Cultural Psychology of Education 2

Giuseppina Marsico *Editor*

Jerome S. Bruner beyond 100

Cultivating Possibilities

Springer

Cultural Psychology of Education

Volume 2

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Editor

Jerome S. Bruner beyond 100

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Preface of the Series Editor

Jerome Bruner: The Psychology in Its Making

It was a sunny early afternoon of June in 2011. Jerry Bruner and I were sitting in a nice restaurant in front of the sea in Salerno (Italy). During our endless conversation after lunch we started entertain a project: to write something in the same vein of the *Six Memos for the Next Millennium* written by Italo Calvino (1988) (original Italian title: *Lezioni americane. Sei proposte per il prossimo millennio*): a kind of book based on the series of Bruner's lectures in Italy. That idea keep stayed at the periphery of our minds for a long time and sometimes resurfaced in our later meetings.

But life is nothing then a constant effort in cultivating new possibilities and that idea, which has flown over our heads for years, has been elaborated and now become a tangible book placed in the Springer Books Series *Cultural Psychology of Education* that I'm editing.

After the inaugural book (Marsico et al. 2015) that was devoted to rethink the relationship between actors, practices, and borders within the educational contexts, this second book gives a substantial contribution to the recent advances in cultural psychology by looking at the extraordinary scientific production of Jerome Bruner in the special occasion of his centennial.

This book, in fact, is meant to celebrate the 100th birthday of Jerome Bruner, one of the most relevant scholars in contemporary psychology. Though his contribution to psychology, education, and law has been massive, Bruner oeuvre has still a lot to say in terms of unexplored possibilities. The book "Jerome S. Bruner beyond 100: Cultivating Possibilities" is collecting contribution from Bruner's students and colleagues worldwide that will try to use his legacy to look forward to the future of psychology, exactly in the spirit that Bruner himself is still interpreting. Thus, no celebration but a "genuine interest for the emergence of the novelty" and the potentialities that Bruner's work in cultural psychology can still develop, with concepts such as ambivalence, intersubjectivity, purpose, possibilities, wonderment. The book shares the interdisciplinary perspectives of scholars coming

from the different world areas—USA, Italy, Brazil, France, Denmark, UK—and different fields—psychology, education, law, philosophy, computing sciences—who provide the tale of Bruner's academic and personal life and what is still to be done on the basis of his scientific production. The volume contains also an interview to Jerry Bruner and an almost inedited work of him.

This book is unique in its nature and is the only one published in this special occasion. As it would be clear in the next pages, the aim of the book is not only to celebrate Jerry's extraordinary career, but mostly his natural tendency to think about lives developmentally. This idea permeates the whole volume and it is announced already in the book's title: *Jerome S. Bruner's beyond 100: Cultivating Possibilities*.

Salerno, Italy
August 2015

Giuseppina Marsico

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Introduction

I don't honor my students for echoing me back.
I want to find out where they're going to take the idea next
(Jerome Bruner)

Living to Tell the Tale of Psychology: Jerome Bruner the Giant

Abstract Jerome Bruner is undoubtedly one of the scholars who has chiefly contributed to the advancement of psychology. He passed through almost all the psychological paradigms helping to illuminate the relationship between mind and culture, between human beings and contexts in which they operate and in which the process of sense making takes place (just for mentioning something of his vast intellectual program). He has built and renewal psychology and other sisters discipline from inside, but people who directly know him are fascinated by his capability to tell this incredible professional trajectory as an amazing adventure. The fine novel *Living to Tell the Tale* by Gabriel García Márquez is the most appropriate for describing the extraordinary convergence of living, creating, and telling psychology as in the Jerry's case. Jerry Bruner always had and still has a genuine interest for the emergence of the novelty and this book underlies exactly the innovative action Jerry made along the history of contemporary psychology which is still actively persisting. The book focused on the analysis of Jerry work in cultural psychology at the intersection with other field such as education, philosophy, computational science, and law.

Keywords Bruner, 100th, Giant, Interdisciplinary, Innovation

The academic world is basically divided in two groups of people: who construct new knowledge and who recall, even elegantly, what others are built up. Then, aside of these, there are few who show superlative scholarly qualities. Yet Jerome

Bruner (Jerry) is not among them. He is far beyond this rough partition walking a span over the others' heads. Jerry Bruner is definitively a giant making the history of psychology while fertilizing other social sciences with his ideas over the last seventy years. Bruner is undoubtedly one of the scholars who have chiefly contributed to the advancement of psychology. He passed through almost all the psychological paradigms helping to illuminate the relationship between mind and culture, between human beings and contexts in which they operate and in which the process of sense making takes place (just for mentioning something of his vast intellectual program).

He has built and renewed psychology and other sisters disciplines from inside, but people who directly know him are fascinated by his capability to tell this incredible professional trajectory as an amazing adventure. The fine novel *Living to Tell the Tale* by Gabriel García Márquez (original Spanish title: *Vivir Para Contarla*) is the most appropriate for describing the extraordinary convergence (or the total overlapping) of living, creating, and telling psychology as in the Jerry's case.

With his 100 years old, Jerry, the smiling giant, is here for telling us the tale of psychology keeping questioning who we are as humans. On the top of his centennial, Jerry is still interested in going beyond the given information, cultivating possibility, and new possible worlds.

