001). Both Werner and Piaget are seen as "theorists"—while their heart was in experimental and naturalist's encounters with relevant reality. Such reality requires philosophical, meta-theoretical, and phenomenological insights by scientists to become methodologically productive (Branco & Valsiner, 1997). This was understood by scientists of the first half of the 20th century, but is not always clearly understood in our time. Since both Werner and Piaget addressed basic issues of development they necessarily contemplated about that reality in abstract terms. Theory and empirical investigations were two sides of the same basic epistemic activity for both of them—as well as for all other major developmental scientists (e.g., Lev Vygotsky, Arnold Gesell, and others).

WERNER AND US

Werner's social context was obviously different from ours. Psychology in the 1920s was still involved in substantive dialogues with philosophy and the natural sciences (see Ash, 1995). Since World War II these dialogues have become slowly replaced by social positioning of different "schools" in psychology vis-à-vis one another. "Cognitivists" are observed to fight "behaviorists", "vygotskians" are viewed as being at the throat of "piagetians", and so on. Such groups are formed in the politicized minds of social scientists—and are provably inadequate when any serious scientist's efforts to make sense of phenomena are

scrutinized.[1] At the same time, *de facto* boundaries are being built between psychology and philosophy, as well as between psychology and natural sciences. If psychology departments in the past had animal laboratories and got students perform experiments on species other than humans, then contemporary psychology departments increasingly replace animal laboratories with rooms filled with internet-linked computers.

Ideological and technological distancing of the researcher from the object of investigation leads to lack of appreciation of complexity of phenomena—or of theories. It is only our contemporary—philosophically *dis*-educated—state of psychology that lets us wonder about the vagueness of the generality of classic theories of the past. Theoretical sophistication is a problem only for well trained but not widely educated researchers who are capable only for carrying on the traditions of "normal science" (in a Kuhnian sense), rather than arriving in breakthroughs. In case of developmental science such breakthroughs are particularly needed, since the whole set of developmental phenomena—emergence of novelty—requires the use of abstract language. Werner's efforts to develop a systematic theory of development through the notion of differentiation was a step in the necessary direction.

Of course—like any other scientist—Werner did not solve all the problems he addressed. In fact his contributions are particularly valuable as they raise new questions. Neither was Werner's thinking always internally consistent. Nobody needs to expect it from any human being who—under different circumstances—operates at different levels of hierarchical self-organization. Development *a la* Werner—which needs to include Werner's own development—entails co-existence of various levels of organization.

A SCIENTIST AND HIS HISTORICAL CONTEXT: WERNER AND THE UNITED STATES

The present book has the aim of opening the door for further constructive inquiry into Werner's thought. Simultaneously we can see the life course of the scientist's ideas as he relocates between two continents. Heinz Werner's migration from Europe to America creates a unique opportunity for a study of the role the socio-historical contexts can play in the development of key ideas in a science. It has been documented (Cairns, 1998) how it is precisely the developmental orientation in science that has had its ups and downs in the history of U.S. society. At times—such as 1890s, 1920s, 1950s, and 1990s—these ideas have been in the center of attention of different communities of scholars. At other decades, however, the

[1] In actuality, Lev Vygotsky was very close to Jean Piaget—despite the social creation of the myth of incompatability between "vygotskians" and "piagetians" (van der Veer & Valsiner, 1991). The present book provides ample evidence that Werner was not a creator of a specific "wernerian" perspective (as opposed to other "schools"), but an integrator of various efforts to make sense of development.

developmental orientation has been delegated to the background of the dominance of non-developmental orientations. The latter begin to dominate at times of the social use of psychology's knowhow—usually for selection purposes (see Danziger, 1990, chapters 5 and 7). Thus, historical periods of different social demands on a science create different *Zeitgeists* for that science. But what happens when a scientist enters a particular foreign society at the time of one or another *Zeitgeist*?

The Carrier of Ideas and the Receiving Social Context

A migrant scholar arriving in a society where the meta-theoretical focus fluctuates between foregrounding and backgrounding his root ideas is faced with a substantial adaptation problem. This issue has been critical for every notion of developmental kind that has migrated from Europe to the social context of the United States since late 19th Century (see Dolby, 1977, on comparison of two sciences—psychology and physical chemistry—migrating to North America). Another observer of the North American psychological scene—at Werner's time—put it succinctly:

> In general, most American psychological activity proceeds 'as if' reality were fixed and stable rather than changing and developing (a state rather than a process), and as if it were discrete and additive rather than interconnected and patterned. This blindness to the dynamic and holistic aspects of reality is responsible for many of the weaknesses and failures of academic psychology. (Maslow, 1948, pp. 22–23)

Maslow's diagnosis of the problem with psychology in the United States of the 1940s remains very true sixty years later. It can be the social "block" against letting developmental science ideas flourish in North America (Cairns, 1998) so that such ideas are episodically getting a new start, develop to some extent, and then become extinct—until the next period of their re-birth comes.[2]

Werner's Arrival

When Werner arrived in the U.S.—at a time of severe economic difficulties for academics—the orientation in the local psychology towards processes of development was on the decline. This surprised Werner—who carried within him the life-long learning program of the study of development—ranging from art to ontogeny and psychopathology. Werner joined in—bringing to psychologists in North America the relevance of the Central European holistic traditions (Werner, 1937, 1938). He pointed to the limitations of the reduction of psychology to the investigation of products, and called for the primacy of the study of processes (in contrast to outcomes) as central for all psychology:

[2] Similar process can be seen in the history of acceptance and rejection of the topics of thinking or cognition—in the history of psychology in the U.S.

> Measuring development by means of achievements has proved to be a successful approach, and has provided valuable insight into the laws of mental growth. Nevertheless, this method of understanding must be supplemented by the analysis of mental processes which underlie the achievements themselves (Werner, 1937. p. 353)

The question he addressed was that of figure/ground dominance in the research practices. Without any doubt—"outcomes" (i.e. stable states of functioning) of the organism are visible, recordable, and analyzable "anchor points" for the description of organisms' development. Yet mere description of outcomes is in principle mute to their explanation. Werner—and the whole tradition of the Continental European personology (William Stern) and ecological psychology (Kurt Lewin), as well as that of developmental psychology (Lev Vygotsky, Karl Bühler, Jean Piaget) accepted the notion of primacy of the study of psychological processes over outcomes, and the centrality of single-case, systemic analysis of the phenomena. All this was in line with Werner's *Ganzheitpsychologie* roots—fortified by the Hamburg tradition (William Stern, Ernst Cassirer, and Jakob von Uexküll). Yet all of the basic ideas were already in the process of formation during his Vienna and München periods (see chapters 1 and 3 in this book).

Werner in Transition

Despite the uncertainties of no secure academic position, Werner's "middle years" in America—1933—1947—were intellectually very productive. The moves between Michigan, Harvard, Brooklyn College, and especially the research done at the Wake Country Training School, furthered his phenomenological base and brought a number of themes (such as rigidity/flexibility) into a greater theoretical focus than before. It is the work from this period that has led to continuous practical applications—outlined in detail in Arnold Miller's chapter above (chapter 19).

It also entailed a new form of socialization—into the use of statistical paraphernalia into Werner's empirical work. Early work coming out from the Wayne County Training school was free from the use of statistics—and followed the ethos of the process orientation Werner had proclaimed in 1937 (e.g. Werner & Strauss, 1939a, 1939b, 1940). A few years later, his studies conducted with handicapped children indicated slow integration of the reporting of p-values—first to compare different "mental age" groups of the children, but later to indicate the differences between groups of children compared (e.g., Werner, 1944, 1945a).

Werner's Adaptation

All psychology in America was being colonized by "empire of chance" in the 1940s and 1950s (Gigerenzer, et al, 1989). This it is not surprising that the empirical research program led by Werner continued at Clark to emulate this new fashion. Yet there were local differences. Most of the empirical papers on issues of sensory-tonic

theory entailed the use of statistical tools.[3] So did some of the dissertations carried out on the side of meaning construction and symbol formation (e.g., Baker, 1953; Kaplan, 1952, as well as most others). In contrast to the whole set of publications in the sensory-tonic field theory domain, in the final major work from Werner—*Symbol Formation* (Werner & Kaplan, 1963) the reader can encounter reliance upon statistical technicalities 4 times (reported p-values) in a 500-pp book!

While the data analysis techniques began to emulate the developing American norms for use of statistical technicalities, Werner's actual methods—experimental techniques of functional kinds—remained similar to those used in Hamburg. This is not surprising—for an experimentalist statistical techniques are at most peripheral tools—aids in inference making. If an experiment is clearly set and fits the questions asked, there should be no need for the use of statistics. The emerging results would speak for themselves (e.g., see Kaplan, 1952, for an example of use of statistical methods on phenomena that are clear-cut).

It seems that Werner's adaptation to the North American academia through the practice of study of handicapped children led to a dichotomy in his empirical research program—the methods he and his colleagues invented remained process-oriented, while the data derived through the methods became recorded as outcome measures and analyzed in ways appropriate to outcome measures. This dichotomy continued and became expanded during his years at Clark.

Werner and the Clark Tradition

Werner arrived at Clark being 57 years old—and became surrounded by mostly much younger junior faculty and eager graduate students. The atmosphere of the 1950s at Clark was captured by a number of personal accounts in Part III of the book. All in all, these contributions leave a general impression of a senior scholar working actively on the issues that have interested him over decades. Like in Hamburg—or perhaps even more—Werner had a large number of co-workers doing empirical research within his general direction. His junior colleagues helped him to further his thinking and elaborate the empirical research programs in the area of perception (Si Wapner's role in building sensory-tonic theory) and symbol formation (Bernie Kaplan's initiatives—see Kaplan, Bhatia & Josephs, this volume). Yet—unlike in Hamburg—there were no other scholars of comparable caliber in areas adjacent to psychology at Clark as there were in Hamburg. There was no counterpart to von Uexküll in biology, Cassirer in philosophy, or Stern—at any neighboring departments of Clark. The limits of the wider intellectual ***Umwelt*** were

[3] Many of the experiments within the sensory-tonic area were small precise experiments making the central point of subjects' judgments about aspects of the environment being influenced by their state and position of the body. Demonstration of statistically significant differences between the experimental and control conditions in terms of comparison of outcomes became the locally accepted methodological norm (e.g., Goldman, 1953; Kaden, Wapner & Werner, 1955; Krus, Werner & Wapner, 1953; Langer, Wapner & Werner, 1961).

compensated for by an active visiting program. Major thinkers—such as Roman Jakobson, Kurt Goldstein, David Rapaport, Viktor Löwenfeld, Fritz Heider, and others—dropped in at Clark at different times, channeling the graduate students towards appreciation of basic issues in the sciences. Clark in the 1950s was an intellectual environment of buzzing and booming kind, where discussions lasted long, and at times needed to be tempered by Werner himself (see Part III of the present book).

The comparison of intellectual contexts between the Clark and Hamburg environments necessarily is only a parallel—a purely formal one. In reality, everything was different—there were younger co-workers in Hamburg who were (there and then) experiencing first the economic upheavals of the Weimar Republic—and then the slowly upcoming conservatism of the German society around 1930. Of course that culminated in the national socialist ideological cleansing of the universities (among other places)—which many of the co-workers were singled out as "enemies".[4] The World War II was still ahead. In efforts to prepare these young co-workers for any academic jobs that might be available, Stern and Werner organized "emergency Ph.D. exams" (see Kreppner, chapter 2).

In contrast, the young co-workers of Werner at Clark included many who had survived the war, and came back to their university studies with basic existential knowledge that no well-rounded upbringing can give. Similarly to Hamburg, the focus at Clark was for any researcher to do empirical projects. Yet the masters theses and doctoral dissertations at Clark in the 1950s tended to be short, often statistics-dominated focused projects[5]—while at Hamburg these had been longer multi-faceted treatises where empirical data were directly presented. Also the presentation of single case data began to disappear from dissertations done at Clark—while in the Hamburg theses these kinds of data were normatively dominating. Statistical comparisons of group outcome data became dominant over selected examples of individual subjects evidence. The latter may—at times—be presented, but they would not be taken into account in the interpretation as primary evidence.

This difference is of course due to the transfer of the major role in psychology from Europe to North America as a result of World War II, and the increasing mechanization of the social rules of doing psychology as science in the U.S.. So there was no way in the 1950s at Clark that the empirical projects could be of the kind similar to those carried out at Hamburg in the 1920s and early 30s. Furthermore, at Clark there was a tradition of competitive partisanship—similarly to the U.S. political system where Democrats and Republicans fight each other for power, in smaller communities a similar group formation and inter-group competition can be detected. At Clark in the 1950s, there were two basically opposing "camps"—the

[4] Among Werner's closest co-workers—Marta Muchow, who was singled out by the Nazi groups as an "enemy" because of her left-wing political views and being in Stern's Institute that was labeled to consist of Jews or "Jew lovers"—committed suicide on her 41st birthday in 1933 (Miller, 1997, p. 341).

[5] With some exceptions: Bodansky, 1956, 1961.

practicing clinicians versus researchers—both clinical and academic (elaborated in chapter 7 by Lane, Magovcevic and Solomon). This distinction was not a "Clark specialty" at the time—it was a divide that was already then making its way in psychology in North America, and has grown ever since.

There was a further differentiation of groups among the researchers—those who were promoting the study of perception versus the others who were fighting for the primacy of symbolic processes. Both sides were eagerly following Werner's general ideas—and of course both were doing innovative empirical research in their respective areas. Yet they were involved in clashes which perhaps can be likened to an American football game—where each side is competing with the other for winning, while fully depending upon the other for the act of competition itself. Werner—as a senior European professor—was sufficiently distant from that game of opposition to let both sides flourish.

A similar social structure of a research team would have been unthinkable in the context of the Hamburg Institute. Germans of course are no less competitive than Americans, and neither are they less vulnerable to creating inter-group oppositions. The fighting in the 1920s between three directions of holistic psychology in Germany—those of Berlin Gestalt tradition, the Second Leipzig School of Felix Krueger, and the complex-theory of Georg Elias Müller was similar to any inter-group conflict. If anything, the German in-fighting was more extreme than that of its American counterparts, and later took over political tones (e.g., Berlin Gestaltists being in opposition to the Nazi regime, some of the Leipzigers going along with the national socialist ideology). Yet these fights were historically between research groups *in different locations* (e.g., the "Berliners" versus "Leipzigers" fighting of the 1920s had its predecessor in the 1890s in the fight between Carl Stumpf and Wilhelm Wundt—Valsiner & van der Veer, 2000, chapter 7). *Within the same location*—be it a psychology institute in Leipzig, Vienna, Graz, Prague, Hamburg, Breslau, Göttingen, Freiburg, or Berlin—the academic system of ***Lehrstuhl*** (with a leading professor in the head, and some small number of assistants following him) basically ruled out or at least diminished the co-existence and fighting of different "parties". It seems that Werner maintained his European professorial role at Clark—while his younger American co-workers were creating a very indigenously American social system underneath his general leadership.

Werner and Developmental Science

Of course Werner's call for the analysis of processes could not—and did not—change the *Zeitgeist* of the psychology in the U.S. in the late 1930s and later. America was on its way towards the study of large samples using the statistical paraphernalia on the measures of outcomes into a reigning social norm. The focus on individual subjects' data—alone or in a sample—was beginning to disappear (Allport, 1940). This trend has continued in North America ever since (Cairns & Valsiner, 1984; Valsiner, 1986). It has led psychology to lose its focus on the phenomena (see

Cairns, 1986), and has aggravated the issue of how universal scientific knowledge can be related to particular contexts of application (Bibace, Laird, Noller & Valsiner, 2004). Unsolved problems come back to haunt us—and hopefully we can avoid the pitfalls of earlier *impasses* of solving them. Or—bypass the "blocking" role of the social demands.

As can be seen from all the analyses in this book—Werner's own thinking went through an accommodation process as to the ways in which processes and outcomes were viewed—over the rest of his life in North America. Whether it entailed regression or progression is perhaps impossible—or unimportant—to say. Perhaps a more realistic general evaluation is that the life course of Werner's theoretical ideas and empirical work developed along the road with the person-in-context. The road was not simple—neither are the ideas—but in our contemporary world of reduction of complexity to political clichés, it is precisely the systemic understanding of complexity of Werner's ideas that sets the stage for future psychology.

A NEW LOOK AT WERNER AND HIS IDEAS

All of Werner's work has been—from beginning to end—set within a general background focus on developmental facets of any issue he tackled. Yet at different stages of his life course, different issues were dominating others, and different theoretical tools were invented by Werner to handle these issues.