This book is exactly in this spirit. My aim was in fact, since the beginning, do not just celebrate the Jerry's remarkable biological achievement. As all the contributors to this volume I have had the fortune to meet Jerry and this had greatly impacted my intellectual life. Yet, I always find very trivial jumping on the giant' shoulders which is, unfortunately, the most common nowadays academic sport. The proliferation of publications in which the authors state they are "Piagetian," "Vygotskian," and "Brunerian" as if this give them a sort of scientific authority *per se*, without moving any step further, produces the death by asphyxiation of those theoretical perspectives (Valsiner 2014). The extraordinary liveliness of Jerry, his restless curiosity, and his love for challenging intellectual conversations deserve a different form of celebration. Thus, the book's goal is not to commemorate the past, but to look toward the future of the discipline. Jerry always had and still has a genuine interest for the emergence of the novelty and, in my opinion, this volume underlies exactly the innovative action Jerry made along the history of contemporary psychology which is still actively persisting. The volume focused on the analysis of Jerry work in cultural psychology at the intersection with other field such as education, philosophy, computational science, and law. This is a collective and interdisciplinary book based on contributors of distinguished scholars, mainly former students and colleagues of Jerry, who provide, from different angles, the tale of Jerry's academic (and not only) life and what is still to be done on the basis of his scientific production. So it is not a Festschrift nor an official biography. Even the interview with Jerry, here presented, is not about his chronological story line, but is more about reminiscing something from the past in serving the future. It ended up in a very warm and intimate conversation, as Jerry loves, in which he showed his fascinating "ability to tell a tale and teach you something at the same time" (Garland, this volume). After all, I gave up from the very beginning to the impossible task of summing up the enormous production of Jerry's along his brilliant career. I rely in the capability of the authors of this book to offer a detailed

and colored pictures of Jerry from which the reader will reconstruct the whole portrait of this smiling giant over the big three periods of his academic trajectory (Harvard, Oxford, New York). In line with Jerry's statement in epigraph, I think the best gift for his 100th birthday is to see how deeply his ideas have fertilized other minds and how many different research programs have been promoted.

Talking with Bruner

Talking with Jerome Bruner is almost like a Mozart symphony. He has an impressive ability *to keep the conversation going* and a genuine interest for his interlocutors. In our endless conversations we touched upon a notable variety of topics. What sets the stage of such a kind of challenging conversations is the Jerry's 6.30 p.m. whisky single malt and my espresso sipped in front of the seaside in Salerno (Italy) or in his apartment in New York. Spending hours talking with Jerry represents the most adventurous trip I have never made in my life. Our starting differences in almost everything (age, gender, social milieu, academic role, and even our usual drink) turned in an adamant synthesis of our curiosity for the life. So, very often our conversation ended with more questions than answers, but I have never felt stupid on Jerry's side. Maybe astonished by his incredible life, but never stupid despite my blatant lack of preparation in more than half of the issues discussed. This is just because "Jerry's capacity to find fascination in everything" (Amsterdam, this volume) even in my impossible questions.

Let Me Tell You a Story!

Jerry Bruner often starts talking with people saying: "*Let me tell you a story*!" I would do the same. I was just graduated when my supervisor put in my hands *Acts of meaning* (1990) and *The culture of education* (1996). This was the starting point of my exploration of cultural psychology field. In 2007, after my doctorate, I had the fortune to personally meet Jerry who went in Salerno, an already well-known place for him because the *Lauream Honoris Causa in Education* in 2002 and a previous scientific relationship with other colleagues.

I clearly remember when I met Jerry the first time. It was an extremely hot afternoon in June and I walked along the platform with my trembling legs on the high-heeled sandals. I was going to welcome Jerome Seymour Bruner "the giant" who immediately and generously smiled at me asking with curiosity who I were. From then, the things went magically smoothly ahead and some years later Jerry started planning his regular visit to me in Salerno that typically happened after his yearly stay in Reggio Emilia and before going to Madrid.

Those days in Salerno were usually dedicated to informal, but very inspiring meetings and some academic events. In one of this formal occasion (June 29,

2011, at University of Salerno), we topically discussed the always intriguing issue of the relation between psychology, culture, and education.

In my short introduction I played a little with McLuhan's motto: "I don't know who discovered water but it wasn't a fish!" that means "*we are the fish and the water is our beliefs/assumptions, most of which have been with us so pervasively as to have disappeared from view*" (Kay, this volume), so I asked Jerry to answer the question: Did fish happen to discover water? Jerry's speech was rigorous, provocative, and elegant.

As fishes in the water, we are totally immersed into the culture, we breath culture, and we notice how much pervasive it is only when we come out for a while from the sea in which we are swimming and exploring other waters. In this new position we can see the cultural environment in which we are grew up from a different perspective. Bruner stated, in fact, that the psychological processes have a sociocultural origin and are influenced by the culture through its symbols and artifacts and by the context in which they take place.

In Bruner's perspective, for understanding the way in which we become humans, we need to see how the individual's actions develop by participating to the culture and by sharing its symbolic systems.

Bruner underlined the formative role of culture as the main factor in shaping the mind. In other words education is conceived in strict interaction with the culture in which it takes form. This connection implies a special attention to the contextual resources (in term of formal and informal education) available to the persons.

Bruner claimed that we just enter the culture, we do not learn it (Bruner and Feldam 1993). Besides, individual participates to the complex system of meanings at the point that it becomes a constitutive dimension of him/her own identity. At the same time individual, trough his hermeneutic intervention, contributes to the progressive, never-ending re-modulation of the culture. The complexity of the connection between psychology, culture, and education appears here in all its evidence.

This was and still is one of the threads of the rich Jerry's scientific plot that most captured my attention over the years. Of course it is strictly interwoven with many others as it will be possible to see in the next pages.

My short story ends here for leaving space to Jerry himself and, then, to other companions who will help the reader in diving in the vast sea of Jerry's ideas.

A Look at the Contributions

The book is organized in two parts. The first one "Bruner's Century" is composed by the interview with Jerry Bruner that was realized at Jerry's home in New York on January 26, 2015. This interview is not exactly a well prearranged and quick repartee, but it is more like a slow conversation where the *emotions are in motion*, our common memories are evoked into the dialogue, and our friendship is the ground for academic discourses. The result is a warm and shaded *watercolor* where personal and professional are interwoven. The interview has been afterward

complemented with a dedicated correspondence with Jerry which illuminates some points in his early academic stages left outside from the interview.