The first stage in Werner's development includes the period prior to arriving in Hamburg—the work in Vienna, and in München. This early period is characterized by interests in music, ethnology, and perception—with only tangential interest in child development (children's construction of melodies is part of Werner's interest in melodies, rather than children per se). During this stage, Werner's ideas were guided by the holistic and dynamic developmental perspectives of Felix Krueger and the "Würzburgers" (Karl Bühler and Oswald Külpe—see Part I of this book). The latter, from Werner's point of view, were "Müncheners"—the brief period of working together wit Bühler in München (after Küple's death) is relevant for the consolidation of Werner's focus on mental processes. The first stage is best reflected in two first books—***Die Urspriünge der Metapher*** (Werner, 1919) and ***Urspriünge der Lyrik*** (Werner, 1924). The two books are actually one (see Müller's coverage of this in chapter 1)—published in different years due to external circumstances. Reading these books gives a full picture of Werner's integrative style—something that later fills the readers of ***Comparative Psychology of Human Development*** with awe. Theoretical points are located in his writings in the middle of multitudes of rich descriptions of examples from different societies—of songs and poetry. Yet it is not the forms of folklore that Werner is here interested in—behind the myriads of examples are the basic general themes: hierarchical order, its dynamics, and emergence of novelty, opposition between person and the world, and the centrality of aesthetic functions in human mind. The first two books are largely ethnological—yet with a clear psychological tonus. Generalized ideas emerge

from the rich multitude of empirical examples—they are not summarized by the author.[6]

The second stage in Werner's development begins with his arrival in Hamburg (chapter 2 by Kreppner) and ends with his arrival at Clark in 1947 (and with the English publications of ***Comparative Psychology of Mental Development***—Werner, 1940, 1948). Here the focus on children—but not very young children—begins to overtake the original focus on issues of art, music, and poetry. The experimental direction begins to dominate over the ethnographic one—yet the latter continues to serve as the crucial source of key phenomena for general developmental claims. The phenomenological centrality of brain damaged patients—the result of World War I—in German psychology of the 1920s led Werner towards increasing focus on pathologies as extensions of the norm. In his ***Einführung in die Entwicklungspsychologie*** (Werner, 1926, 1933), new themes emerge—focus on primitive personality,[7] parallels with psychopathological case materials with those of children at different stages of development are brought in. In the 2nd edition of the book (Werner, 1933) the contributions from von Uexküll's ***Umweltlehre*** are introduced. Likewise, Cassirer's role in the domain of symbol construction began to show in Werner's thinking.

Like Piaget, Werner was a careful collector of specimens. He carefully assembled both phenomenological examples to illustrate key points—from music, art, child psychology, ethnology, psychopathology. In parallel, he—equally carefully—organized the conceptual system that could be used to locate the collected empirical phenomena in a system of functional classes. This classificatory focus was obvious already in his first publication (Werner, 1912), but became differentiated all through his career.[8] Yet Werner's theoretical rigor was tempered by his openness to the richness of phenomena—not all of the concepts used remained the same over his life (see the case of basic developmental concepts, below). Neither was he independent of his immediate social *Umwelt*—who would be? By the end of this second stage of his development he became slowly to resonate with the standard inferential practices of psychology in the U.S. which contradicted his theoretical premises. An organismic theoretical perspective of any holistic kind does not simply fit with the axiomatically additive nature of statistical techniques—such as analysis of variance (which was coming into vogue in the 1950s).

[6] There is an interesting compositional feature that is present in all books by Werner—absence of final chapters that attempt to summarize the crucial general knowledge the author communicates. Instead, these general ideas are presented in the beginnings of the books, and are episodically returned to in the course of the analytic overview of all the evidence.

[7] This focus indicates William Stern's impact upon Werner—he uses Stern's distinction of ***Personalität*** (lower sub-system—including self-maintaining and self-development) and ***Persönlichkeit*** (Werner, 1926, pp. 321–337) when discussing the personality organization of children and mentally ill people. In that ordering, animals would have ***Personalität***—but not ***Persönlichkeit*** (Kreppner, personal communication, March, 7, 2003). Of course in the English translation the distinction is lost (see Werner, 1940, pp. 441–467)

[8] A good example of that effort late in Werner's career was the table of general developmental problems that were to be studied to make sense of the category of time (Werner & Phillips, 1955, p. 15)

The third stage in Werner's development was the "Clark Period". Here his orientation towards gradual addition to his collection of phenomena and concepts takes on a new layer—accumulation of numerous small experimental results. It also accepts the use of statistical methods—the dominance of the analysis of variance was deeply felt in the lives of graduate students at Clark, and the empirical papers that were published—by his students or in collaboration with them—were often eliminating the evidence of the processes through which outcomes were attained. This seems to have been the case for the new work started and developed at Clark. The continuity of the old work—e.g. the introduction of the microgenetic method—where the process focus was central—into English-language psychology (Werner, 1956) utilized empirical data from the Hamburg period (cf. Werner, 1930). Similarly, he carried his take on physiognomics of speech from Hamburg (Werner, 1927, 1929, 1932) to Clark (Werner, 1955; Werner & Kaplan, 1963).

Perhaps one can differentiate two directions within Werner's third stage—a collective and an individual one. The collective one supported the empirical productivity of the students and co-workers at Clark by providing a meaningful general theoretical framework for them. Yet that general framework was not advanced into dramatically new form (see analysis of German and English re-editions of his work, below). The inconsistency between a theoretical process orientation and empirical studies based on outcomes became accepted in the middle of the "main trends" in the psychology in the U.S., in the 1950s. The U.S. society is organized in ways that negotiate its internal power relationships through intra- and inter-community processes at various levels (Mead, 1930/2001). It is a well-functioning social system of dynamics that rely heavily on social conformity while emphasizing individualism as its façade. Hence the individualistically-acting agents (persons, social groups, etc.) are constantly coordinating their social positions with those of the others so as to "fit in" with some always emerging new social consensus.

When it comes to the social organization of psychology within the North American context, the emerging consensus is that of some poorly definable—yet influential—amorphous meaning system labeled "mainstream". In the 1950s that consensus was on its way towards reifying the study of outcomes of psychological processes, through the use of large samples and quantitative methods. The "Clark direction" developed by Werner and his younger colleagues—European as it was in its ethos—could not deviate too far from the growing "mainstream". This led to the loss of some theoretical opportunities—both for Werner and his disciples. Perhaps Werner himself was relatively unaffected—as his individual direction continued to focus on the process orientation. Yet the evidence for this continuation needed to come from the "old" times,[9] and in new research compromises were being made. The orthogenetic principle—a general perspective formulated in process terms—became linked with empirical data of that were based on outcomes of presumed processes. Consistency between theory and data was jeopardized—with the result of lack of further development of the orthogenetic principle itself.

[9] With some exceptions in the course of working on ***Symbol Formation***—see below.

The Dynamics of Multi-Level Order

Werner's key idea—in its most general form—existed long before him. The notion of the orthogenetic principle—hierarchical ordering as key to development was eminent among Goethe's biological ideas. The idea was present in Werner's thinking from its beginning (e.g. referencing J. W. Goethe—Werner, 1924, p. 1; 1926, p. 32), and was elaborated during his years at Clark together with Bernie Kaplan (see Kaplan, Bhatia & Josephs, this volume, also Werner & Kaplan, 1956; Werner, 1957a).

The notions of differentiation and hierarchization run through all of Werner's work over the decades—as a **general principle of natural philosophy**, rather than a specific theory of human development. So, in some sense Werner (similarly to Piaget) connected a highly abstract theoretical level of analysis with concrete phenomenological analyses of different analogical sources (children, primitive societies, psychopathological cases, animal species) **given the particular mental function** under study. What was less developed was the revelation of the process mechanisms of the differentiation and hierarchization process. Piaget, after all, proposed his mechanism of unity of assimilation and accommodation processes. Werner, however, remained satisfied by the generic truth of the orthogenetic principle. The dynamics of emergence—through articulation and integration—was taken as a given—rather than turned itself into the object of investigation, and elaborated.

Focus on Rhythmic Phenomena: In Music, Speech, and Perception

Werner preferred to work on phenomena that represented **polyfigurative** features of reality. Polyfigurative—in contrast to monofigurative—phenomena entail the mutual ingrowing of two (or more) Gestalts (Werner, 1919, p. 218). While static figures form a Gestalt in their immediate figure/ground contrast (these are monofigurative), then dynamic patterned phenomena entail the transition from one figure/ground Gestalt system into another (polyfigurative phenomena). Such transitions mostly occur in time (rhythms, rhymes, utterances, poems, melodies), but they also are present in the simultaneous patterns in space (optical rhythms).

As Werner was interested in showing the phenomena of differentiation, his empirical interest in the production of songs in children, and perception by adults of new melodies ('micromelodies' and 'microharmonies') in minimally different sound sequences (see van der Veer, chapter 3). Increasingly, tones and differences between tones became perceived as less vague (law of increasing definiteness or *Bestimmtheit*), some become more dominant than others (law of the increasing subordination or *Gegliedertheit* of the tones in the system). Listening to music and emergence of new meaning structures of the mind in that process was perhaps the best empirical field for explication of the general differentiation and integration processes.

Thinking in Terms of "Formal Parallels"

Werner's developmental thought inherited from the history of science the controversy around Ernst Haeckel's "biogenetic law". While different proponents or mere (ab)users of Haeckel's comparative idea had been making direct comparisons leading to sameness claims (e.g., "primitive people are the same as children"). For Werner, the general developmental direction—from global to specific forms—would create the "false impression of recapitulation" (Werner, 1940, p. 26).[10] Yet instead of recapitulation what is being observed are genetic (developmental) parallels—an idea based on William Stern (Stern, 1906, pp. 299–300—see also the analysis by Kreppner—chapter 2).

Werner needed the notion of formal parallels—also linked to Felix Krueger's general role in the formation of his thinking (as emphasized by Müller)—for uniting different aspects of his interests. Through than notion he could avoid a number of questions that were beyond his concerns—such as: how is ontogeny linked with phylogeny? How does cultural-historical patterning of "primitive thought" lead a particular person in the given society to display psychopathological versions of such thought? Instead of asking—and failing to answer—these questions that remain unanswered in our contemporary evolutionary psychology, Werner took a "short-cut"—pointing to formal similarities between different phenomena in functional terms, he avoided the question of **macrogenetic emergence**. Macrogenesis would have been the process of development of new forms in one of the lines he preferred to cover by the notion of formal parallels (see chapter 17 in this book—Jonas Langer's effort towards this elaboration).

The Comparative Perspective

Development is creative change—and leads to emergence of new structures (*Neugestaltung*—Werner, 1926, p. 17). Layers of a lower level of functioning are preserved in the case of the *Kulturmensch*. For this reason we can make comparisons between children, "primitive people", mentally ill persons, and so on (see van der Veer, chapter 3). A crucial basis for thinking in terms of formal parallels came to Werner from the flourishing neuropsychology of the 1920s. World War I had—like any war does—created a practical need to understand the psychological functioning of brain-damaged neurological patients—and how to rehabilitate them (Goldstein & Gelb, 1920).

Isolating Levels of Organization

A functional take to look at formal parallels is to probe into the co-existence of different levels of the hierarchically organized organismic structure by selectively

[10] Years later, Werner was even more explicit about the mis-interpretations of the recapitulation notion: "The statement... that the child-like and abnormal forms of behavior, have, in their extreme formulation, aroused just criticism, but criticism which has now become directed toward undermining comparative developmental psychology as discipline" (Werner & Phillips, 1955, p. 8).

blocking the higher level (to see how the lower level functions), and vice versa. This strategy has been utilized in neuropsychology—often because of the "natural experiments" that a brain injury creates for the psychology of the person. A brain injury can create an artificial separation of the higher and lower levels of mental functioning. Creating methods that would demonstrate which task conditions make the difference between psychological functioning at the higher or lower level was the core of functional neuropsychology of the holistic tradition (Gelb & Goldstein, 1920). Werner made use of similar techniques—to show how feeling and perceiving can be dissociated (Werner and Creuzer, 1927).

What is "Formal" in "Formal Parallels"?

Werner preserved the notion of cross-species, cross-societal, cross-age, and normal/pathological comparisons in terms of formal **generalization**—hence the focus on formal, rather than specific, parallels in terms of **generalized similarity**, and not sameness:

> For all practical purposes, one may speak of a principle of parallelism: development in mental life follows certain general and formal rules whether it concerns the individual or the species. Such principle implies that, apart from general and formal similarities, there do exist specific material differences in the comparable phenomena. (Werner, 1940, p. 26)

For Werner (and for the developmental science of our times) the focus on comparison between different phenomena was the core of any science. While it was obvious that **formal sameness** of two compared objects—X and Y—would not fit a goal of any science (as it disallows generalization: if X is the same as Y, then {X and Y} = {X and X}, and there is no knowledge found in this transformation).[11] Science operates through comparisons that bring out similarities together with differences—and will arrive at generalizations precisely on the basis of both. Hence Werner's focus on **formal similarities** ("parallels") emphasized both the generalizing function of science on the one hand ("formal") and the phenomenological similarities on the other. The choice of formal parallels was taken for granted by Werner—as a starting point for inquiry (see chapter 3 by van der Veer).

The use of the notion of formal parallels made it possible for Werner to draw his evidence creatively from varied areas of knowledge—history of language combined with people's interpretation of artificial sentences (Werner, 1954), development of children and mentality of apes or psychiatric patients, etc. Yet the formal parallel operated as a given—it allowed the weaving together of evidence from many sources, yet blinding the researcher from the issue of emergence of the

[11] This transfer of sameness is a widely used meaning maintenance strategy in different religions—a particular deity X is actually deity Y who is also deity Z who is also deity X.

established forms. For example, a particular form of a child's thought of "primitive" kind is compared—through formal similarity—with similar phenomena among adults of a tribe in Africa. No doubt the formal parallel is adequate as to the description—localization of the phenomena within Werner's grand scheme. Yet each of these phenomena have had their own developmental histories that are quite different from each other—one ontogenetic, the other ethnogenetic. Which that history is not denied in general—but it is also not illuminated in particular. Instead, it becomes classified—into similarity groupings arranged in time (stages). In Werner's case—similarly to other developmental researchers with strong phenomenological orientation (Jean Piaget, Charlotte Bühler), the use of stage accounts started to dominate the inquiry. The issue of transitions between the stages became a given—a "black box" not easy to open.

One Book, Two Trajectories: The German and the American Development of Werner's *magnum opus*

Similarly to his colleagues in Hamburg—Ernst Cassirer (1923, 1926, 1929) and William Stern (1918, 1924, 1935)—Werner created a synthetic system of developmental thought which integrated—at every new step—the available empirical evidence of the time. The ways in which the integration was set up differed for Werner in the different editions of his *magnum opus*—***Einführung in die Entwicklungspsychologie*** (Werner, 1926, 1933, 1953, 1959) in German on the one side, and its English language parallel—***Comparative Psychology of Mental Development*** (Werner, 1940, 1948, 1957, 1961, 2003). While the latter emerged from the former (Werner, 1940 is based on the German edition of Werner, 1933, but modified by new evidence), the German versions of the book did not undergo changes based on the two modified English versions (Werner, 1940, 1948). This can be illustrated by a look into Werner's conceptualization of basic oppositional concepts—of developmental psychology *(wichtige entwicklungspsychologischer Begriffe*—Werner, 1926, p. 38).

Basic Developmental Polarities

As van der Veer (chapter 3) already showed, Werner (1926, 1933, 1940, 1948) posited the relevance of three domains for basic terms to be used to organize psychological phenomena. Some of these terms were already used by him before. Already prior to coming to Hamburg, Werner distinguished between homogeneous and non-homogeneous, centered and uncentered, and diffuse and ordered Gestalt types—(see chapter 2 by Kreppner). Thus, he defined rhythm as "articulated, centered [*gegliederte, zentrierte*] Gestalt" (Werner, 1924, p. 114).

All in all, Werner's system of basic developmental concepts includes three classes of two bi-polar concepts in a class. Each of the three classes consists of a pair of opposites—concepts that would regulate the developmental processes:

Class 1—referring to the **meaning** of the phenomena:

1) syncretic[12] [**Komplex**] ← → discrete [**abgesondert**]
2) indefinite [**unbestimmt**] ← → definite [**bestimmt**]

Class 2—referring to the **structure** of the phenomena

3) diffuse [**diffus/global**] ← → articulated [**gegliedert**]
4) vague [**verschwommen**] ← → clear [**prägnant/artikuliert**]

Class 3—referring to the **dynamic properties** of the phenomena (Werner, 1940, p. 55)

5) **rigid** ← → **flexible**
6) **labile** ← → **stable**

It is an interesting developmental side of Werner's own construction of the conceptual field that not all of these six oppositional terms are present equally in his thinking—and in the two different versions—English and German re-editions. Thus, in all of the German editions (Werner, 1926, pp. 38–44; 1933, p. 35–36; 1936, p. 44–45; 1953, pp. 35–37; 1959, pp. 35–37) only the first four are used. In the English versions, three of the first 4 German concepts are (in that order: #1, #3, #2), followed by #5 and #6. The **vague** ← → **clear** opposition #4) has been dropped in the English versions (Werner, 1940, p. 53; 1948, p. 53).