Some of the crucial issues such as, *ambivalence, human dilemmas*, *intersubjectivity,* Jerry touched upon during our colloquium have been, then, discussed by two invited commentators (Luca Tateo and Waldomiro J. Silva Filho) who topically provide further epistemological foundations to Jerry's theorization. This part is enriched by the presence of an almost inedited Bruner's writing. This is a priceless document. It is the lecture that Jerome Bruner gave at Clark University (USA) in 1968 just after von Bertalanffy (1966) and Piaget (1967) and included in the prestigious Heinz Werner Lecture Series. From 2007 to 2013 I have regularly visited the Department of Psychology at Clark University working with Jaan Valsiner and his scientific group that now has established the first international center for cultural psychology at Aalborg University (Denmark). Clark University was and still is one of the historically major scholarly institutions in USA. Nevertheless, few copies of the Bruner's Lecture are still at the Department of Psychology and Clark University Press, who printed the lectures series, disappeared long time ago. I brought one of those left copies to Jerry who wrote a dedication on it. Now, after getting all the permission, this manuscript come again to the light showing all its relevance. It should be read exactly "in light" of the advanced of the Brunerianan theories for tracing back the process of knowledge construction in this specific field over the years.

The second part of the book "Navigating the Bruner's Ocean" is based on the effort made by a group of eminent scholars to provide the coordinate for swimming in the water of Bruner's work. All of them have had, for different reasons, a special relationship with Jerry Bruner. I asked them to selectively choose a topic of interest and showing not only what has already been done, but also what is the possible step ahead on the basis of Jerry's legacy.

This part of the book clearly shows how many routes Jerry, as an excellent sailor, has explored along his life and how all of them are still vivid and promising.

As Valsiner (this volume) points out in his chapter, since his "Duke years" Bruner was at the forefront of the scientific investigation working with William McDougall around the idea of the purposefulness of the human actions. In continuity with this point, Harré (this volume) shows how Bruner started developing the idea of intentionality in the meaning making process and in the human conduct already in the 1970s, foreseeing, in such a way, a future that is not yet totally achieved. The following five chapters (Linaza, Delval, Esteban-Guitart, Ruiz Pérez & Linaza, Gómez, this volume) refer mostly to the Oxford period and to the penetration of Jerry's ideas in Spain. While Alan Kay (this volume) highlights the "hidden arts" inspired by Jerry's perspectives, Colette Daiute (this volume) discusses the notion of "relational narrating" as a process to foster the development of individual–society interactions. The next two contributions present the impact of Bruner's theory in the field of education. Barth (this volume) and Paufler & Amrein-Beardsley (this volume) show how the cognitive revolution and the cultural revolution have paved the way for significant advances in education launching new and complex challenges for the teachers, for the students and for the

educational policy at large. The intersection between psychology and law, which characterized the last period of Jerry's academic trajectory in New York, is well illustrated in the last five chapters (Fox, Garland, Davis, Chase, and Amsterdam this volume). Given the particular nature of this contributions among which there is the Amsterdam's masterpiece, they are introduced by a chapter written by Eleanor Fox who gives us not only the measure of the enormous impact of Jerry's ideas on the legal academy, but also concrete examples of Jerry's commitment against death penalty and prisons (especially in case on young people), poverty, and inequality.

All these chapters are preceded by a short and very personal homage to Jerry written by his beloved former student and close friend Howard Gardner. It is the only one contribution of such a kind, but those words well express all our deepest love for Jerry and seem to me a fitting tribute to a most remarkable man.

Acknowledgments

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Giuseppina Marsico

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Part I
Bruner's Century

Interview with Jerome Bruner: The History of Psychology in the First Person

Giuseppina Marsico

Introduction

Jerry and I agreed to meet at the end of January 2015. Our yearly visit was scheduled, this time, having a clear goal in mind: an interview[1] with Jerry for the book I was planning in the occasion of his 100th birthday. I had already invited the authors and discussed the general structure of the book with Jerry. He was very amused and pleased by the idea, and, as always, gave me his insightful suggestions.

So, the day of the interview I went to his place with all my stuff (audio recorder, camera, cables etc.) and a short list of questions in mind. It is curios, but it is quite difficult to select the "right questions" for a giant like Jerome Bruner. I fought long time with me myself for finding what I considered sufficiently adequate for such special event. On the other hand, I wanted to avoid any kind of formalism that would been dystonic and unnatural between Jerry and me.

All these thoughts ran in my mind while approaching Jerry's home in the middle of a snow storm. I arrived almost frozen to his door, but when Jerry welcomed me with his generous smile, I had the feeling that everything would gone well. We sat at his beloved desk, suffused with light, with hundreds of book around and just started talking.

[1]The interview has been slightly edited and some redundant sentences have been eliminated. The interview has been afterwards integrated by a dedicated correspondence with Jerry for complementing some points left outside from the interview (see the footnote 2).

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January 26, 2015 NYC, NY, USA
Jerome Bruner's home, 15.00 pm

P: Thanks Jerry for accepting this conversation. First of all, I'd like you to tell me the definition of psychology from your point of view.

J: What is psychology?

P: Psychology from your point of view, as you'd tell it to someone who doesn't know anything about psychology, but who is really interested in understanding and has plenty time to hear about it. I don't mean a summary of the history of psychology, but psychology from your point of view.

J: Well, from my point of view, psychology deals with a ((*looking out the windows*)) My God, look at that snow come down. Psychology deals with essentially conflicting situations, and deals with the fact that we have our own internal individuality that expresses internal desires, fears and something like that, and at the same time we are members of a culture, so we have to conform to ways of doing it, and even in the most intimate of situations. Like the two of us, for example, we haven't seen each other in a couple of years, but on the one hand, there is a desire to be genuine colleagues, culturally polite and so on like that, respectful. And on the other hand, I find you a very attractive person. So how do I put those two things together? And I think it's this conflicted nature that makes psychology so intriguing, that is to say, we exist in our culture and we exist within ourselves, and we're constantly trying to find situations in which we can make those two compatible somehow with each other, and we don't always succeed.

P: So, following your point, you're saying that ambivalence is a constitutive element of our human experiences? Is it? How we can solve this?

J: The word ambivalence is maybe too strong. I would say ((*pause*)) finding workable compromises, and this is to say…that I can both…have with you a professional, culturally proper life, and at the same time still find you a very attractive woman and I put these two together, and partly it's conflict, but partly it's generating a new, fresh, original kind of thing.

P: That is very true.

J: That's just to take an extreme personal example, but…so it is I mean,…in my work, I'm a professor here in a law school. I'm a psychologist. So the lawyers say, "Psychologically, what does this mean to you, Jerry?" And the psychologists say, "Working with those lawyers, what does that meant to you?" How do you put those two things together?

P: Yes.

J: And I say, there is no fixed, steady answer. It's part of what makes you creative.

P: All along your life, Jerry, as a scholar, you have been studying the human mind. In general terms you have been studying—

J: Perception, thought.

P: Yes I know, but in general terms, you have been studying human beings, right?

J: But I have also done and published a few studies on rats, you know.

P: I know ((*laughing*)). Could you tell us, Jerry, about that time when you worked with rats? I can't imagine you working with rats. Believe me!

J: But it was very funny, typical of my working with rats. When I had a particularly bright rat, and so on like that, when we finished the experiments, I would take the rat home and give it to my children, and they'd become my children's pets around house. So they weren't just laboratory animals.

P: It is very funny because you've passed through all the paradigms in the history of psychology and you made, you promoted the revolution in psychology.

J: The famous cognitive revolution…yeah.

P: Yeah…it was

J: To me it didn't seem like a revolution…This is obvious. What's revolutionary about the obvious?

P: You didn't feel a revolutionary person at that time?

J: I've never felt like a revolutionary person. That's not… ((*moving his fingers*))…

That's not true…I mean, I come from a fairly well-to-do family. The thing that was so interesting, when I finally I left home—I think I was sixteen or seventeen—to go off to Duke,[2] which was a very rich university, within a year I found myself with a little gang starting the Communist League. Then I said to myself,

[2]After the interview we continued our discussion by e-mail. In particular I sent to Jerry short questions about his time at Duke University. The Jerry's responses in the following e-mail represent a nice complementation of our conversation:
"Dear Pina, I was at Duke, as an undergraduate, from 1933 to 1938. I loved and hated the place—and have written a little about it in the my autobiography, IN SEARCH OF MIND. Part of the reason for loving it, I suppose, is that I was adopted by that Psychology faculty, and even given my own laboratory for my research. It was not only Zener, Adams, Lundholm, et al.*, but also the great William McDougall. There I was, not yet twenty, adopted as the promising bright kid. And the graduate students in psychology, sociology, and anthropology formed a kind of brotherly/sisterly group and took me under their wing. And it was the lot of them that tempted me to go on to Harvard for my graduate study. What I hated about the place was its politically conservative administration. As you can imagine I was politically far to the Left (as were my friends there) and I was not quiet about it. I used to write politically inflammatory letters to the University newspaper—those were the early New Deal days of President Franklin Roosevelt, my first political hero.*
II answer (same day): Oops, my computer sent off my email before I was done writing it! More later. I just want to add that it was right after Duke that I went off to Harvard. How I loved being a graduate student there!!!!". More later—and much love. Jerry (J. Bruner, personal communication, 2nd February 2015).
"Hi Pina,
This is just a quickie about those years at Duke.
There were two "sides" to it. One had to do with my plunge into psychology—about which more in a moment. Its underlying motif had to do with the active, planful nature of human mental activity, The other (more related to the first than I realized then) had to do with my relationship with women—the two "girl-friends" there at Duke whom I treasured sexually but who were also my intellectual buddies. We never made love in the sense of sexual intercourse, but had SUCH a close and warm relationship. We shared not only the typical necking but also the discovery of writers like James Joyce and Henry James.
My first course in psychology (sophomore year) was an introductory one given by the great William McDougall, the text for which was his then new THE ENERGIES OF MAN. He called his course "Hormic Psychology": It touched off something in me. So the next term I took a course from Donald Adams, "Comparative Psychology." Adams was a young guy, just back from a scholarship in Berlin where he'd studies mostly with Wolfgang Koehler. Very Gestalt! Very thoughtful, Then a bunch of courses in biology mostly concerned with endocrinology. And then I took a "Reading and Research" course working on my own research project to show the way that when rats were not pressed to make quick choices they did a lot of exploring around before doing so—PTE or preliminary trial and error. I was on my way! My hero at that point was the California psychologist, Edward Chace Tolman. And the structure and function of anticipation had me in its grip! I also got involved with another of my teachers, Karl Zener, who was working on the cognitive elements in classical Pavlovian conditioning—studying dogs in the classical setting, measuring their salivation. It was clear that anticipation played a huge role in all this. Pavlov's findings were not based on mechanical conditioning alone, but on anticipation as well—deeply cognitive. It was around then that the time had come for going off to graduate school, Harvard or Yale, the former far more cognitive in its psychological research than the latter. And all of my teachers agreed. And off I went—applied and was accepted.
[I must run off now! Is all this helping?)
All best. Jerry Bruner" (J. Bruner, personal communication, 7th April 2015).

that kind of strict ((*pause*)) left wing…a left wing that's dominated by a communist party. Where does that leave me…me? So I'm trying to find myself, and I'm also saying to myself, I can't find myself without a sense of the kind of world I live in, so…

P: Did you finally find yourself, or not…or, not yet?

J: No…what I have found, though, is that the moment you think you've found yourself Capital F, Capital Y, you say, Mhh ((*moving his head back, expressing doubt and skepticism/irony in his face, and, "it doesn't matter," with his hand*))

There is so much more yet to be developed, that is to say it's, it's like…most human things like that, it builds as you go…like I mean the fact that over time… How long have we known each other, five years, something like that? We have built a kind of relationship. It's a building. So I call my point of view toward the human being constructivism. There is no world there. We construct it. And it's the process of construction that's interesting, and that's where the society enters in.

P: Where the individual and cultural meet? Cultural and individual; where do they meet?

J: When do they meet? When are they not meeting? ((*laughing*)) They're always there. Yeah.

J: Culture and individuality, for example…Does it ever come to the point of where I can finally develop a way of dealing with the fact that I regard you as an intellectual colleague whom I respect, and yet somebody who I feel as enormously attractive. So how do I put those two things together?