The last two of the polar terms—**rigid** ← → **flexible** and **labile** ← → **stable** make their appearance in the first American edition with brief descriptions (Werner, 1940, p. 55) and continue as such through the English-language line of Wernerian terminology (Werner, 1948, p. 55). Yet they were not elaborated—even as late as in 1958 some of his co-workers pointed out that Werner preferred to explain the **rigid** ← → **flexible** continuum by way of the major structural (**diffuse** ← → **articulated**) and functional (**syncretic** ← → **discrete**) oppositional pairs (Brooks & Phillips, 1958, p. 269). This can be linked with Werner's focus on issues of rigidity/flexibility as object of investigation in the post-European years' concentration upon handicapped children (Werner, 1946a, 1946b). As an object of investigation it had centrality in the world view of the scientist, yet use of the notion in terms of a major organizing vehicle these remain ambiguous. It is therefore notable that Werner failed to introduce the **rigid** ← → **flexible** and **labile** ← → **stable** terms into the post-war German editions of his *magnum opus* (Werner, 1953, 1959). In his own thinking of the American period, the centrality of the opposition is constantly visible (Werner, 1946a; Werner & Kaplan, 1950, pp. 89–92).

[12] The term ***syncretic*** as a basic concept appears first in the 2nd German edition—Werner, 1933 [*synkretisch*]—and is repeated in subsequent editions. Yet it was used descriptively in 1926—referring to Piaget (Werner, 1926, p. 243).

In Werner's use, these oppositional terms constitute an organizational framework—a kind of theoretical map—for description of psychological phenomena from different areas of psychology. A reader of his main work can enjoy (or suffer) the at times bewildering transitions that Werner makes between reporting experimental evidence from adults, observational or diary evidence from children, ethnological materials about language or practices of far-away societies, and data from cases of psychopathological or neurological kinds. All these sources of evidence corroborate an investigative point about the existence of specific forms of mentality (e.g., "complexive" or syncretic thought) and its development into new levels of organization (e.g., "primitive abstraction"→ intentional organization of materials → categorization, etc.—Werner, 1937, pp. 357–358). The totality is viewed by Werner as differentiating and centralizing (hierarchization) process. For that purpose, the 4 (or 6) conceptual pairs provide a framework within which to locate the phenomena—yet they do not explain development.

The story of the history of oppositional basic concepts (or- formal dimensional coordinates) becomes even more interesting in its transformation in the U.S. context after Werner's death. Jonas Langer (1970, pp. 745–746) makes use of four of them. For Langer, the central dimensional coordinate is **syncretic** ← → **discrete**, while for the structural aspects of development the **diffuse** ← → **articulate** opposition is set. The other two concept pairs considered relevant by Langer are the **rigid** ← → **flexible** and **labile** ← →**stable** kind. The **indefinite** ← → **definite** concept has disappeared by 1970.

The differences in the functional lists of basic concepts—between Europe and North America—indicate the emergent status of the conceptual system itself. The concepts used are physiognomic themselves—yet pertain to high-level abstraction at the same time.

Werner's Central Concern: Parts/Whole Relations

Like any other scientist—Piaget, Vygotsky, Luria—who dealt with complex and growing phenomena, Werner's interest was focused on establishing general principles of how parts are included in a new whole—and how the whole-quality modifies the psychological status of the parts. This focus follows logically from Werner's position on the primacy of the whole ("creative analysis"—see above). It leads to further development of the co-existence concept (Rapaport, 1941), and to the general metaphor of orchestration—the point made powerfully by Bibace (chapter 14 in this book).

Werner's initial dedication to music—and his continuous use of musical examples over his long life-work in psychology—can be seen as parts that have led to the emergence of the whole in this focus. Werner's early (Vienna-period) studies of children's constructed melodies (Werner, 1917—see also Müller, chapter 1) were the basis for seeing how time-space wholes (melodies, sentences, pictographic translations of complex ideas) differentiate and arrive at an organized form.

Already in Werner's very first publication—at his age of 22—did he emphasize the objectivation of feelings-concepts (***Gefühlsbegriff***) out of feeling-complexes (***Gefühlskomplex***—Werner, 1912, p. 57).

The Feeling of the Whole: Physiognomics Extended

Ever since his first interests in primitive mentality (Werner, 1919, 1924), the centrality of total organismic relation between the person and the world was the core of Werner's approach. The central notion of physiognomics is that of *inspirational expression* (***Beseelte Ausdruck***—Werner, 1929, p. 338). A certain expression—of another person, or of natural objects—is perceived by the physiognomically operating person in terms of **general sensefulness** that is immediately available. Based on that personalized feeling with the perceivable expression, meanings can emerge. The parallel with Vygotsky's borrowing (from Paulhan) of the sense/meaning distinction and its dynamic elaboration by both Werner and Vygotsky are notable (van der Veer & Valsiner, 1991, ch. 16).[13]

Inspirations of course are cultivated by relaxed and frivolous attitude towards living. Different kinds of physiognomically based methods that became the trademark of the Clark "symbol formation" direction in the 1950s were put into action much earlier—in less serious contexts than those of a laboratory. Thus, during a key meeting of German Gestalt psychologists in Rostock in 1928, as Fritz Heider recollects, the crème of the crop entertained themselves:

> In the evening, Wertheimer entertained us at the piano. I enjoyed his special physiognomic game for the first time: he would play a melody, and the rest of us would try to guess which of the group his melody portrayed. (Heider, 1983, p. 89)

In the first years of the 21st century, Bernie Kaplan has been going around in the corridors of Jonas Clark Hall, suggesting that people match a set of graphic images onto the images of existing Clark psychology faculty. Research on graphic expression was one of the major themes popular in the Hamburg Institute (e.g., Krauss, 1930). All this indicates the basic nature of human psychology's capacity to construct a new sense on a physiognomic basis. That sense can be constructed quickly, and with little insight into the construction process itself.

All in all—the basic nature of physiognomic relating to the world remains an easily demonstrable fact of human psychology. But what does it mean for general theory of human development? While the sensory-tonic theory was a framework for many ingenious experiments proving conclusively the effects of the "tonus imbalances" in many ways (see Wapner, chapter 6), its theoretical productivity was questioned already at the time of its heightened use. Thus Kurt Goldstein—one

[13] There are more links with Russian—in late 1920s—Werner also used materials of the Russian language to demonstrate the ***Gesamthabitus*** of a language (Werner, 1929, pp. 356–363).

of the originators of the use of the tonus concept—recognized the limits of the sensory-tonic theory:

> Our experiences with patients...suggest that the tendency towards stability—as important as it is as a general principle for understanding organismic behavior—is not sufficient to account for why—given the same stimulation and the same modification of the stimulation in pathological individuals—stability may be attained in quite different ways; indeed, in ways antithetical to each other. (Goldstein, 1960, p. 116)

Goldstein suggested the notion of self-realization to capture the tendency to transcend the theoretical limits of the sensory-tonic research program at Clark of the 1950s. In other terms—an equilibration notion is a necessary—but not sufficient—basis for developmental science. This was recognized in subsequent efforts to reformulate the sensory-tonic theory (Wapner, Cirillo & Baker, 1969), yet the nearness of the theory to non-developmental outcome data from undoubtedly phenomenologically ingenious experiments did not make development of the theory possible.

The sensory-tonic theory had no better solution to the developmental issue than Piaget had in his theory. Piaget moved to emphasize the progressing equilibrium (*equlibration majorante*) notion. The founders of the sensory-tonic theory had no clear concept of dealing with re-structuration of the *equilibriae* entailed.[14] Werner found a solution within the realm of symbol formation processes, recognizing the spiral nature of development (Werner & Kaplan, 1952, pp. 99–100; Werner & Kaplan, 1963, pp. 186–188). The developing person "moves outwards" from the physiognomic field—and establishes a meaning. This "upward curve" within a spiral (helical) development can be reversed under new circumstances, and the person may "move back" towards the physiognomic field—for instance under conditions of perceived danger (Wapner, Werner & Comalli, 1956), only to make another "upward" move. The multi-level organism is ready to adaptively cope with its environment at multiple levels.

The Crucial Insight of Werner's Approach to Meaning-Making

Words are a form of abbreviated poetry. Hence it is not surprising that Werner's interests in music gave rise to other time-gestalts like poems and speaking, ending up with the crucial issue of formation of symbols. Words allow the person to transcend the physiognomic basis of immediate relating with the world—yet in ways that retain traces of that original basis. The whole research program on the physiognomic speech (Werner, 1929, 1932) was set up as part of a wider scheme of "general physiognomics" (*allgemeine Physiognomik*)—an ambitious idea that was

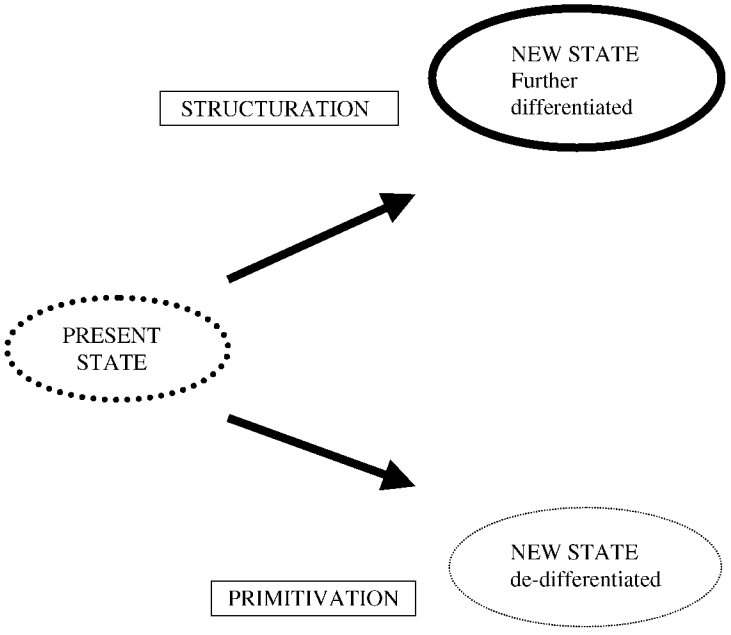
[14] This problem has remained unresolved within the sensory-tonic theory since the 1950s. It has been linked with different "-st" perspectives (transactionist, constructionist) that have flourished in psychology, but there has been no theoretical solution to the specific issue—see Wapner and Wapner and Demick, this volume.

partially put to practice in the Clark years in the framework of sensory-tonic theory.

Werner's look at words was in direct opposition to the notion of arbitrariness of the link between sign and referent. He did not deny this arbitrariness as an end result of the developmental process of meaning formation, but his interests were clearly at the "beginning end" of the making of this connection—the nearness to the physiognomic base was almost always there.

Experimenting with Words

As an experimentalist, Werner created developmental methods that involved the process of transformation of a given state of affairs (e.g., a meaning of a word that is already established, or a general feeling of something that has not yet been structured) into another. He was methodologically consistent in his procedures—with his general theoretical focus on differentiation and hierarchization. His experimental techniques in the domain of symbol formation were either those of **primitivation** (the de-differentiantion line), or of **structuration** (through distancing, abstraction, guidance towards further differentiation):



Strictly Developmental Methodology

These two lines in developmental methodology (in Introduction these were referred to as ways to test "upward"—structuration—and "downward"—primitivation—movements) are the core for all developmental science. There is

substantial analogy with Vygotsky's "method of double stimulation". If one were to add to the above scheme the use of cultural means—action tools of signs—into the arrows representing structuration or primitivation—a vygotskian experimental scheme would result. Werner's viewpoint was clear—any developing system at the given time exists in some state of organization. From that particular state it is possible—by experimental intervention—to trigger the processes of its further reorganization (*Gestaltung*) in these two directions. Experimental probing into either of those allows us direct empirical access to the processes of development. This resolves the seemingly paradoxical methodological claim of James Mark Baldwin (1906, see also Introduction to this book) of under what conditions development can be studied.

The person is active constructor of the holistic relation between one's body and the environment. As long as that relation is within the confines of the organism's handling of environment as it is a physiognomic object, the differentiation processes do not require the psychological move out of the here-and-now state. But the emergence of signs—in the structure of the whole relation—makes a cardinal difference. This is precisely parallel with Lev Vygotsky's methodological innovation ("method of double stimulation"—Valsiner, 2000, pp. 78–81). Yet—in Werner's version—the signs are internal to the existing organism-environment relations—some parts of that relation take on a new function—that of representation—and differentiate into signs. Hence signs remain closely connected with the representing organism—as they are **embodied in the structure** of its relations:

> ... the organism may take the sensory material which otherwise is transformed into an object, and utilizes this sensory material for the purpose of representing objects and relations. Such sensory material—in the service of representation—is so shaped by the organism that it may sustain a relation of similarity to a formed object which it is taken to represent. This similarity which is only rarely manifested on the surface (e.g., onomatopoeia) is ... always operative in the internal experience of the organism. (Werner & Kaplan, 1963, pp. 484–485)

Hence there exists distancing between the "outer" and "inner" domains of the organism—created in human species through the emergence of embodied signs. Signs "grow"—in the sense of differentiation and hierarchical integration—out of the organismic whole. Yet they remain tied to the whole—they remain parts of it, albeit differentiated parts.

Given this focus on growth of the signs, it is not surprising that the majority of empirical studies on symbol formation under Werner's guidance were building on the closeness of constructed signs to the organismic functioning. The centrality of some de-differentiates state is visible in all studies. Consider, for example the technique of **linear schematization**—task to a subject to represent a word, a phrase, or a sentence by a linear drawing (see chapters 20–23 in Werner & Kaplan, 1963). The explicit rationale for this task was to undo the automatization that exists in the case of the verbal channel where meanings of words are already established

and their physiognomic base is no longer visible (A Proposed Program, 1950, p. 3). It is an example of primitivation experiments (see Introduction)—a phenomenon at higher level (word, phrase, sentence) is forced to undergo re-structuring on a level *lower* than itself (linear scheme drawing). By breaking the established structure (and function—automaticity) the system is forced to re-organize—and the actual process of development becomes visible to researchers at the period of such reorganization.

The move into using drawn linear schemas as vehicles for expression of meaning is continuous with Werner's original interest in looking at polyfigurational Gestalts. Drawing a meaning of a word, or of a sentence, is similar to child's construction of a melody. The roots of the linear schematization technique itself are in the physiognomic recognition of emotional tone qualities of graphic schemes—Werner's co-worker Möhring tested people's assignment of "merry" and "sad" qualities to different line drawings in early 1930s (Werner, 1932, p. 145).

Sign Construction as Context-Bound Distancing

As Kreppner pointed out (chapter 2), the emergence of a context-oriented and culture-specific thinking in Werner's publications in the Hamburg period bears all traces of influence of Ernst Cassirer's classic work. The question of word meanings—physiognomically addressed—is that of figure/ground relations.

The whole sign construction process starts from the physiognomically organized field that is not yet differentiated (Werner, 1927, 1932). It gradually moves "outward" from it towards abstracted meanings that eventually lose the initial history of emergence. Due to the loss of initial linkages with the physiognomic field these signs can be re-contextualized—or **re-physiognomized**—when the context of meaning making demands it. Thus, the same word—*stone*—can be considered *brilliant* when situated in a poetic context, and *cold* when in tactile context—by the same person (Lillian Raeff's work, cited in Werner, 1955, p. 15). The roots of the idea of the word transcending the physiognomic field comes from Ernst Cassirer in the 1920s:

> In analyzing language, art, myth, our first problem is this: how can a finite and particular sensory content be made into the vehicle of a general spiritual meaning? If we content ourselves with considering the material aspect of the cultural forms, with describing the physical properties of the signs they employ, then the ultimate, basic elements seem to consist in an aggregate of particular sensations, in simple qualities of sight, hearing, or touch. But then a miracle occurs. Through the manner in which it is contemplated, this simple sensory material takes on a new and varied life. When the physical sound . . . is formed into a word, it becomes an expression of the finest intellectual and emotional distinctions. *What it immediately is, is thrust into the background by what it accomplishes with its mediation, by what it means.* (Cassirer, 1953, p. 93, emphasis added)

Werner's notion of words in context was thus a result of the tension between separation of the emerging symbolic forms from the backgrounds (the Cassirer

focus) and the continuous embeddedness of the meaning-making person within that background (the experience notion of William Stern). A particular empirical technique—the World Context Test—was built at around that tension.

The Word Context Test (WCT)

The WCT included artificial words that were embedded in sentences. The subject has to guess the meaning of the artificial word after reading each (of 6) sentences including that word. The artificial word is re-situated in different sentence contexts—with the assumption that the person attempts to abstract its meaning from the comparison of these contexts (Werner, & Kaplan, 1952; Werner & Kaplan. 1963, pp. 190–200). The researchers were interested in how the switching of contexts around the artificial word triggers the process of meaning specification (Werner & Kaplan, 1954, p. 135).

The WCT allowed to probe for the ways in which the person begins to differentiate the word (unknown)—sentence (understandable) whole.[15] It is an experiment of the structuration kind, triggered by the insertion of an unknown word (e.g. "a *corplum* may be used for support" vs. "a *stick* may be used for support"). It is important to note that the artificial word inserts were constructed so as to be far from the physiognomic field. Hence tension is created between the established (automatized) sentence frame ("*SOMETHING* may be used for support"). When the subject attempts to assimilate the unknown word into the known (but confused) structural base (of the sentence), the processes of meaning construction become visible. The WCT is a concrete example of how strictly developmental methods can be constructed. It is admittedly artificial—since the artificial words are assumed to possess meaning that needs to be discovered. The opposite to the WCT would be word meaning primitivation tasks—instructing subjects to repeating a word in a monotonous rhythm until it loses its meaning (Miller, 1961, p. 16), or combining required action with the opposite of the word meaning (e.g., the subject has to push an object while uttering the word "pull").

Meaning Construction as Re-Structuring

Werner's revolutionary achievement is to re-direct the research on meanings from abstracted external signs to embodied internal—organismic—transformation of meaning-making vehicles. In contrast to the views that the sign ⇔ referent relationship is external (signs become linked with their referents through an associative process—by contiguity), for the organismic-developmental viewpoint

> ... the relationship between a symbolic vehicle and its meaning is **internal**, the vehicle is structured by speaker or listener so as to represent a referent, that is to embody and not merely recall the meaning. (Werner & Kaplan, 1963, p. 488)

[15] There is a parallel in this technique with the Ach-Sakharov-Vygotsky "block classification" procedure—where the discovery of the syllabus written on the block when turned over provides a new step in information integration for the category discovery (see van der Veer & Valsiner, 1991, chapter 11).

Werner was consistent all through his academic life course in his insistence on the primacy of the whole—viewing development as re-structuring of the previous whole at the same level, as well as at hierarchically higher as well as lower levels. This basic theoretical credo is being re-invented at our times—and with little focus on structures that transform themselves—by Dynamic Systems Theory (van Geert, 1994, 2003). Moving between abstract philosophical concepts and precise experimental set-ups and clever probes, as well as bringing in parallels between species, societies, and persons, Werner left a rich heritage for our contemporary developmental science.

LIMITS OF THE SYSTEM: WHAT WERNER DID NOT DO?

An investigation into the life-work of a major figure in a science cannot stop at listing his accomplishments. It is equally important to point out what the thinker did not do—but could have. The core author may have had good reasons of his own not covering the areas what we might now consider "gaps"—but in our taking his ideas forth into new forms a focus on instances of lacking focus.

Reviewing the first edition (1940) of the ***Comparative Psychology of Mental Development***, David Rapaport revealed a curious "blind spot" in Werner's developmental theory:

> Werner shows us the levels of structuralization of the different functions. We learn from him that there is a meaningful lawfulness and even a dynamic lawfulness implied in the structuralization of these functional levels. He shows us that the different functional levels are not possessed exclusively by a group of living creatures but that even in the civilized human beings of our times, the different lower levels are coexistent with the highest ones. He shows us that the lower functional levels cannot be considered immediate historical predecessors, of the higher levels, though they may be analogous to these predecessors. However, *we hear from him nothing about the relation of these different structural levels to the development of the dynamics of the personality as discovered by psychiatric and especially psycho-analytic investigations.* The organism is considered as a whole, the functions are dealt with as an aspect of the life of that organism. Even the problem of personality organization is dealt with, but *no developmental theory of personality dynamics is touched upon.* (Rapaport, 1941, p. 431, added emphases)

Rapaport's comment is of course positioned from the viewpoint of psychoanalysis—yet he points to a wider issue in Werner's theory as a whole. While it is true that Werner avoided the use of psychoanalytic argumentation, it seems that his thinking over the Hamburg years was very close to the theoretical credo of William Stern (see Kreppner, chapter 2). There is a clear focus on person-environment dynamics in that general "Hamburg Credo"—without the use of psychoanalytic explanations. Instead, Werner can be viewed as intellectually close to Karl Bühler (with whom he worked in Munich before moving to Hamburg) and the socio-cultural tradition of Lev Vygotsky and Alexander Luria with whom he was

directly connected—aside from being one of the few to refer to Vygotsky's work in English language psychology (cf. Werner, 1937, p. 367).[16]

Yet the claim of Werner not providing a thoroughly developmental theory of ontogenesis remains an interesting one. The relations between the highest abstract level of the system—the orthogenetic principle—and the specific empirical studies remains one-sided: empirical studies adequately fit the explanation of development in terms of differentiation. However, the abstract sides of theory are not innovated by the empirical evidence. It seems that there are parallels with the contributions of Piaget here (Valsiner, 2001). Piaget—like Werner)—was primarily an empirically oriented phenomenological researcher who described complex phenomena at different age levels. Both used a version of stage accounts—description of similarity classes organized over ontogenetic time. Werner's set of stages was less elaborate than Piaget's—yet they can be viewed as analogous. Piaget formulated his theory of development—that of equilibration—long after he had published a myriad of rich descriptions of children's thinking and acting classified together into stages (Chapman, 1988). Sure, Piaget's theory was living in his young Werther's self long before he devised his stage accounts (Vidal, 1994) and guided his observations—yet the formal theory took time to be formulated. Werner's orthogenetic idea was there from the beginning—and it led him to open new alleys for productive empirical inquiry. Both Piaget and Werner stopped at some key moment in the development of their theories—a natural result of a longer life course in science. Their theoretical structures remained in the public domain—open for other scholars to advance further.

Making of a "School"—or Preparing for Future?

The very notion of a "school of thought" in any science is a classificatory notion. Even as there has been constant group making by psychologists who had not studied at Clark that there existed a "Wernerian school", this attribution is at times denied by the people who experienced the Clark environment in their graduate school days:

> Werner is not the founder of a school . . . More than anything else, what he provided his students with was a way of questioning experiences and data, and a freedom to do such questioning without imposed limits. Werner allowed his students to differentiate themselves from him with the full knowledge that he had provided them with an integrating conceptualization. Perhaps in this respect he will have provided psychology—so full of narrow, provincial schools—with the model of the true teacher. (Morant, 1966, p. 77)

[16] Werner knew of the work of Vygotsky, Luria and Leontiev soon after the publication of the three papers in English in Journal of Genetic Psychology (Leontiev, 1932; Luria, 1928; Vygotsky, 1929)—as is evident from handwritten notes taken from these publications (Werner's Personal Library). He was in direct contact with Luria who send him his publication on children's writing (Luria, 1929) which was referenced by Werner (1933, p. 416). Werner included Luria's work on conflict into his course at Harvard in 1937. Vygotsky's thinking on internal speech was appreciatively referenced (Werner, 1937, pp. 366–368; 1944, p. 233).

The contributions to the present book show the variety and versatility of the impact of the Clark context in the 1950s and 1960s. Many of the former graduate students who remember Werner fondly (Part III of this book) have not continued as "Wernerians"—but as scholars with open minds who have moved in new directions in their thinking.

Between "Schools" and Science: Use and Abuse of Theories

Werner's problem was probably the same that any creators of grand theories encounter—the highest level of the theoretical constructions—in his case the orthogenetic principle—may be necessarily true already on the basis of axiom choice. Unless these general ideas are translated, step by step, into less general ones—ending up with empirically testable hypotheses that might lead to re-building the theoretical hierarchy—the "grand theory" has the danger in being turned into an "umbrella-kind" all-encompassing cover for many empirical efforts (see Valsiner, 2000, pp. 64–65). This has happened with all major popular theoretical systems of the 20th century—Vygotsky's, Piaget's, Einstein's, G.H. Mead's, Freud's, and others. Werner's general notions are certainly easily (ab)usable as fixed truths—yet it is clear that fixing theories makes them incapable as tools for understanding dynamic reality. A finished theory is easily turned into an orthodoxy—to be followed, rather than utilized as a tool in further inquiry. The danger for science is not the physical death of a theorist—but the slow death of her or his theory—in the hands of followers who turn it into an unalterable shrine.

Arenas for Developmental Science

Our analyses of Heinz Werner's contributions come to their end. The themes that emerge from it are all very new—expressed (but not developed) in our contemporary developmental science. As was emphasized in the Introduction, the general perspectives of our contemporary developmental science map almost fully onto the Wernerian perspective—once slight adjustments to specific terminology (e.g., physiognomics, primitivation, orthogenesis) are made.

This closeness need not be surprising to anybody. Since it is the issues of basic science of development that are at stake, the range of possible theoretical solutions for how to make sense of it is rather clearly circumscribed. It entails the necessity of taking the reality of time seriously. While non-developmental sciences in any content area—psychology, biology, sociology, anthropology, to name a few—can avoid the issue of time and questions that are linked with it (such as: change, emergence, progression, regression, mutation, catastrophe, etc.), developmental sciences are distinctive precisely because they study such issues. Developmental science is in some sense the science that studies whatever the non-developmental sciences have left aside as "error" (or ontologically non-systematic fluctuation). But how can it do it? It is here that the history of the whole

research program that Werner created during the fifty years of being active in science.

Investigation of Wholes-in-Time

As long as developmental science deals with organismic phenomena—and this is a given since only organisms can develop—the issue of *systemic organization of the whole* is the primary question to answer. Werner's focus on part/whole relationships within time—fortified by his interest in rhythmic and time-extended phenomena—can provide new leads to contemporary developmental science. As an example—the issues of identity formation, or self organization (in children, adolescents, or adults) are habitually viewed in contemporary psychology as if these were fixable detectable) entities—"have" an "identity", "develop" an "identity" or "interdependent" self.

An alley of investigation of these themes that borrows from Werner can re-orient the "having X" into a question of "doing X", or "being-in-X" (e.g., "being-in-identity", "being-in-self"). Self (or identity) can be defined as rhythms in the unity of "selfness" and "otherness" that operate as mutually included opposites. In order to "be oneself" the person has to "be another", and by "being another" one reconstructs "being oneself". Undoubtedly this suggestion is close to the dynamic ideas of self brought into social sciences by George Herbert Mead (Mead, 1912, 1913) but the dynamic elaboration of this rhythmic attempt is grossly underdeveloped. It is only within the tradition of "the dialogical self" (Hermans, 2001, 2002) that the notion of re-positioning different parts of the self is being conceptualized. Yet this is still a far cry from considering self or identity as rhythmically operating systems of opposite parts that re-construct one another, and lead the helical nature of self-development. Some theoretical groundwork for that exists—the rhythmicity of wanting to be far from the here-and-now and being in the given situation has been described (Boesch, 1998). The issues of alterity are becoming central for making sense of the self (Simão, 2002). Systems-theoretical views on social group integration have also begun to unravel the dynamic rhythms of the interpersonal processes (Gottmann et al, 2002).

The issue of time as inherent in development leads to the question of units of analysis. First, these units are systemic structures (not elements)—minimal gestalts. Secondly, these minimal gestalts are open for transformation. Thirdly, each of these units of analysis unites its own PAST and FUTURE through the processes of moving through the PRESENT. In other terms—units of analysis possess the property of historicity. What is observable in development at the given moment has its history in the past—and is oriented towards the future. All developmental adaptation to the conditions of the environment is in essence **pre-adaptation** to the **potential range** of conditions of the relations with the environment in some moment in future. Werner's focus on issues of variability in the phenomena—temporal variability, as well as co-existence of different organismic levels that can be catering for specific needs differentially—is of crucial value for developmental science. It opens new possibilities for contemporary cognitive and evolutionary psychology as well.

Investigation of Dynamic—Yet Stable—Hierarchical Orders

The focus on the study of multi-level hierarchical systems has been emphasized in recent decade in the discussions about **probabilistic epigenesis** (Gottlieb, 1997, 2003) of development. In psychology at large—including here child psychology as a hybrid of developmental and non-developmental perspectives—there has been a tension between structuralist and functional approaches. Theoretical constructions have treated these two as disunited opposites. In contrast, Werner's tradition give us ample examples of how different levels of structural organization of a phenomenon can be analyzed as co-existing, and how new structure at higher or lower levels of hierarchical organization can be triggered to come into being in experimental or real life demand settings. Yet in both frameworks—that of probabilistic epigenesis of contemporary developmental science, and that of Werner's look at hierarchization—there is a missing link. By calling a process of inter-levels construction "probabilistically epigenetic" or "differentiating and hierarchically integrating" the scientists have only specified the arenas for further inquiry. They have not yet created a set of theoretical models that link the general process focus with the actual analysis of the epigenesis or differentiation process. Examples of how to accomplish such phenomena-near theoretical schemes can be located in Werner's research program (e.g., Bodansky, 1956, 1961).

Strictly Developmental Methodology

Contemporary developmental science cannot claim to be a success unless it radically re-organizes its methodological toolbox. Since developmental phenomena are in their primacy qualitative—it is the qualitative methodology that is central in developmental science (Mey, 2000, 2003; Smith & Dunsworth, 2003). Quantitative methodologies play a secondary role—they are helpful if appropriate for the questions asked. These two types of methodologies are not in conflict—the quantitative side is a special case of the qualitative direction (Valsiner, 2000a). In fact, the two directions stem from the same basis—perceptual process of detection of figure from ground that leads to their unity in the context of nominal scale data. It is beyond the nominal scale that the quantitative direction diverges from the qualitative in its step-by-step development (Laird, 2004).

Strictly developmental methodology—qualitative or quantitative in nature—benefits from the development of formal analytic systems that capture the **processes of transformation of the structure**. This is in line with the legacies of most leading developmental scientists of the past—Lev Vygotsky, Jean Piaget, Heinz Werner, James Mark Baldwin, and others. Contemporary mathematics offers some leads in that direction (Nesselroade & Molenaar, 2003; see also Valsiner, 1997, chapter 3), but the input of basic (qualitative) mathematics into the problems that were left unsolved in Werner's paradigm of differentiation would lead to formal methodology of the study of development. The traditions of statistics as those are inculcated in our contemporary psychology education (see Gigerenzer et al, 1989) are simply misfitting with the axiomatic bases of developmental science.

Overcoming the Anonymity of "The Literature"

Werner's (like Piaget's, or Vygotsky's) life course in science entailed systematic, multi-faceted, and phenomenologically focused efforts to understand how the selected processes are organized. The goal was not "to contribute ***to*** the literature" on these topics. Instead, Werner (and his peers) **created** "the literature". Publication at Werner's time was not (yet) a build-up of "academic capital" (in Bourdieu's sense) but exchange of information about ideas and empirical findings between different—at times fully disagreeing—fellow scientists.

Of course the functions of academic publications have changed in the past half a century, and nowadays we hear the positively valued goal given to young researchers to "contribute to the literature". Instead of clear authorship of ideas (e.g., Werner's, or Vygotsky's) what we now tend to look for is some mechanistic consensus between some group of researchers, or in the empirical data (e.g., results of a meta-analysis of empirical findings pooled across many studies). The individual researcher vanishes in the faceless "literature" almost as surely as the individual subject has vanished from the empirical core of scientific psychology (Valsiner, 1986). Yet it is obvious—on social-psychological grounds—that group consensus does not automatically result in greater understanding of basic processes or practical application of general knowledge. It can produce collectively shared illusions as easily as using one another's perspective for multi-sided treatment of an issue.

The example of Heinz Werner—and all of his and his co-workers' research productivity—for contemporary developmental science is that of standing out **from** "the literature"—being "**above and beyond**" the "literature"—rather than are mere equal parts of its all-leveling collective anonymity. It is only "normal science" that cherishes through producing more and more of similar results and repeating the same ideas over and over again—and developmental science in its ambition of solving the problem of development cannot merely "contribute" to the "literature" (Valsiner, 2000c). The latter is not the collective maker of "scientific truth" but merely a heterogeneous conglomerate of different studies of different institutionalized social value markers (e.g., "peer-reviewed journal articles" being allotted prestige). Since the theoretical basis of what is labeled "developmental" in contemporary psychology is vague, "the literature" is of little consequence for solving basic problems of developmental science.

As this book demonstrates—the development of ideas of development is a multi-level dynamic process that intricately links the particular scientist, his or her immediate social setting of co-workers, and the wider realm of society that develops in its own ways, and within which science operates. The history of Heinz Werner's contributions may allow us to understand the intricate differentiation of ideas and empirical practices in the wider context of the demand structure of human history. The latter never ends—and neither will the contributions of major developmental thinkers of the past. In our movement towards the future we build on their experience. Scientific knowledge itself is an organismic whole that sieves out fads and fashions from basic contributions. Heinz Werner's legacy belongs to the latter.