P: Who knows?

J: We manage.

P: We manage.

J: Who knows? You say.

P: Here in place there is another…following your point, another element in place I think, which is the intersubjectivity?

J: That is so fascinating.

P: Yeah, I'm still searching for an explanation of intersubjectivity.

J: I think it is a condition, it's a condition of our species, intersubjectivity. It's the fact that I feel I can get inside your head and I feel that you're getting inside mine and I love it, I mean. What does it mean? You say, "Well why do you like being with Pina?" It's fun being with her. She's intelligent and attractive. And so it goes, when I move into other situations, that is to say ((*pause*)). My shoemaker, who does my shoes; he takes my shoes, when I come in there, and looks at them for a minute. He's Italian, and says: "Professor, is beginning to wear out." And I thought, it takes a close relationship for a shoemaker to say to one of his customers that his shoes are beginning to wear out.

P: My God.

J: Yeah so, but then, also I have to respect the institutional forms that exist that protect our relationship, not ours but the intersubjective and culturally appropriate, how those things fit together and that they make us what we are, and that when it works, as it's working now, it is a delight! If you say, "Professor, tell me what you mean by a delight. Ahh!! ((*moving his head forward*)) I wish I knew.

P: Me too. Nobody knows.

J: It is so funny, yeah.

P. Yes, it is.

P: There were turning points in your life.

J: What's that?

P: Turning points in your way to feel or in your way to think about human beings, about psychology? There were, in your life?

J: Well, I guess ((*pause*)) I guess that there is some way in which achieving your fullness as a human being creates a very ambivalent kind of situation. There's suffering with it, and there's joy to it. But I wanna say, that's part of the regular human condition. That's the way it is and anybody who doesn't recognize that point along with you ain't gonna be a close friend.

P: It is.

J: Yeah.

P: Jerry in your opinion, what is to be studied more, to be understood more of our human condition, for the future generations? On the basis of your scientific program, which is the direction in which we have to go…looking towards the future?

J: Yeah ((*pause*)) it's basically ((*pause*)) much more concerned with the human dilemmas that are characteristic of life, that is the sharing of dilemmas, I mean ((*pause*)) What's more important, whether its the relationship with your husband, or with a friend, but the business of…What am I supposed to do about that?

P: Yeah.

J. And it's funny because it has these things, that is… just on our own unique kind of thing. Why do I find you such an attractive person? It's partly because of your style of thought and being, like that. But it's partially because you're a very attractive woman. And ((*pause*)) sex, sociology, law, they find a way of going together to make a complicated wholeness of the world. A wholeness which, …

Every language has an expression for the kind of dilemma. I use the French one spontaneously … "what we do now?" Do I take you in my arms? Do I continue the conversation? The first one depends on a completely different set of circumstances than the second one, but the fact that they both exist…

P: Mmm hmm.

J: Same thing with your husband. I'm sure you … and I keep coming back to this very personal kind of thing. But it's also professional, that is to say, when I went into the law, I found myself—particularly the American law, by the fact that we're much too punitive…so many people in prison—We put them in prison in spite of the fact that we know when we put them in prison; they're gonna be the worse when they get out.

P: It is

J: But we go on doing this. So, I won't mention any names, but a well-known American judge and I were having a conversation and I was bringing up this cruel, criminal, crime-ogenic pattern of law, and he said to me: "For me, it's wonderful to find somebody who'll talk about these things because mostly, when they say, "I'd like you to meet my friend Judge ___," Ahhhh. They steer away from things of that sort, and I want to say that deep friendship has a wonderfully conflicted intellectual relationship to it. ((*pause*)) Yeah, ((*pause*)) but that's also true of marriage…It's funny, with love affairs, it's ((*moving his hands to show conflicts*)) because it never quite settles to the point of where you can say, ((*pause*)) this is enriching, this is…structuring and so on, like that. ((*looks outside the window*)) forgive me looking out the window to see whether it's still snowing.

P: Don't worry. It is still snowing

J: Indeed, oh you can see from … ((*pointing the window behind him*))

J: So how did I get it into psychology? I think I got into psychology, ((*pause*)) partly through the feeling that, as when I got away from my family and went off to the university, then developed very leftist, anti-establishment kinds of things, but there was also, "What function this is serving, for me or for society? It's very difficult, it's impossible being just yourself without also belonging in some way to the society, and more personally, to your friends, and to some interesting way to your opponents, your enemies. But you go ahead with your question.

P: I have some kind of semi-personal question. I would like to hear from you if you have any…if there were some experiences in your professional life, some events that were very critical for you, very problematic. Could you tell us, could you tell me one of the most critical moments in your life?

J: Ah! ((*long pause*)). Well, one of the most critical is a funny thing like that; you know, I was born blind ((*pause*)) and that made it easy for me when my sight was restored, restored with the help of glasses, like that ((*removing and showing his glasses*)) ((*pause*)) made it, how do I put it, necessary for me to develop a kind of constructivist view, which I didn't have the word, then. But, there were episodes in and out of psychology. One happening out of psychology, when I was in Paris at the very end of the war—You know how I got there and the rest of it—I got to know a young intellectual, at that point he was not yet or was a little later to become very famous, Jean-Paul Sartre—very artsy guy—and also, his lady. And,

we use to talk about reality; what's real. And he would say…I won't try to use his French. He would say, "Jerry, the reality that you're trying to cope with is also constructed. There is no such thing like, "reality," like that. So early on, we used to have these fascinating sessions in various French restaurants, but also it turned out that Simon de Beauvoir was one hell of a good cook. She was one—I loved her.

P: Admit Jerry, you felt in love with Simon de Beauvoir?

J: ((*thinking*)) Yeah, a little bit.

P: I think so ((*laughing*))

J: I think so, yeah.

J: Although she was ten to fifteen years my senior, something like that, yeah ((*pause*)). That was somebody who was mixing some sauce in a pot, like that, and discussing a deep, philosophical idea with you.

P: Wow!

J: Not bad, huh?