ACKNOWLEDGMENTS

This chapter benefited from critical comments from René van der Veer, Nancy Budwig, Roger Bibace, and other colleagues.

REFERENCES

Allport, G. W. (1940). The psychologist's frame of reference. ***Psychological Bulletin, 37***, 1, 1–28.

Ash, M. G. (1995). ***Gestalt psychology in German culture, 1890–1967***. Cambridge: Cambridge University Press.

Baker. R. (1953). ***The acquisition of verbal concepts in schizophrenia***. Unpublished Ph.D. dissertation, Clark University.

Baldwin, J. M. (1906). ***Thought and things: A study of the development and meaning of thought, or genetic logic*** Vol. 1. ***Functional logic, or genetic theory of knowledge***. London: Swan Sonnenschein & Co.

Bibace, R., Laird, J., Noller, K., & Valsiner, J. (Eds) (2004). ***Science and medicine in dialogue***. Stamford, Ct.: Greenwood.

Bodansky [Franklin], M. (1956). ***An experimental and theoretical inquiry into the symbol-meaning relationship***. Unpublished M.A. thesis, Clark University.

Bodansky [Franklin], M. (1961). ***The representation of abstract concepts through the use of line patterns***. Unpublished Ph.D. dissertation, Clark University.

Boesch, E. E. (1998). ***Sehnsucht***. Bern: Hans Huber.

Branco, A. U., & Valsiner, J. (1997). Changing methodologies: A co-constructivist study of goal orientations in social interactions. ***Psychology and Developing Societies, 9***, 1, 35–64.

Brooks, M. O., & Phillips, L. (1958). The cognitive significance of Rorschach developmental scores. ***Journal of Personality, 26***, 2, 268–290.

Cairns, R. B. (1986). Phenomena lost. In J. Valsiner (Ed.), ***The individual subject and scientific psychology*** (pp. 97–111). New York: Plenum

Cairns, R. B. (1998). The making of developmental psychology In W. Damon & R. Lerner (Eds.), ***Handbook of child psychology***. 5th edition. Vol. 1. ***Theoretical models of human development*** (pp. 25–105). New York: Wiley.

Cairns, R. B., & Valsiner, J. (1984). Child psychology. ***Annual Review of Psychology, 35***, 553–577.

Cairns, R. B., Elder, G. E., & Costello, E. J. (Eds.) (1996). ***Developmental science***. New York: Cambridge University Press.

Cassirer, E. (1923). ***Philosophie der symbolischen Formen***. Vol. 1, ***Die Sprache***. Berlin: Bruno Cassirer Verlag.

Cassirer, E. (1953). ***Philosophy of symbolic forms***. vol. 1. New Haven, Ct: Yale University Press.

Chapman, M. (1988). ***Constructive evolution***. New York: Cambridge University Press.

Danziger, K. (1990). ***Constructing the subject***. Cambridge: Cambridge University Press.

Dolby, R. G. A. (1977). The transmission of two new scientific disciplines from Europe to North America in the late 19th century. ***Annals of Science, 34***, 287–310.

Gelb, A., & Goldstein, K. (1920). ***Psychologischen Analysen hirnpathologischer Fälle***. Leipzig: J. A. Barth.

Gigerenzer, G., Swijtink, Z., Porter, T., Daston, L., Beatty, J. & Krüger, L. (1989). ***The empire of chance***. Cambridge: Cambridge University Press.

Goldman, A. E. (1953). Studies in vicariousness: degree of motor activity and the autokinetic phenomenon. **American Journal of Psychology, 66**, 4, 613–617.

Goldstein, K. (1960). Sensoritonic theory and the concept of self-realization. In B. Kaplan & S. Wapner (Eds.), ***Perspectives in psychological theory: Essays in honor of Heinz Werner*** (pp. 115–123). New York: International Universities Press.

Gottlieb, G. (1997). ***Synthesizing nature/nurture***. Mahwah, N.J.: Erlbaum.

Gottlieb, G. (2003). Probabilistic epigenesis of development. In J. Valsiner & K. J. Connolly (Eds.), ***Handbook of developmental psychology*** (pp. 3–17). London: Sage.

Gottmann, J. M., Murray, J. D., Swanson, C. C., Tyson, R., & Swanson, K. (2002). ***The mathematics of marriage: Dynamic nonlinear models***. Cambridge, Ma.: MIT Press.

Hermans, H. (2001). The dialogical self: Toward a theory of personal and cultural Positioning. ***Culture and Psychology, 7***, 3, 243–281.

Hermans, H. J. (Ed) (2002). Special Issue on dialogical self. ***Theory & Psychology, 12***, 2, 147–280.

Kaden, S. E. (1955). Studies in physiognomic perception: II. Effect of directional dynamics of pictured objects and of words on the position of the apparent horizon. ***Journal of Psychology, 39***, 61–70.

Kaplan, E. (1952). ***An experimental study on inner speech as contrasted with external speech***. Unpublished M.A., thesis, Chark University.

Knorr Cetina, K. (1999). ***Epistemic cultures: how the sciences make knowledge***. Cambridge, Ma.: Harvard University Press.

Krueger, F. (1915). Über Entwicklungspsychologie. ***Arbeiten zur Entwicklungspsychologie, 1***, 1 (pp. 1–232). Leipzig: Wilhelm Engelmann.

Krus, D. M., Werner, H., & Wapner, S. (1953). Studies in vicariousness: motor activity and perceived movement. ***American Journal of Psychology, 66***, 4, 603–608.

Laird, J. (2004). A microgenetic developmental perspective on statistics and measurement. In R. Bibace, J. Laird, K. Noller, & J. Valsiner (Eds). ***Science and medicine in dialogue***. Stamford, Ct.: Greenwood.

Langer, J. (1970). Werner's comparative organismic theory. In W. Kessen (Ed.), ***Handbook of Child Psychology***. 4th Ed. Vol. 1. ***History, theory, and methods***. (pp. 733–771). New York: Wiley.

Langer, J. , Wapner, S., & Werner, H. (1961). The effect of danger upon the experience of time. ***American Journal of Psychology, 74***, 94–97.

Leontiev, A. N. (1932). The development of voluntary attention in the child. ***Journal of Genetic Psychology, 40***, 52–81.

Luria, A. R. (1928). The problem of cultural development of the child I. ***Journal of Genetic Psychology, 35***, 347–353.

Luria, A. R. (1929). ***Materialy k genezu pis'ma u rebenka***. Moscow: Psychological Laboratory of the Academy of Communist Education.

Löwy, I. (1992). The strength of loose concepts—boundary concepts, federative experimental strategies and disciplinary growth: the case of immunology. ***History of Science, 30***, 90, part 4, 376–396.

Maslow, A. H. (1948). Cognition of the particular and of the generic. ***Psychological Review, 55***, 1, 22–40.

Mead, G. H. (1912). The mechanism of social consciousness. ***Journal of Philosophy, 9***, 401–406.

Mead, G. H. (1913). The social self. ***Journal of Philosophy, 10***, 374–380.

Mead, G. H. (2001). The philosophies of Royce, James and Dewey in their American settings. ***Culture & Psychology, 7***, 1, 49–64 [originally published in 1930].

Mey, G. (2000). Qualitative Research and the Analysis of Processes. Considerations Towards a "Qualitative Developmental Psychology" [35 paragraphs]. ***Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*** [On-line Journal], 1(1). Available at: *http://www.qualitative-research.net/fqs-texte/1-00/1-00mey-e.htm*.

Mey, G. (2003). Qualitative Forschung: Überlegungen zur Forschungsprogrammatik und Vorschläge zur Forschungspraxis im Themenfeld der Frühen Kindheit. In H. Keller (Hrsg.), ***Handbuch der Kleinkindforschung*** (3rd. revised and expanded edition, pp. 715–756). Bern: Huber.

Miller, A. (1961). ***An experimental study of the role of sensorimotor activity in the maintenance of verbal meaning of action words***. Unpublished Ph.D. dissertation, Clark University.

Miller, R. (1997). Martha Muchow's concept of lifespace. In W. Bringman, H. Lück, R. Miller, R., & C. Early. (Eds). ***A pictorial history of psychology***. (pp. 337–341). Carol Stream, Ill: Quintessence Publishing Co.

Morant, R. (1966). Concluding remarks. In S. Wapner & B. Kaplan (Eds), ***Heinz Werner 1890–1964: Papers in memoriam*** (p. 77). Worcester, Ma.: Clark University Press.

Nesselroade, J., & Molenaar, P. (2003). Quantitative models for developmental processes. In J. Valsiner & K. J. Connolly (Eds.), ***Handbook of developmental psychology*** (pp. 622–639). London: Sage.

Rapaport, D. (1941). Critical reviews of recent books: Werner, H., Comparative psychology of mental development. ***Journal of Genetic Psychology, 58–59***, 429–434.

Simão, L. M. (2002). Alteridade no dialogo e construção de conhecimento. Paper presented at the First Brazilian Congress of Psychology, São Paulo, September.

Smith, J., & Dunsworth, F. (2003). Qualitative methodology. In J. Valsiner & K. J. Connolly (Eds.), ***Handbook of developmental psychology*** (pp. 603–621). London: Sage.

Stern, L. W. (1906). ***Person und Sache: System der philosophischen Weltanscauung***. Leipzig: J.A. Barth. van der Veer, R. & Valsiner, J. (1991). ***Understanding Vygotsky***. Oxford: Blackwell.

Van Geert, P. (1994). ***Dynamic systems of development***. Hemel Hempstead: Harvester/Wheatsheaf.

Van Geert, P. (2003). Dynamic systems approaches and modeling of developmental processes. In J. Valsiner & K. J. Connolly (Eds), ***Handbook of developmental psychology*** (pp. 640–672). London: Sage.

Valsiner, J. (Ed.) (1986). ***The role of individual subject in scientific psychology***. New York: Plenum.

Valsiner, J. (1988). ***Developmental psychology in the Soviet Union***. Brighton: Harvester Press.

Valsiner, J. (1997). ***Culture and the development of children's action***. 2nd. Ed. New York: Wiley.

Valsiner, J. (1998). The development of the concept of development: Historical and epistemological perspectives. In W. Damon & R. Lerner (Eds.), ***Handbook of child psychology***. 5th edition. Vol. 1. ***Theoretical models of human development*** (pp. 189–232). New York: Wiley.

Valsiner, J. (2000a). Data as representations: contextualizing qualitative and quantitative research strategies. ***Social Science Information, 39***, 1, 99–113.

Valsiner, J. (2000b). ***Culture and human development***. London: Sage.

Valsiner, J. (2000c). Entre a "Democracia da Literatura" e a paixao pela compreensão: Entendendo a dinâmica do desenvolvimento. ***Psicologia: Reflexão e critica, 13***, 2, 319–325.

Valsiner, J. (2001). Constructive curiosity of the human mind: Participating in Piaget. Introduction to the Transaction Edition of Jean Piaget's ***The child's conception of physical causality*** (pp. ix–xxii). New Brunswick, N.J.: Transaction Publishers.

Valsiner, J., & Connolly, K. J. (2003). The nature of development: The continuing dialogue of processes and outcomes. In J. Valsiner & K. J. Connolly (Eds), ***Handbook of developmental psychology*** (pp. ix–xviii). London: Sage.

Valsiner, J., & van der Veer, R. (2000). **The social mind: Construction of the idea.** New York: Cambridge University Press.

Vidal, F. (1994). ***Piaget before Piaget***. Cambridge, Ma.: Harvard University Press.

Vigotsky, L. S. (1929). The problem of the cultural development of the child. ***Journal of Genetic Psychology, 36***, 415–434.

Von Baer, K. E. (1828). ***Über Entwicklungsgeschichte der Thiere: Beobactung und reflexion***. Königsberg: Bornträger.

Wapner, S., & Werner, H. (1957). ***Perceptual development: An investigation within the framework of sensory-tonic field theory***. Worcester, Ma: Clark University Press.

Wapner, S., Werner, H., & Comalli, P. (1956). Space localization under the conditions of danger. ***Journal of Psychology, 41***, 335–346.

Wapner, S., Cirillo, L., & Baker, A. H. (1969). Sensory-tonic theory: toward a reformulation. ***Archivio di psicologia, neurologia e psichatria, 30***, 6, 493–512.

Werner, H. (1912). Skizze zu einer Begriffstafel auf genetischer Grundlage. ***Archiv für systematische Philosiphie, 18***, 45–62.

Werner, H. (1917). Die melodische Erfindung im frühen Kindesalter. ***Kaiserliche Akademie der Wissenschaften in Wien. Philosophisch-historische Klasse. Sitzungsberichte*** **182**, Band 4.

Werner, H. (1919). ***Die Ursprünge der Metapher***. Leipzig: Engelmann (Arbeiten zur Entwicklungspsychologie, vol. 3).

Werner, H. (1924). ***Die Ursprünge der Lyrik.*** München: Ernst Reinhardt.

Werner, H. (1926). ***Einführung in die Entwicklungspsychologie***. Leipzig: Johann Ambrosius Barth.

Werner, H. (1927). Ueber physiognomische Wahrnehmungsweisen und ihre experimentelle Prüfung. ***Proceedings and papers of the 8th International Conference of Psychology*** (pp. 443–446). Groningen: P. Noordhoff.

Werner, H. (1929). Über die Sprachphysiognomik als einer neuen Methode der vergleichenden Sprachbetrachtung. ***Zeitschrift für Psychologie, 109***, 337–363.

Werner, H. (1930). Untersuchungen über Empfindung und Empfinden. ***Zeitschrift für Psychologie, 117***, 230–254.

Werner, H. (1933). ***Einführung in die Entwicklungspsychologie***. 2nd. Ed. Leipzig: Johann Ambrosius Barth.

Werner, H. (1936). ***Compendio de psicología evolutiva***. Barcelona: Salvat Editores. [Spanish translation of the 2nd German edition]

Werner, H. (1937). Process and achievement: a basic problem of education and developmental psychology. ***Harvard Educational Review, 7***, 3, 353–368.

Werner, H. (1938). William Stern's personalistics and psychology of personality. ***Character & Personality, 7***, 109–125.

Werner, H. (1940). ***Comparative psychology of mental development***. New York: Harper & Brothers.

Werner, H. (1944). Development of visuo-motor performance on the marble-board test in mentally retarded children. ***Journal of Genetic Psychology, 64***, 269–279.

Werner, H. (1945a). Perceptual behavior of brain-injured, mentally defective children: an experimental study by means of the Rorschach technique. ***Genetic Psychology Monographs, 31***, 51–110.

Werner, H. (1945b). Motion and motion perception: a study on vicarious functioning. ***Journal of Psychology, 19***, 317–327.

Werner, H. (1946a). The concept of rigidity. ***Psychological Review, 53***, 43–52.

Werner, H. (1946b). Abnormal and subnormal rigidity. ***Journal of abnormal and social Psychology, 41***, 15–24.

Werner, H. (1948). ***Comparative psychology of mental development***. 2nd. ed. Chicago: Follett Publishing Co.

Werner, H. (1953a). Child psychology and general psychology. Paper presented at the APA meeting (symposium: *Contribution of child psychology to psychological theory*). Cleveland, Oh., September.

Werner, H. (1953b). ***Einführung in die Entwicklungspsychologie***. 3rd ed. München: Johann Ambrosius Barth.

Werner, H. (1954). Change of meaning: A study of semantic processes through the experimental method. ***Journal of General Psychology, 50***, 181–208.

Werner, H. (1955). A psychological analysis of expressive language. In H. Werner (Ed.), ***On expressive language*** (pp. 11–18). Worcester, Ma.: Clark University Press.

Werner, H. (1956). Microgenesis and aphasia. ***Journal of Abnormal & Social Psychology, 52***, 347–353.

Werner, H. (1957a). The concept of development from a comparative and organismic point of view. In D. B. Harris (Ed.), ***The concept of development*** (pp. 125–147). Minneapolis: University of Minnesota Press.

Werner, H. (1957b). ***Comparative psychology of mental development***. 3rd. ed. New York: International Universities Press.

Werner, H. (1959). ***Einführung in die Entwicklungspsychologie***. 4th ed. München: Johann Ambrosius Barth.

Werner, H. (1962). Significance of general experimental psychology for the understanding of abnormal behavior and its correction or prevention. In ***The relationship between rehabilitation and psychology*** (pp. 1–19). Washington, D.C.: Office of Vocational Rehabilitation.

Werner, H., & Kaplan, B. (1956). The developmental approach to cognition: its relevance to the psychological interpretation of anthropological and ethnolinguistic data. ***American Anthropologist, 58***, 866–880.

Werner, H., & Kaplan, B. (1963). ***Symbol formation: An organismic-developmental approach to language and the expression of thought***. New York: Wiley.

Werner, H., & Kaplan, E. (1952). The acquisition of word meanings: A developmental study. ***Monographs of the Society for Researchin Child Development, 15*** (Serial 51), 1.

Werner, H., & Kaplan, E. (1954). Word context test (letter to the editor). ***British Journal of Psychology, 45***, 134–136.

Werner, H., & Phillips, L. (1955). A proposed research program in mental health: a theoretical and applied study of human behavior from a developmental point of view. Worcester, Ma.: Clark University (unpublished paper).

Werner, H., & Strauss, A. (1939a). Problems and methods of functional analysis in mentally deficient children. ***Journal of abnormal and Social Psychology, 34***, 1, 37–62,

Werner, H., & Strauss, A. (1939b). Types of visuo-spatial activity in their relation to low and high performance ages. ***Proceedings from the American Association on Mental Deficency, 44***, 163–168.

Werner, H., & Wapner, S. (1949). Sensory-tonic field theory of perception. ***Journal of Personality, 18***, 1, 88–107.

Werner, H., & Wapner, S. (1956). Sensory-tonic field theory of perception: basic concepts and experiments. ***Rivista di Psicologia, 50***, 4, 315–337.

Wertheimer, M. (1985). The evolution of the concept of development in the history of psychology. In G. Eckardt, W.G. Bringman & L. Sprung (Eds.), ***Contributions to a history of developmental psychology*** (pp. 13–25). Berlin: Mouton.

INDEX

"Acquisition of Word Meanings: A Developmental Study, The" (Werner and Kaplan), 185
Adler, Alfred, 203
Adoption, and person-in-environment system, 292
Aesthetic concepts, 33, 82
Aesthetic phenomena
  biological-psychological approach, 39
  developmental-psychological approach to, 39
  lyric, origins of, 42–45
  in primitive cultures, 42–43
  Werner's studies of, 26, 42–45
  See also Art; Music
Aftereffects, figural, 277
AIDS
  safe-sex practices study, 301–302
  universal precautions, physician compliance, 245–247
Allport, Gordon, 242–243, 250
Alper, Thelma, 128
Ames, Aldelbert, 202
Ames' effect, 202
Analogy, orchestration as, 252–255
Anschütz, Gernard, 56
Apparent motion
  and brain damage, 267
  meaning of, 267
Apperceived concepts, 33–34
Apperception, 35–36
Appurtenance, axiom of, 262–264, 268–270, 272–275, 277, 279
Arithmetic cognitions. *See* Logico-mathematical cognition
Arnold, Matthew, 137
Art
  developmental-psychological approach, 39
  form and function in, 45
  See also Aestheic phenomena; Creativity; Music
Assimilation, Werner on, 67, 97–98
Attention, and consciousness, 265, 270–271
Attractors, 5
Australian aborigines, Werner on, 79
Autism
  and adaptation to change, 354–356
  behavioral view of, 348
  body loss in, 361–362
  edge experiences in, 361–362
  expanding systems, techniques for, 366–371
  and extension principle, 370–371
  and inclusion principle, 360–361, 363–364
  and interactive capacity, 353–354
  and magic, 347
  naming, 374–375
  neuro-anatomic components, 348
  normal reactions to, 347
  parent-child bonding, 357, 370–371
  progress in, case example, 383–387
  psychoanalytic view of, 347–348
  reading/writing, 377–383
  and rituals/sequence, 365–366
  sign-stage, 351–352, 357–359
  social competence, increase in, 386–387
  Symbol Accentuation Reading Program, 347, 381–383
  symbolic-sign stage, 352–353, 374–375
  system formation, 359–360
  Umwelt Assessment of, 353–359

Autism (*cont.*)
and Werner's theory, 345–349
word meaning, teaching technique, 362–364
Autokinetic motion, study of, 164

Bacon, Francis, 135
Baer, Karl Ernst von, 4, 99–100
Baker, Robert, 128, 181, 185, 187, 193, 197, 198
remembrance of Werner, 221–223
Baldwin, Alfred, 230
Baldwin, James Mark, 6, 309, 391, 411
Bamberg, Michael, 130
Barker, Roger, 182–183
Barton, Mel, 130
Basic Questions of Intensity Psychology (Habilitationsthesis: grandfragen der intensitätspsychologie) (Werner), 20
Basic Questions of the Physiognomics of Language (Grandfragen der sprachphysiognomik) (Werner), 20
content of, 46–47
Basking in Burke (Kaplan), 144
Bateman, Jack, 130
Bauplan (mental structure), 79
Beck, Robert, 187
Begriffsbildner (constructor of concept), 31–32
Behavioral model, of autism, 348
Bell, John E., 128, 183, 190–191
Bell's law, 35
Benary cross, 275–276
Benary, Wilhelm, 57–58
Benedict, Ruth, 134
Bernstein, Leonard, 252
Bettelheim, Bruno, 348
Bhatia, Sunil, interview with Bernie Kaplan, 121–152
Bibace, Roger, 130–132, 185, 190, 197
remembrance of Werner, 235–238
Biogenetic law, 403
Biological-evolutionary approach, Mach on, 29
Biological-psychological approach
core concept of, 45
limitations of, 39
Bipolar disorder, delusions in, 334
Black persons, Werner on, 79–80
Bleuler, Eugene, 249
Blind spot
Werner's studies of, 35, 60–61
Werner's writing on, 19, 35
Bliss, Monte, 223
Boas, Franz, 134, 138
Bodansky, Margery, 130

Body perception, 161–162
and age, 161
and autism, 361–362
and psychopathology, 161
and psychotropic drugs, 161–162
and symbolic-sign stage, 372–373
Body position, and space perception, 160, 165
Bonding, autistic children, 357, 370–371
Boston Qualitative Scoring System (BQSS), 197
Brain
and autism, 348
cortical tonic expressivity axiom, 262, 266–268
learning, neurophysiological principle, 34, 94–95
maturation, human versus primate, 309
sensory deprivation studies, 267–268
sensory-tonic theory, 265–267
Braine, Martin, 132
Brent, Sandor, 130
remembrance of Werner, 213–219
Brightness, phenomenal theorems of, 272–273
Brooklyn College, Werner at, 20, 125, 183, 209, 222
Brown, Robert, 183
Bruell, Jan, 128, 185
Budwig, Nancy, 130
Bühler, Karl
areas of study, 9, 58
and Werner, 19, 39, 58–59, 62, 392
Bund für Schulreform, 57
Bunsen-Roscoe Law, 232
Burke, Kenneth, 143–147
Butters, Nelson, 130

California Verbal Learning Task (CVLT), 197
Capuchins
logico-mathematical cognition, 311–312, 316
physical cognition, 315, 317
Carini, Louis, 261
Carmichael, Leonard, 201
Carter, William, 187
Case studies, longitudinal research, 296–297
Cassirer, Ernst
and Gestalt concepts, 262
influence on Werner, 20, 26, 46, 55, 65, 69, 111, 115, 150, 395, 412–413
on signs and symbols, 387–388
writings of, 126, 132, 142
Category of the Person, The (Carithers, Collins and Lukes), 141
Chimpanzees
logico-mathematical cognition, 312–314, 316
physical development, 317

Chomsky, Noam, 131
Church, Joe, 128
Circular reactions, 90
Cirillo, Leonard, 109, 130, 186–187, 194–195, 216
  remembrance of Werner, 229–234
Clark University, 183–238
  APA issues with, 188
  Baker's remembrance, 221–223
  Bibace's remembrance, 235–238
  Brent's remembrance, 213–219
  Cirillo's remembrance, 229–234
  colloquia at, 216–218, 228, 235–236
  departmental conflicts, 190–193
  departmental research areas, 186–189
  German language requirement, 194, 236–237
  Hurwitz's remembrance, 207–212
  interdisciplinary seminars, 187
  Jefferson leadership, 181–183
  Kaplan's remembrance, 121–152
  Miller's remembrance, 225–228
  Mulholland's remembrance, 201–205
  pre-Werner period, 14–15, 181–184, 396–398
  psychology department, growth of, 183–193
  Werner's collaborators, 185–186, 226
  Werner's impact on colleagues/students, 181, 193–199, 200–205, 211–212, 217–219, 225–228, 235–238
  Werner's legacy, 2, 184, 196–199
  Werner's productivity at, 185–186, 230–234, 401
  Werner's teaching style, 193–196, 209–210, 216, 226–231, 237–238
Classification
  autistic child, 383–384
  chimpanzees, 312
  human infants, 310–311
  monkeys, 311–312
Clock Drawing, 197
Coexistence concept of development (CCD), 239–257
  intra-individual variability, 239–243, 255
  and levels of development, 241–243
  magical beliefs, 243–244, 247
  orchestration as integration, 252–255
  and other disciplines, 251–252
  physician behavior example, 245–246
Cognition, biological-evolutionary approach, 29
"Cognition of magnitude: A comparative study of normals and schizophrenics, The" (Werner and Bibace), 185
Cognitive development, 307–319
  humans versus primates, 310–318
  of logico-mathematical cognition, 307, 310–318
  onset and offset age, 310
  phylogenetic roots of, 308–310
  of physical cognition, 307, 314–315
  plasticity of, 309
  recursive development, 316–317
  study method, 307–308
Cognitive-developmental systems theory
  and autistic children. *See* Autism
  compensatory actions in, 367–368
  extension principle, 370–371
  inclusion principle, 360–364, 370
  sign stage, 350–351
  symbolic-sign stage, 350–353
  symbol stage, 350
Cognitive sets, 265
Cohn, Jonas, 57, 64, 71
Coinesthetic perception, 70
Colonial Institute, becomes Hamburg University, 64–65
Color
  phenomenal theorems of, 272–273
  sensorium commune, 48
Comalli, Peter, 186
Comparative Psychology of Mental Development (Einführung in die entwicklungs-psychologie) (Werner), 98–101
  Allport's forward, 242–243, 250
  basis for book, 55, 62, 98–99, 405
  coexistence concept of development (CCD), 239–257
  compared to German edition, 405–407
  content of, 99–101
  critique of, 101, 414–415
  editions of, 20–21
  historical era, effects of, 250–251
Compensatory actions, 367–368
Compound words, cross-cultural view, 82
Concepts
  concept-pairs, 99, 406–407
  Mach on (biological-evolutionary approach), 29
  Stöhlr on (constructors approach), 31–32
  and symbolic functioning, 346
  Vygotsky on, 35–36
  Werner's classification of, 16, 33–34, 61, 81–82
  Werner's theory of, 33–36, 61–62

Connotation of words, 83–84
Consciousness
  and attention, 265, 270–271
  defined, 265, 271
Constellation, principle of, 69
Contingent relations, physical cognition, 307
Coombs, Clyde, 215
Cortical tonic expressivity, axiom of, 262, 266–268, 269, 271–279
Creative synthesis, Werner on, 10
Creativity
  developmental-psychological approach to, 39
  Werner's studies of, 39, 61
  See also Aesthetic phenomena
Creuzer, H., 97–98
Critical transitions. *See* Person-in-environment transitions
Crockett, Hob, 129
Cross-cultural comparisons
  of concept of objects, 61
  physiognomic language, 83
  preference for concepts, 82
  Werner's emphasis on, 61, 66–67, 69–70, 79–81
  Werner's prejudice in, 79–81
Cross-sectional research, person-in-environment transitions, 295–296
Culture, definitions of, 137–138

Damon, Bill, 129
Darwin, Charles, 140
Debriefing technique, longitudinal research, 297
Delusions
  developmental view, 331
  of persecution, 334
Dembo, Tamara, 128, 186–187, 196, 222, 233
Demick, Jack, 130, 285
Depression
  features of, 333
  and mania, 334
  and psychopathology, 333–334
Development: Psychological and Otherwise (Kaplan), 136
Development
  relationship to origin, 39
  separation from chronology, 207–208, 241–242
Developmental concepts, 61
Developmental experiments, goals of, 38
Developmental science
  areas for investigation in, 416–419
  features of, 4–8
  and Piaget, 4, 7
  and Vygotsky, 4, 8, 98, 101, 391
  and Werner, 1–2, 391–414
Developmental theories
  biological-psychological approach, 39, 45
  cognitive-developmental theory and autism, 348–388
  field theories, 6
  genetic-comparative method, 38
  hierarchical ordering approach, 6
  Krueger's, 26, 36–38, 403
  node relations approach, 5–6
  organismic-developmental theory, 141–142
  positive postulate approach, 6
  probalistic epigenesis, 418
  scientific approach, 38
  Werner's. *See* Werner's developmental theory
"Development of Word Meaning through Verbal Context: An Experimental Study, The" (Werner and Kaplan), 185
Diacritical perception, 70
Diagnostic Psychological Testing (Shafer), 211
Differential Psychology in Its Methodological Foundations (Stern), 59
Differentiation
  and developmental processes, 10, 157
  in orthogenetic principle, 99–100
Dissimilation, Werner on, 67, 97–98
Distance, phenomenal theorems of, 272
Distancing
  features of, 12–13
  and mastery, 100
  and symbol formation, 45, 411–412
Double stimulation method, 411
Dowling, Bob, 216
Dreams
  and idiosyncratic concepts, 35
  images as syncretic, 99
Dynamic concepts, 33–34, 61, 81–82

Ebbinghaus, Hermann
  areas of study, 63
  and Stern, 57, 59, 63–64
Economy, biological-evolutionary approach, 29
Edge experiences, and autism, 361–362
Educational psychological laboratory, under Meumann, 56–58
Egocentricity, meaning of, 170
Einführung in die Entwicklungspsychologie (Werner)
  American version. *See Comparative Psychology of Mental Development* (Werner)
  editions of, 20–21

Elements of Folk Psychology: Outlines of a Psychological History of the Development of Mankind (Wundt), 37
Eliot, T.S., 254
Eller-Miller, Eileen, 198
Emmanuel Sarris, 20
Emotions
  feeling concepts, 33
  objectification and lyric, 43–44
  and perception, 69–70
Energy, blocked, 94
  Entwicklungegeshichte der Thiere (von Baer), 4
Epistemological questions, metaphors problem, 30
Erle, Dick, 130
Essay on Man, An (Cassirer), 126
Ethnography, 91–94
  origin of lyrics, 93–94
  origin of metaphor, 92–93
Ethnopsychology, 138
Exchange and correspondence
  chimpanzees, 313–314
  human infants, 312–313
  monkeys, 313
Exner, Sigmund, 58–60
Experience, and perception, 228
Extemporaneous songs, 43
Extension principle, 370–371
  normal features, 370
  parent/child bonding and autism, 370–371

Factor analysis, 7–8
Feeling concepts, 33
Festschrift, Werner, 127
Field theories
  issues in, 6
  Werner on, 9
Figures, organization, phenomenal theorems of, 275–277
Flattery, and metaphor, 52
Flavell, John, 128
Forgetting, neurophysiological view, 95
Formal parallels concept, 403–405
Form and function, in art, 45
Forms of organization, 241, 248–249
Frank, Semyon, 83
French language, 83
Freud, Sigmund, 28, 126–127, 139, 190, 203, 211
  See also Psychoanalytic model
Freund, Edith, 125

Friendships
  categories of, 293–294
  and person-in-environment system, 293–294
  social support functions of, 294
From Ritual to Repertoire (Miller and Miller), 195, 198, 227
Functional equilibrium, and maturity, 346
Functional equivalence, 266
Functional shift, 349

Ganzheitspsychologie, 11–12
Genetic-comparative method, 38
Genetic Dramatism (G-D), 143–146
Geometrical-optical fusion, Werner on, 35, 67
German language, 83
Germany
  Nazi era, 13–14, 70–71, 204–205
  orientation of psychology in, 186, 394–395, 397–398
Gervai, Erica. *See* Werner, Erica (wife)
Gervai, Jo. *See* Werner, Jo (wife)
Gesell, Arnold, 4
Gestalt concepts
  appurtenance, 262–264
  influence on Werner, 46–47, 60, 62–63, 66–68, 96, 261–262, 402
  laws of organization, 262–264
  phenomenal psychology, 261–282
  psychophysics, 46–47, 60, 98
  and rhythm studies, 67, 87
  Werner's studies related to, 67, 87, 97–98
Gestalt psychology, founders of, 60, 261–262
Gilligan, Carol, 133
Glick, Joseph, 130
Glick, Marion, 323–324, 331–332, 336–339
Global-articulate concept pair, 99
Goethe, Johann Wolfgang, influence on Werner, 8–9, 42, 76–78, 139, 234, 402
Gogel, Walter C., 262, 269–274, 277
Goldschmidt, Richard, 56
Goldstein, Kurt, 12, 211, 397, 408–409
Gollin, Gene, 128
Gorillas, physical cognition, 314–315
Grammar, physiognomic, 85
Great Chain of Being, The (Lovejoy), 135, 139, 141
Growth of the Mind (Koffka), 230
Gründerzeit, aestheticism during, 27–28
Gwinn, Gordon, 128, 183–184, 188