P: Not bad.

J: So then, it was interesting. I found myself moving in the direction of studies of perception. And at first, I was attacked like mad. My colleagues said, "What do you think, there is no reality?" So then, it was interesting…I did a study, you know that one on getting my subjects to reproduce the size of coins of different values, you know? And it came out, and the more valuable the coin, the more it was, the size and something like that, and the way the New York Times is organized, with those boxes at the bottom of the page. An experiment of mine on the front page of the New York Times?

P: Wow! ((*laughing*)) Oh God!

J: So, I mean I was very flattered and so on, but I kept thinking about that, what is there about this? So, I began realizing that this was based on a philosophical point of view that had been greatly suppressed, that others had made an effort, somehow, to bring the constructive element even perception related. In Europe, it was people like von Helmholtz, and in United States, it was William James. And, I remember sitting there in Robbins Library at Harvard reading William James and saying, "Jesus Christ!" ((*laughing*))

P: ((*laughing*)) You're always so funny.

J: You can imagine. I was a kid, maybe I was just turned nineteen and was having these philosophical thoughts that didn't have to do with things in the library. They had to do with my own life. So, psychology was on my mind. At same time…there was also a technique, a method of science, that prevented you from projecting yourself… So, I became fascinated…. The most primitive… the ways of perceiving that it isn't, in our relationship, it isn't that you're pretty, though you are, but the usual stereotype thing like that…It's that you can join attentively in the same kind of thing and that's what opens up, "Ah, there's a promise." So tell me, Professor, what do you mean, promise? So, a world is not only what it is, but what it promises it might be. On with your questions.

P: Aha! My last question was about the most critical point in your life.

J: On the critical point, yeah I don't…Yeah.

P: You don't have any?

J: Well, yeah. I've been through two and a half years of psychoanalysis and ((*long pause*)) one of the things I learned was opening the questions of what we regard as real and what we regard as just subjective and what can transmit ((*long pause*)). Someone once said to me: Jerry I have the feeling that you're more interested in the question than you are in the answer, and there is some truth to that.

P: That is true.

J: Yeah.

P: But, on the other hand what is the most satisfying event in your life?

J: The most satisfactory what?

P: Event, or episode, or experiences you have had. Sailing? ((*laughing*))

J: Sailing? It is an interesting kind of thing, because, some of this has been coming back. I've just been invited to come down to Puerto Rico, to give a lecture. I visited Puerto Rico once. I sailed there from New York.

P: Ah!

J: I was thinking of the way in which my interest in Puerto Rico had to do with the thing, I wanted to see something where the United States was still in control, but where this was not one of the 48 states, that it was independent, and what it was like. So, I sailed my boat down there, and we had a wonderful sail. And the great joke is go on a long sail with Jerry Bruner and his gang. And, it's like having an extra term of graduate school; except, it's turned very personal.

P: So sailing was the most exciting experience in your life.

J: I wouldn't say exciting, in that sense. There was something unknown about the water as I grew up with the row boats and a boat yard right outside my village on long island. And, there was something both promising and threatening about an ocean, about water.

P: I was thinking that sailing is a nice metaphor of life, for a life trajectory.

J: Do I have a metaphor for life?

P: Maybe sailing would fit very well, because in my understanding life or development, it's better to say, development is something that puts yourself in a condition in which an unknown region in front of you while leaving behind you what you already know. Maybe sailing has the same…

J: Getting around the things that hurt too much…

P: I don't know if you can agree with me, but it's a nice metaphor. Our moving in our world is like that; to cope with, to face with the unknown while you're constructing…

J: And to do so along with colleagues, go sailing with others together. It wasn't, I'm not a solo sailor.

P: Ah no?

J: I do it

P: Sure, you can.

J: I can do it fine, yeah. I have the expertise, but that isn't the real thing, I find. It's some ((*long pause*)). The other thing that's nice about it is that there is no material reward except life…I don't know…yeah. ((*long pause*)) I still don't know the answer to the question of sailing…It may have something to do with the fact that I was born blind and ((*pause*)) sailing opened up a range where I didn't have quite to master the conventional way of seeing the world. You can do it from the point of view…global…

P: Go ahead… ((*checking the recorder*)). Just to look if it is still working…it's OK.

J: So, ask me more questions.

P: Ah yeah, I have some more questions. That was about…instead of a question I would tell you one of the most…it's more like an autobiographical note…. When we met the first time… It was in Salerno, and I was waiting for you on the platform. You were arriving from Firenze. I remember very well. It was a hot summer afternoon. I was scared because it was too hot for you as a very New Yorkese, you know? In the middle of summertime, but you were very OK. You just gave a big embrace to me and we started immediately to chat as two old friends. It was a big surprise for me, because you're so accessible.

J: I'm accessible?

P: You're very friendly. But what I learned from you when we started chatting—when we started our correspondence, including our correspondence, and you were so kind to read my paper, to supervise my work—was the following: You said to me, "Pina, nobody can study something that has no relation with our own life." It was something that marked me very much and I was thinking if all your topics, the themes you worked on along your life were in one way or another connected with your own personal life. You many times mentioned your blindness; that you were born blind. So how is this biographical element connected with the themes you have been studying later on? Is there a connection or not?

J: Yeah. ((*long pause*)) It's funny, yeah ((*long pause*)) mhh… ((*touching his face*))

J: There must be. Do I understand them fully? No. But ((*Pause*)) I guess my view is that knowing, getting to know the world, is not just perceiving something; it's constructing it. It's having a conception of time, space…Time, space and also mentality. That is to say, as you ask your questions, I form a sense of your mind, which is a nice sense of, which I rather like, which somehow makes me think that the important thing is exchange in ways of knowing. ((*Referring to the recorder*)) OK? Oh, did I bump that, I shouldn't have done that.

P: It's OK.