Habilitation thesis
  of Stern, 59
  of Werner, 20, 55

Haeckel, Ernst, 78, 403
Halle, Morris, 131
Hall, G. Stanley, 2, 4, 78
  at Clark, 182–183
Hallucinations, developmental view, 331
Hamburger, Viktor, 215
Hamburg Teachers' Association, 57, 64
Hamburg years (1917–1933)
  at Psychological Laboratory, 20, 55–56, 58–59, 64–65
  at University of Hamburg, 20, 55, 65–71
  Werner accomplishments upon arrival, 58–64, 399
  Werner during, 65–71, 400
Hamilton, Sue, 130
Hardy, Tony, 130
Harrell, Richard, 187
Harris, Judith Rick, 251
Harris, Marvin, 137
Health, and person-in-environment transitions, 288, 290–291
Hegel, Georg Wilhelm, influence on Werner, 76–78, 233
Heider, Fritz, 23, 397, 408
Herder, Johann Gottfried, influence on Werner, 48, 76–78, 142
Heterochrony, primate cognitive development, 318
Hierarchical ordering. *See* Orthogenetic principle
Historical eras, and scientific paradigms, 250–251
Hofmannsthal, Hugo von, 28
Holistic approach
  and Leipzig school, 10, 36, 97, 398
  of Werner, 69–70
Hornstein, Gail, 130
Hull, Clark, 128
Hunter, Walter, 182
Hurwitz, Irving, remembrance of Werner, 207–212
Hypothetico-deductive theory, 232

Idiosyncratic concepts, 35
Illusions
  Muller-Lyer, 168, 209–210, 278
  phenomenal theorems of, 277–278
  Poggendorff, 278
  Ponzo, 277
Imitation, and genesis of concepts, 33, 82
Inclusion principle
  normal features, 360, 370
  word meaning and autism, 360–361, 363–364
Indefinite-definite concept pairs, 99
Individuality, Werner on, 10
Individuation, 233
Infants
  logico-mathematical cognition, 310–313
  object permanence, 314–315
  physical cognition, 314–315
Inhibition, and taboo, 41–42
Inkblot tests, 113–117
  features of, 109–110
  and metaphors, 115–116
  as perceptual method, 113–114
  representational factors, 115
  validity of, 116
Institute for the Study of Adolescence, 64
Integration, as orchestration, 252–255
Intensity, psychology of, 95–96
Intra-individual variability, 239–243, 255
"Introduction to Bibliography and Addenda" (Werner and Kaplan), 185
Introduction to Developmental Psychology (Einführung in die entwicklungspsychologie) (Werner), 20–21, 55
  content of, 66, 68
  and later writing, 55, 62
Introductory Lectures into Experimental Education (Meumann), 64
Intuition, 35
Ipsen, Günter, 11
Irony, and metaphor, 52

Jakobson, Roman, 39, 124, 397
James, William, 203
Jefferson, Howard Bonar, 181–183
Jodl, Friedrich, 30
Jones, Vernon, 127, 182, 183–184
Jordan, Ed, 226
Josephs, Ingrid E., interview with Bernie Kaplan, 121–152
Judge Baker Guidance Center, 184
Jung, Karl, 203, 233

Kabori, Nanrei S., 213–214
Kanner, Leo, 347
Kant, Emmanuel, neo-Kantian philosophy, 25, 55, 65, 111, 229
Kaplan Baycrest Neurocognitive Assessment, 197
Kaplan, Bernard, 109, 181, 187, 192, 194, 197, 214, 222, 324
  collaboration with Werner, 12, 116, 130, 133–134, 226, 231, 234
  interview with, 121–152

Kaplan, Edith, 131, 181, 185, 192, 197, 222
Kehr, Theodore, 56–57
Kelner, Hal, 218–219
Kempler, Bernhard, 216, 230
Kindersprache (Stern and Stern), 31
Klein, George, 147
Klimt, Gustav, 27
Kluckhohn, Clyde, 128
Knowledge for What? (Lynd), 151
Koch, Sigmund, 183
Koffka, Kurt, and appurtenance concept, 262–264
Kohlberg, Lawrence, 132–133
Kraus, Karl, 28
Kreppner, Kurt, 55
Kris, Ernst, 134
Krueger, Felix
  developmental theory of, 26, 36–38, 403
  Leipzig school of holistic psychology, 10, 36, 97, 398
Krus, Donald, 185
Külpe, Oswald
  areas of study, 58, 63
  and Werner, 19, 58–59, 62, 63, 392
Kymographion, 68

Lagercrantz, Eliel, 97
Laird, Jim, 130
Lamarck, Jean-Baptiste, 4
Lane, Jennifer M., 181
Langer, Jonas, 307, 407
Langer, Susanne, 262
Language
  development and thought, 31
  physiognomic. *See* Physionomic language
  primate learning of, 211
Language and Cognitive Development Center (LCDC), 198, 227
Lavine, Thelma, 125
Lazarus, Moritz, 4
Lazarus, Richard, 128, 190–192
Learning, neurophysiological principles of, 34, 94–95
Leipzig school of holistic psychology, 10, 36, 97, 398
Leventhal, Ted, 225
Levine, Jack, 323
Lewin, Kurt, 9, 100, 124, 233, 395
Life span, critical transitions across. *See* Person-in-environment transitions
Linear schematization, 411–412
Linsley, Ogden, 218
Lipton, Herb, 250
Logic, Stöhr on, 31
Logic of the Humanities, The (Cassirer), 142
Logico-mathematical cognition, 310–318
  capuchins, 311–312, 316
  chimpanzees, 312–314, 316
  defined, 307
  human infants, 310–313
  macaques, 312–314, 316
  monkeys, 311–313
Longitudinal research
  case studies, 296–297
  debriefing technique, 297
  person-in-environment transitions, 296–299
  sketch maps, 298
  systems-type analysis, 298–299
Loos, Adolf, 28
Lorenz, Konrad, 128
Lovaas, Ivar, 348
Lovejoy, A.O., 135, 139, 141
Löwenfeld, Viktor, 397
Lynd, Robert, 151
Lyric
  critique of studies, 93–94
  and developmental theory, 45
  elements of form, 44
  extemporaneous songs, 43
  and objectification of feelings, 43–44
  and poetry, 43–45
  primitive, 43–44
  and rhythm, 44–45
  Werner's writing on, 20, 42–45, 93

Macaques
  logico-mathematical cognition, 312, 316
  physical cognition, 314–315, 317
Mach, Ernst
  on blind spot, 35
  as mentor, 26, 28–30, 229
  theories of, 29–30, 36
Magic
  and autistic children, 347
  continuity magic, 347
  critique of studies, 91
  magical thinking studies, 90–91
  modern personal practices, 243–244
  positive effects of, 247
  and primitive lyric, 43–44
  taboo and metaphor, 40–42, 92–93
Magnitude, schizophrenic versus normal cognition, 248–249
Magovcevic, Mariola, 181

Mahl, George, 128
Maier, Norman, 131
Mania
  and delusions, 334
  and depression, 334
Marcuse, Herbert, 233
Mathematics
  mental automatization of, 30–31
  See also Logico-mathematical cognition
Mature functioning, elements of, 346
Mauthner, Fritz, 28
McFarland, Joseph, 130, 185, 230
McKeachie, Bill, 214
McNeil, Ogretta Vaughn, 130, 193–194
Mead, George Herbert, 129, 417
Mehrabian, Al, 130
Melodies
  musical development, 89–90, 402
  perception studies, 87
Memory, neurophysiological principles of, 34, 94–95
Mental retardation
  and psychopathology, 339–340
  and social competence, 339–340
Metamorphoses (Goethe), 4, 139
Metaphors
  critique of studies, 93
  definitions of metaphor, 40, 92, 115–116
  and developmental theory, 45
  and epistemological problems, 30
  and inkblot responses, 115–116
  object metaphors, 92
  perspective by incongruity concept, 145
  and *pneumas*, 40–41, 92
  primitive cultures, shift of motive, 40
  pseudo-metaphors, 40
  and self-protection, 41–42
  and taboo, 40–42
  Werner's writing on, 39–42, 45, 91
Meter, and lyric, 44
Meumann, Ernst
  areas of study, 63–64
  educational psychological laboratory of, 56–58, 64
Meumann, Meta, 57
MicroCog, 197
Microgenesis, 86–89
  critique of studies, 88–89
  melodies/tones perception study, 87
  optical rhythm studies, 62–63, 86–87
  research method, features of, 11, 47
  as therapeutic tool, 207–208
Miller, Arnold, 181, 185–186, 189, 195, 198, 345
  remembrance of Werner, 225–228
Mind of Primitive Man, The (Boas), 138
Monkeys, logico-mathematical cognition, 311–313
Morant, Ricardo Bernardino, 128
Morphology, Goethe on, 76
Motion perception, and vicariousness, 156
Motor activity
  and gestalt formation, 67, 97
  and rhythm, 44–45, 67
  and sensory functions, 35, 266
  in sensory-tonic field theory, 35, 168
Movement
  apparent motion, 267
  and attention, Werner's studies of, 61
  and perceptual concepts, 61, 266
  phenomenal theorems of, 270–271
Muchow, Marta, 14, 20, 90, 347, 353
Mulholland, Beverly, 204
Mulholland, Thomas, 130
  remembrance Werner, 201–205
Müller, Georg E., 63, 398
Muller-Lyer illusion, 168, 209–210, 278
Müller, Ulrich, 25
Munich years (1915–1917), 19, 58, 62–63
Murdock, George Peter, 128
Music
  critique of studies, 91
  microgenetic studies, 86–88
  musical development study, 68, 89–90, 402
  Werner's training in, 19, 59
Musil, Robert, 28

Naming
  and autism, 374–375
  in symbolic-sign stage, 373–375
Natural disasters, and person-in-environment system, 293
Naturphilosophie, Goethe approach, 8–9
Nazi era, Werner during, 13–14, 70–71, 204–205, 398
Neurophysiological principles, of learning, 34
Node descriptions, features of, 5–6
Northrop, F.C.S., 140
Notes on Representation and Interpretation (Kaplan), 144
Nursery school, transition to, 298–299

Objective-technical perception, versus physiognomic perception, 46–47
Object metaphors, 92

Object-organism relationships, and perception, 157, 166–170
Object permanence
  human infants, 314–315
  primates, 314–315
Object-self, 170
On Artistic-Individual Processes (Über die künstlerisch-individuellen prozesses), 61
On Optical Rhythmics (Über optische rhythmik), 73
"On the Problem of Motor Shaping" (Über das problem der motorischen gestaltung) (Werner), 67
Ontogeny, 89–91
  cognitive. *See* Cognitive development
  magical thinking studies, 90–91
  musical development study, 89–90
  and orthogenetic principle, 78, 100
Optical rhythms theory, 62–63, 86–87
Orchestration
  as analogy, 252–255
  as integration, 252–255
Organismic-developmental theory
  application to psychopathology, 324–327
  Kaplan on, 141–142
  relationship to sensory-tonic field theory, 170–173
Organization of Pathological Thought (Rapaport), 211
Origin, relationship to development, 39
Origins of Lyric, The (Die ursprünge der lyric) (Werner), 20
  content of, 42–45
  See also Lyric
Origins of Metaphor, The (Die ursprünge der metaphor) (Werner)
  content of, 39–42
  as habilitation thesis, 65
  See also Metaphors
Orthogenetic principle
  concept-pairs in, 99, 406–407
  in developmental theory, 6, 10
  development of, 45, 67, 77, 402
  differentiation in, 99–100
  elements of, 99–101, 281–282
  forms of organization, 241, 248–249
  Kaplan on, 139–141
  and ontogeny, 100
Outline for a Table of Concepts on Developmental Basis (Skizze zu einer begriffstafel auf genetischer grundlage) (Werner), 61
Overton, Willis, 130
Paranoia
  as defense, 334
  features of, 334
Parapsychology, 203
Pars pro toto, 346, 349
Pavlov, Ivan, 95, 360, 388
Perception, 46–49
  assimilation and dissimilation, 67
  and emotions, 69–70
  and experience, 228
  inkblot tests, 109–110, 113–117
  microgenetic studies, 11, 47, 86–89
  ontogenic study of, 164–170
  optical rhythms theory, 62–63
  pathologies, Werner's study of, 66
  physiognomic, 46–49
  postulates related to, 164–165
  psychopathology, effects of, 96, 157, 159, 161, 166
  sensory-tonic field theory, 11–12, 35–36, 110–113, 155–173
  symbol formation research, 12–13, 111–113
  See also Psychophysics; Visual perception; individual theories
"Perception of Part-whole Relations in Middle and Old Age" (Werner, Comalli, and Wapner), 186
Perceptual adjacency, 269, 270, 274
Perceptual concepts, 61, 266
Perceptual dynamics, 266
Perceptual objectification, conditions for, 171
Persecution delusions, 334
Person-in-environment system
  critical transitions across lifespan. *See* Person-in-environment transitions
  distancing from environment, 296, 300–301
  levels of, 171–172
  tasks/goals and development, 288
Person-in-environment transitions, 286–302
  assumptions related to empirical framework, 289–290
  cross-sectional research, 295–296
  events initiating transitions, 291
  implications for practice, 300–302
  and interpersonal relations, 288, 291, 293–294
  longitudinal research, 296–299
  non-event and event transitions, 287
  and physical events, 288, 290–291, 293
  and progressive change, 287
  and psychological changes, 290–293
  and regressive change, 286–287
  reorganization methods, 287
  and sociocultural events, 288, 291–292, 294–295

Perspective by incongruity, 145
Perspectives in Psychological Theory (Festschrift), 127
Perspectivism, 145
Phenomenal psychology, 261–282
  appurtenance in, 262–264, 268–270, 272–275, 277, 279
  color/brightness theorems, 272–274
  cortical tonic expressivity in, 262, 266–268, 269, 271–279
  distance theorems, 272
  figure organization theorems, 275–277
  geometric illusions theorems, 277–278
  movement theorems, 270–271
  size theorems, 271–272
  spatial orientations theorems, 274–275
  subjective surfaces theorems, 278–279
  symbolic meaningful conceptualizations in, 262, 264–265, 269–279
Phenomenal surfaces, 279–281
Phillips, Leslie, 249, 323–324, 328–331
Philosophy of Symbolic Forms (Cassirer), 126, 132
Phrenology, Werner on, 96–97
Phylogeny, 13, 78
  of cognitive ontogeny. *See* Cognitive development
Physical cognition
  capuchins, 315, 317–318
  defined, 307
  human infants, 314–315
  macaques, 314–315, 317–318
Physiognomic language, 82–84
  compound words, 82
  connotation of words, 83–84
  critique of, 85–86
  cross-cultural approach, 82–83
  physiognomic grammar, 85
  scope of study, 48–49
Physiognomic perception, 46–49
  critique of, 86
  difficulty in study of, 47
  features of, 47–49, 84, 163
  meaning of, 46–47
  methods of study of, 85, 163
  versus objective-technical, 46–47
Physiognomy, 81–86
  and inspirational expression, 408
  of language. *See* Physiognomic language
  methods of study of, 85
  of perception. *See* Physiognomic perception
Physiological stimulation, sensory-tonic, meaning of, 265–266
Piaget, Jean
  and developmental science, 4, 7
  compared to Werner, 219, 248, 251, 392, 400, 415
Pierce, Charles, 129
Pneuma
  and metaphor, 40–41, 92
  and taboo, 40–41, 92–93
Poetry, and lyric, 43–45
Poggendorff illusion, 278
Pollack, Bob, 128
Polyfigurative phenomena, 402
Ponzo illusion, 277
Positive postulate approach, 6
Positivism, 29
Practical concepts, 33–34, 82
Preyer, William, 4
Price, H.H., 231
Primates
  language learning, 211
  logico-mathematical cognition, 307, 310–318
  object permanence, 314–315
  physical cognition, 314–318
Primitive
  Kaplan on, 134–137
  use of term, 42, 241
Primitive Culture (Tylor), 138
Primitive cultures
  aesthetic phenomena in, 42–43
  critique of Werner, 79–81, 142
  cultural development, levels of, 39
  culture, definitions of, 137–138
  lyric in, 43–44
  shift of motive in, 39–40, 45
  taboo and metaphor, 40–42
  Werner's approach to, 39
  comparisons to West, 79–81
Primitive function, elements of, 42
Primitive lyric, 43–44
Primitive Man as Philosopher (Radin), 230
Primitive mind, Werner's elements of, 42, 93
Primitive personality, Werner on, 13, 79
Primitive World and its Transformations (Redfield), 138
Privatdozent, Werner as, 55, 65, 126
Probalistic epigenesis, 418
Problem of Conscience, The (Kehr), 56
"Process and achievement: A basic problem of education and developmental psychology" (Kaplan), 197
Process and Achievement (Werner), 20
Progression-regression hypothesis, 157

Pseudo-metaphors, 40
"Psychoanalysis as a Developmental Psychology" (Rapaport), 127
Psychoanalytic model
of autism, 347–348
primary and secondary processes, 242, 251
of psychopathology, 327, 329
Werner's influence, 211–212
Werner's opposing theory to, 12, 414
Psychological Laboratory (Hamburg)
Stern as director, 56–57, 59
and University of Hamburg, 64–65
Werner at, 20, 55–56, 58–59, 64–65
Psychological Theory of Practice, A (Eine psychophysiologische Theorie der Übung) (Werner), 73
Psychology
American compared to European, 186, 188, 394–395, 397–399
criticism of (1930s), 70
holistic school of, 36–37, 398
phenomenal psychology, 261–282
romantic psychology, 70
theories, modern formulation of, 7–8
Psychology of Aesthetic Experience (Zur Psychologie des ästetischen Genusses) (Werner), 19, 60
Psychology and Criticism: Literary and Otherwise (Kaplan), 144
Psychology of the Perception of Change (Stern), 59
Psychopathology
and body perception, 161
and cognition of magnitude, 248–249
developmental approach, 327–340
developmental differences (chart), 335
developmental theory, supporting research, 331–332
hallucination and delusions, 331
induced, psychotropic drugs, 96
and mental retardation, 339–340
and object-organism relationships, 157
organismic-developmental theory of, 324–327
and person-in-environment transitions, 290, 292
prognosis and outcome, 332
psychoanalytic model, 327, 329
relocation, effects of, 298
and repressed depression, 333–334
role orientation, 329
Rorschach developmental scoring, 326–328
self-image disparity, 335–339
social competence and diagnosis, 328–332
and space perception, 159
symptoms, categories of, 329–330
See also Schizophrenia
Psychopathology of Everyday Life, The (Freud), 242, 251
Psychophysics
Exner's work, 60
Gestalt concepts, 46–47, 60, 98
Werner's writing, 20, 46–49
See also Perception; Visual perception
Psychotropic drugs
and body perception, 161–162
and induced psychopathology, 96
and space perception, 159

"Radical Metaphor, Aesthetic and the Origin of Language" (Kaplan), 132
Radin, Paul, 134, 230
Rand, George, 130
Rapaport, David, 127, 128, 211, 242–243, 397
Rawls, John, 251
Reading/writing
cognitive-developmental systems application to, 376–383
Symbol Accentuation program, 347, 381–383
and symbol stage, 375–377
Recapitulation theories, 78–79
"Reculer pour mieux sauter" (draw back to leap), 301
Redfield, Robert, 134, 138
Regression hypothesis, 157
Rehabilitation psychology, 186
Reid, Richard, 187
Relational processes, node descriptions, 5–6
"Relation between perceived location of objects and perceived location of one's own body" (Werner and McFarland), 185
Rhyme, and lyric, 44
Rhythm
defined, 44
development of, 44–45
and Gestalt concepts, 67, 87
and motor activity, 44–45, 67
optical rhythms theory, 62–63, 86–87
phrasing of, 63
Werner's studies of, 44–45, 62–63, 67, 86–87
Rituals
and autistic children, 365–366
and normal development, 364–365
Rodnick, Eliot, 128
Romantic psychology, 70

Rorschach, responses and psychopathology, 326–328
Rosenblatt, Bernie, 128
Rothschild, David, 249
Rozenkrantz, Paul, 216
Russell, Robert, 130
Russian language, 83

Safety-belt use, and person-in-environment system, 294–295
Sander, Friedrich, 11
Schafer, Roy, 128, 208
Scheerer, Martin, 14, 20
Schiller, Peter, 130
Schizophrenia
  as camouflaged depression, 333–334
  concept of magnitude, 248–249
  developmental approach, 332–334
  paranoid compared to nonparanoid, 333
  See also Psychopathology
Schnall, Mel, 130
Schnitzler, Arthur, 28
Schönberg, Arnold, 28
Schuller, Gunther, 255
Scientific approach, Kreuger on, 38
Scientific concepts, 34
Scientific paradigms, and historical eras, 250–251
Self-consciousness, Mead on, 42
Self-image, cognitive-developmental differences in, 335–339
Self-protection
  and magic, 243–244
  and metaphors, 41–42
Self-worth, and depression, 333–334
Semiotic construction, Werner on, 12
Sensation
  intensity, study of, 95–96
  Mach on, 29
  sensorium commune, 48, 76, 84
  synaesthesia, 77
  Werner's studies of, 45–46, 48, 66–67, 69–70
Sensation-concepts, 33
Sensorimotor development, Werner's concept, 346
Sensorium commune, meaning of, 48, 76, 84
Sensory deprivation studies, cortical effects, 267–268
Sensory functions
  and motor functions, 35, 266
  in sensory-tonic field theory, 35
Sensory-tonic field theory, 155–173
  autokinetic motion, 164
  basic features of, 11–12, 110–113, 155–156
  body perception, 161–162
  developmental changes, effects of, 164
  object-organism relationships in, 157, 166–170
  perceptual development, ontogenetic study, 164–170
  person-in-environment system, levels of, 171–172
  physiognomic perception, 163
  relationship to organismic-developmental theory, 170–173
  sensory-motor functions in, 35, 168
  sensory-tonic, meaning of, 265–266
  space localization, 163–164
  space perception in, 159–161
  supportiveness concept, 162
  verticality, perception of, 157–159, 165, 167–170
  vicariousness concept, 162–163
  Werner's development of, 35–36
"Sensory-tonic Field Theory of Perception" (Werner and Wapner), 185
Sequence, as psychological principle, 256
Shafer, William, 211–212
Shift of motive, 39–40, 45
Shilkret, Bob, 130
Sigel, Irving, 198
Sign stage, 350–351
  and autism, 351–352, 357–359
  normal features, 350–351, 357–359
  systems development during, 359–360
Similes
  and lyric, 44
  compared to metaphors, 40
Simultaneity, as psychological principle, 256–257
Sinnespsychologie (psychology of senses), 66
Size, phenomenal theorems of, 271–272
Sketch maps, longitudinal research, 298
Slepian, Howie, 130
Social competence
  autistic child, 386–387
  and mental retardation, 339–340
  and psychopathology, 328–332, 336
Solomon, Becca K., 181
Sons of Gründer, 27–28
Sounds, *sensorium commune*, 48
Space localization, 163–164
  features of, 163
  methods of study, 163–164
Space perception, 159–161
  and age, 159
  and body parts size, 160–161
  and body position, 160, 165

and psychopathology, 159
and psychotropic drugs, 159
and surrounding space, 160
Spatial orientations, phenomenal theorems of, 274–275
Speier, Sybil, 130
Spielberger, Charlie, 132
Spiral, of Exner, 60
Spitz, Rene, 348
Standardized tests, 197
Static concepts, 33–34, 61, 82
St. Clair, Jane, 131–132
Stein, Don, 129
Steinthal, Heymann, 4
Stern, Clara, 31
Stern, William, 55–59
areas of research, 59, 68, 70, 100, 395
and Nazi regime, 71
Werner as assistant to, 20, 55–59, 64–65, 233
writings of, 31, 59
Stimulation, sensory-tonic nature of, 155–156
Stöhr, Adolf
on blind spot, 35
as mentor, 26, 30–32
theories of, 30–32
Stroboscopic vision, 60
Structure
concept-pairs, 99–100
and function, 5
Werner's studies of, 66–68
of words, 68, 97–98
"Studies on the Laws of Structure" (Studien über strukturgesetze) (Werner), 66–67
"Studies in Physiognomic Perception: V. Effect of Ascending and Descending Gliding Tones on Autokinetic Motion" (Werner, Miller, and Wapner), 185–186
Studies on the Psychology of Concepts (Begriffspsychologische Untersuchungen) (Werner), 62
"Studies in Vicariousness: Motor Activity and Perceived Movement" (Werner, Krus, and Wapner), 185
Stumpf, Carl, 57, 398
Subjective surfaces, phenomenal theorems of, 278–279
Subjective teleology, Werner's rejection of, 45
Subject-object distinction, 100
Supportiveness concept, 162
Surfaces
phenomenal, 279–281
subjective, 278–279
Swing Era, The (Schuller), 255
Symbol Accentuation Reading Program, 347, 381–383
Symbol formation, 111–113
and conceptual developmental level, 346
and distancing, 12–13, 45, 411–412
levels in research on, 112
research methods, 111
Symbol Formation (Werner and Kaplan), 12, 116, 130, 133–134, 226, 231, 234
Symbolic meaningful conceptualizations, axiom of, 262, 264–265, 269–279
Symbolic-sign stage, 350–353
and autism, 352–353, 374–375
and body perception, 372–373
and naming, 373–375
normal features of, 351, 372–374
Symbol stage
normal features, 350, 375
and reading/writing, 375–377
Synaesthesia, meaning of, 77, 254
Syncretic-discrete concept pairs, 99, 406–407
System formation, autism, 359–360

Taboo
and metaphors, 40–42
and *pneuma*, 40–41, 92–93
Task mastery, mental automatization of, 31
Tax, Sol, 134
Telos, 5
Theory of Symbolic Transformations, The (Carini), 265
Thermodynamics, 7
Thing-constancy, 170
Thompson, Nick, 130
Thought, and language development, 31
Three Axioms for a Theory of Conduct (Carini), 265
Titchener Circles illusion, 168
Tones, perception studies, 87
Tonus concept, 409
See also Sensory-tonic field theory
Transitions
across life span. *See* Person-in-environment transitions
and autistic children, 354–356
Transposition principle, 69
Trebitsch Prize, 19, 60
Truth, coherence theory of, 252
Tylor, Edward, 138

Uexküll, Jakob von, 20, 55, 66, 347, 395
Umwelt (world around one), derivation of, 347

Umwelt Assessment
of autistic children, 353–359
elevated Swiss cheese board task, 355–356
parent/child relationship task, 357
rake-obstacle task, 355–356
stacking cups and bowls task, 354–355
suspended ball task, 353–354
Unitas multiplex, 70
"Unity of the Senses" (Werner), 254
University of Hamburg
habilitation procedure, 20, 55
Psychological Laboratory as part of, 64–65
Werner appointment as professor, 20, 55, 65
Werner's work at, 66–71
Uzgiris, Ina, 129

Vague-clear concept pair, 99
Valsiner, Jaan, 130, 391
Van der Veer, René, 75
Vasomotor system, and excitation, 94
Verticality, perception of, 157–159, 165, 167–170, 270
Verworn, Max, 70
Vicariousness concept, 162–163
development as variable, 163
motion perception, 156
reciprocity in, 266
vicariousness, meaning of, 156, 162
Vienna Institute of Technology, 19, 59, 399
Visual perception
blind spot, 19, 35, 60–61
geometrical-optical fusion, 35, 67
phenomenal psychology concepts, 261–282
Vitalistic biology, 55
Vogel, Susan, 189, 194–195
Vogel, William, 130, 132, 181, 188–189, 193, 197, 226
Völkerpsychologie, Wundt on, 37
Vygotsky, Lev
on concept formation, 35–36
and developmental science, 4, 8, 391
method of double stimulation, 411
Werner's influence on, 98, 101

Waddington, C.H., 9
Walsh, Mary, 244
Walter Fernald School, 184
Wapner, Seymore, 128, 155, 164, 181, 183, 185–186, 192, 196, 202, 214, 230, 232, 285
Watkins, Mary, 127
Wayne County Training School, 3, 14, 395
Wechsler Adult Intelligence Scale for Children-Third Edition Process Instrument (WISC-III-PI), 197
Weinreb, Joseph, 225, 348
Werner, Emilie Klauber (mother), 19, 27
Werner, Erica (wife), 20, 205, 219, 231
Werner, Heinz
on aesthetic phenomena, 19, 26, 39, 42–45
biographical timeline for, 19–21
at Brooklyn College, 20, 125, 183, 209, 222
and Karl Bühler, 19, 58–59
at Clark. *See* Clark University
on concepts, 16, 32–36, 61–62
developmental theory of. *See* Werner's developmental theory
early life, cultural/intellectual environment, 27–28
education of, 19, 28, 399
Sigmund Exner as mentor, 58–60
formal parallels concept, 403–405
and Gestalt concepts, 46–47, 60, 62–63, 66–68, 96, 261–262, 402
habilitation thesis of, 20, 55
Hamburg years, (1917-1933), 20, 55–71, 399, 400
and holistic approach, 69–70, 97–98
on intensity, 95–96
and Bernard Kaplan, 121–152
Felix Krueger as mentor, 36–38
and Oswald Külpe, 19, 58–59, 62, 63
Ernst Mach as mentor, 26, 28–30, 33, 36
on magical thinking, 90–91
on memory and learning, 34, 94–95
methodology of, 10–11
Munich years (1915–1917), 19, 58, 62–63
music, study of, 19, 59, 61
and Nazi regime, 13–14, 20, 70–71, 204–205
on origins of lyric, 42–45
on origins of metaphor, 39–42, 45
orthogenetic principle, 45, 67, 77, 99–101
personality traits of, 193–196, 201–205, 210–211, 222–223, 227–228, 233–234
compared to Piaget, 219, 248, 251, 392, 400, 415
popular science articles of, 96–97
as *Privatdozent*, 55, 65, 126
at Psychological Laboratory, 20, 55–56, 58–59, 64–65
psychophysical studies, 35–36, 46–49, 60–61
rhythm, studies of, 44–45, 62–63
on semiotic construction, 12
sensation, studies of, 45–46, 48, 66–67, 69–70
sensory-tonic field theory, 35–36, 110–113, 155–173

and William Stern, 55–59, 64–65
Adolf Stöhr as mentor, 30–33, 35
structure, studies of, 66–68
symbol formation theory, 12–13
Trebitsch Prize, 19, 60
at University of Hamburg, 65–71
Vienna to Hamburg transition, 58–64
Vienna years (1912–1915), 19, 27–49, 399
at Wayne Country Training School, 3, 14, 395
writings of, 20–21, 60–62, 65–68, 98–101, 185–186., *See also* individual titles
Werner, Jo (wife), 20, 65
Werner, Leopold (father), 19, 27
Werner's developmental theory
and autism, 345–349
biological-psychological approach, 45
Cassirer as influence, 20, 26, 46, 55, 65, 69, 111, 115, 150, 395, 412–413
coexistence concept of development (CCD), 239–257
contributions to developmental science, 1–2, 391–414
creativity in, 39
and critical person-in-environment transitions and life span, 285–302
cross-cultural approach, 61–62, 79–81
development, defined, 324
developmental experiments, 11
ethnography in, 91–94
evolution of, 68–70, 76–81
goals of, 349
Goethe as influence, 8–9, 42, 76–78, 139, 234, 402
Hegel as influence, 77–78
Herder as influence, 76–78, 142
holistic approach, 69–70, 97–98
of lyric, 45
magic in, 90–93, 243–244, 347
maturity, elements of, 346
of metaphor, 45
microgenesis in, 11, 78, 86–89
of music, 90–91
ontogeny in, 78, 89–91
orthogenetic principle, 45, 67, 77, 99–100
perceptual development, 164–170
physiognomic perception, 46–49
physiognomy in, 81–86
of psychopathology, 323–340
roots of, 76–81
of self-image disparity, 335–339
sensorimotor development, 346
shortcomings of, 79–81, 85–89, 91–94, 101, 142, 349, 414–419
symbolic functioning, 111–113, 346
Umwelt concept, 347
written text on, 98–101
Wertheimer, Max, 261
Wertsch, Jim, 130
White, Leslie, 134
White, Shep, 132
Wiener, Morton, 129, 184, 188, 192
Williams, Raymond, 137
Wohlwill, Jack, 129
Worcester State Hospital, 184, 323–324
Worcester Youth Guidance Center, 184
Worchester Social Attainment Scale, 249
Word-Context Test, 125, 131, 222, 413
Word meaning
lapse of meaning, 345, 350
naming, 373–375
teaching and autism, 362–364
Words
linear schematization technique, 411–412
reading/writing and autism, 377–383
structure, study of, 68, 97–98
See also Physiognomic language
World Hypotheses (Pepper), 132
World War I, 56, 64
World War II, Nazi era, 13–14, 70–71, 204–205, 398
Writing. *See* Reading/writing
Wundt, Wilhelm
on apperception, 35–36
on creative synthesis, 10
and experimental psychology, 4, 7, 30, 63
on form and function, 45
on *Völkerpsychologie*, 37
Würzburg School, 58, 111

Zigler, Edward, 132, 198, 323–340
Zigler-Philipps Social Competence Scale, 331
Zweig, Stefan, 28