J: Yeah ((*pause*)) The great thing about human beings is that, somehow, there isn't a reality out there. There are lots of realities out there, almost as many as there are people. But there comes some point in which we have to bring them together, as they say. And they relate to each other, so that the distinction between psychology and anthropology, that's absurd. I mean, everything I do is anthropology and psychology at the same time. So ((*pause*)) that leads me to a constructivist view: How do we put those two together, which, in turn, seems to have a provoking effect on others. I was mentioning that piece in the New York Times on those coin sizes. I remember saying that, "For Christ's sake, in the New York Times? What makes this so interesting?" ((*expressing surprise in his face*)). So, it's that people take things like the size of objects and all kinds of things like that. I couldn't for a moment, if somebody said, "What do you find attractive about Pina?" I'd make up some kind of story, that you have beautiful eyes …My dear; you know what I mean, yeah. So, what I'd do in the process is to construct *my* Pina. You might say, "Come on, Jerry. That's not me." What is *my* Pina? And so, here we have a world in which we talk about the great power of physics to develop a world which is independent of your subjectivity. Is it? You read the history of physics and you realize the extent to which it is not. And so I have the feeling: don't fix things down, fix things up. Get a sense of that…And it led me first into

the field of perception and the New Look. And, then I started winning prizes. ((*Whispers with the right hand next to the month as he's telling a secret*)) I don't like prizes.

P: ((*Laughs*))

J: And it led me to think, why is this a prize? The other day, there was this thing about…they had a listing of, the ranking of psychologists in the world. Somebody was doing an informal survey. And …came out with, this was about four or five years ago, before Piaget died. Piaget was number one, I was number two ((*expressing doubt in his face*)). Well, what in the world can that mean? I mean, am I trying to be one or two? ((*Laughs*)) I love getting prizes, like the Balzan prize. I particularly like the seventy thousand books that came with it ((*laughs*)). But, I wish I could make all of this clearer.

P: I think…Yeah, sure. Could you…This is my own curiosity. Could you tell us a funny story about Piaget and you? I know you spent a long time in Neuchatel and-

J: In Geneva, yeah.

P: and your story with Russian…with Vygotsky. What is your, "behind the official" story? There is another story behind the official story?

J: Well ((*pause*)) I read Vygotsky, and there were several things involved. One the one hand, I thought the aspirations of communism were wonderful. And, I never knew Vygotsky, but I knew that Russian group Luria particularly, who kind of adopted me as a son. But ((*pause*)) the idea that the characteristic of the world is not its physical steadiness, but the extent to which it's subject to how we construct it, the needs, that we don't have a fixed notion of reality, that my reality is different from your reality. But so what? That makes it all the more fun. And, I've often had the feeling that one of the things that points to this is in the close relation of men and women, that is to say, lovemaking, for example, brings a husband and wife or lovers together in a way that makes you feel ((*touching the top of his head and expressing astonishment*)). There's a reality, but not everybody's reality is the same. And that's what makes the world rich.

P: I love one of your expressions, and I will use it as a subtitle for this book in your honor, "cultivating possibilities." I love this expression, and you use it many times in different situations.

J: It means so much to me, yeah.

P: I think our life is constantly an effort in cultivating new possibilities.

J: Yeah. Possibility is giving a person a sense of the possible. And it's a funny kind of thing, because the great physicists that I've known—As you know, Robert Oppenheimer was a good friend—and Robert said to me once, "Oh, Jerry, you think it's only in psychology? Nonsense. Just as true in physics." To be a good physicist isn't to fix the meaning of things, but open up the possibility of what things might be.

P: Right.

J: Yeah, so it also has some interesting effect on friendships, as to say, I can't remember the details of what we did or talked about or stuff like that, but I have the feeling about you that you're an example of a possible friend that's different

from the others and I'm trying to find out what it is, what it's like… There's some kind of a thing that makes for individual possible ones. And what makes for good friendship; a friend is somebody who has something that is both predictable and unpredictable, and you like both of them.

P: It is.

J: And when I start thinking about how you reform education, that's the sort of thing that did it. So, all of a sudden, within five years… You know what started, what got me into education, when the Russians developed Sputnik, we brought all of our gang together and started thinking, what should physics be? And it turned out to be same thing, that there were lots of physics. Some of them were useful in terms of predicting what we cared about, some ((*pause*)) with who we are. Yeah. So, it's important, I mean, with each one. It's part, the funny thing about it; it's sort of the opposite of physical reality because it has something to do with interpersonal attachment.

P: It is.

J: Yeah. ((*pause*)) Go ahead with your questions.

P: My list of questions was very short. I would like to have your opinion of the future direction for psychology.

J: The future developments for psychology?

P: Yeah. What are we looking for, the big mission for psychology. What do we need to do?

J: Well, there is not one singular thing. We're trying to find out what is individuality, what makes it. At the same time ((*pause*)) what it's like to live …. We could be talking about the novels that we like. It would be just as close, yeah. And sharing narrative, sharing fantasy conceptions and trying to show how those fantasies are not just fantasy. That's also part of the construction of the world, so that—

P: The imagination is—

J: Take that flag over there as a case in point.

P: Yeah

J: That was given to me by the mayor of the Sindaco[3] of Pisa, in Italy. He was a very nice man whose name I've forgotten at the moment. But, he came to one of my lectures and he liked it, and he said, "Professor Bruner, in some ways, you're very Pisano.[4]"

P: ((*Laughs*)) What does it mean?

J: Which made it possible for me, that is to say, I liked the way in which they thought about possibility, and at the same time, had the symbol of the leaning tower that gave a kind of continuity. So, I have little sub-worlds. I have little desire to publish the lead article in Science about my sub-worlds, but I know I couldn't live without them. And they…and it's true, on a grand scale, of writing the history of America, which is a complicated story, and true of the relationship between

[3]Sindaco is an Italian word. It means Major.

[4]Citizen of Pisa.

Pina Marsico and Jerry Bruner that also has a kind of constructed reality that keeps the two of us together. We have words like, "We're very fond of each other." And another thing, too, particularly in the Western, we're very respectful of each other. And if you should now say, "Well, Jerry, what do you mean by respectful?" I'd say, "We'll come to that later." ((*Laughs*))

P: ((*Laughing*)) Yeah. It's a big question.

J: So, where did we first meet … on that platform?

P: Yeah, then you spent with us in Salerno some days. We went to Paestum and we visited the archeological area.

P: In Paestum, near Salerno. There is a nice archeological area with big temples, Greek temples.

J: I remember that.

P: And we went there.

J: That was beautiful, yeah.

P: It was beautiful. It was amazing, and we had a nice conversation about the grandiosity of human beings.

J: About the…

P: The majesty of human beings. How the person and people are able to create some enormous…

J: Yeah.

P: And we felt very proud to be part of human being ((*laughs*)). But at the same time, you started talking at that time of your interest in defending human rights, and your recent work in law in understanding how the law is a constructed version of the world, is not an axiomatic thing. It was very interesting for us.

J: The deeply interesting thing was the constructed aspect of the thing, that what we're doing here is some joint construction of the world.

P: Just to conclude, Jerry. Moving on to other topics, I really appreciate always not only the content of your work, but also the style in which you write your work. And the one thing you said to me the first time you read my paper, you said, "Pina, you have to find your own style in writing." And it's very interesting, nowadays in psychology in which there is a sort of homogeneity, uniformity in writing, and all the people follow in the same rules and the same mainstream psychology that is… So, it was a big message from you, and I guess it was one of the big interesting messages you sent to me as a young scholar, as well as to search for the topics that have a bigger impact on my own life, and I'm working on borders, you know I'm interested in borders. So, that's all; nothing more than that. And I would like to conclude just remembering one of your sentences, when you talk about your students. You say, "I don't honor my students for echoing me back. I want to find out where they are going to take the idea next." I think that is really extremely important from you and extremely generous from you. You are curious to see where your idea pushes further, moves further from you.

J: I'm converting the ideas that come out of my relations with somebody. Yeah. ((*about the recorder*)) Did it give out?

P: The recorder is stopped, so thank you so much for your kindness. Let us continue our conversation without this device.

J: Yeah.
P: Thank you very much, Jerry. Thanks a lot.

Clark Lecture in 1968 "Processes of Cognitive Growth: Infancy"

Jerome S. Bruner

Introduction

Distinguished colleagues, ladies and gentlemen. I am deeply honored and personally moved to be the Heinz Werner Lecturer. For Heinz Werner was a man whose stature and purpose give dignity and substance to the study of development. He was a daring man who combined the insights of anthropology, biology, and psychology in his studies of the nature of development, one of those rare psychologists who took it as a working tenet that man had a mind but also a body that mattered, and lived in a society that mattered. Heinz Werner delighted to teach and to discuss. Although I was, so to speak, never duly enrolled, I was often the beneficiary of his teaching and his discussion. He was a quarter century my senior. He made us all feel like comrades of the quest. I am honored to be at Clark again, helping to keep lively the memory of this great and generous man.

Let me say a word at the outset concerning the plan of these two lectures. Originally, I had hoped to give over the first lecture to human infancy—roughly the period from birth to the appearance of rule-bound grammatical discourse at about two years of age. In the second lecture, we were to turn to the nature of cognitive development in childhood, rather arbitrarily setting the upper limit at the age of puberty. I am, at this juncture, actively involved in research on infancy. You will forgive me if my original resolve failed me. Both lectures will deal with infancy and what kind of prolegomenon to human life it is.

* * *

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Like Heinz Werner, I take it as a working premise that growth cannot be understood without reference to human culture and to primate evolution. Human beings, uniquely among species, grow in a fashion that permits them to participate in human culture, to use its language, its kinship system, its technological way of organizing work. As Lévi-Strauss (1963) has pointed out, the base structure of culture involves three forms of exchange: of symbols through language, of mates through human kinship, and of artificial goods and services through economy—all species-specific to *Homo sapiens.* I believe all three of them are supported by powerful biological predispositions, shaped in the course of primate evolution. Plainly, there is an important innate component in language acquisition (e.g., Lenneberg 1967; McNeill 1966) quite unlike anything to be observed in the primate series (compare the closely studied communication system of the *macaque,* Rowell and Hinde 1962). There may be a beginning among the great apes of a mutuality and exchange that presages human kinship. But in humans, the pattern reaches its classificatory form supported by language and reinforced further by such new and stable patterns of mother-infant interaction as eye-to-eye contact and mutual smiling (cf. Robson 1967 and Freedman et al. 1967). Finally, there appears to be as well an innate capacity for tool-using and tool-making that is the fruit of a long and detailed set of evolutionary changes such as increasing bipedalism, differentiation of power and precision grip, more ductile phalanges, increased and less mediated neural representation for the hands and fingers. Man's biological endowment and his position in primate evolution surely predispose him to the use of culture. His growth from infancy to adulthood reflects that predisposition.

This is not a proposal for a new teleology. I know that the danger of concerning oneself with the terminus of growth or evolution is that we assert covertly that the terminus *causes* growth to go in the direction it does. That would be an unpardonable teleology. Let me plead for a pardonable and heuristic one that asserts, simply and for convenience, that it helps to understand a course of growth if one knows where it is leading. Interestingly enough, such a teleology-of-convenience, the kind of workaday tacit assumption of most biologists, withers away as one gets a better sense of the mechanisms and processes involved in growth.

Let it he clear, however, that there are detailed consequences that ensue from an emphasis upon the terminus of growth. One, which we shall meet again in discussing the ontogenesis of the intelligent use of the hands, has to do with certain pre-adaptive structures that must he present in the child's behavioral repertory in order for his development to go in the direction it finally takes. However much experience is necessary for growth, the experience writes on a slate that is plainly predisposed to accept some messages more readily than others, the predispositions reflecting a long evolutionary history.

The existence of species-specific human behavior, moreover, should not obscure the fact that human intelligence and perception, while characteristically human, represent continuities of primate evolution from prosimians through the early hominids from which *Homo sapiens* emerged. Professor LeGros Clark (1963) is very compelling in his analysis of this continuity. There is a long trend toward increased dependence upon distance receptors, with specialization of the brain for processing information from these receptors that is crucial to an understanding of man's ways

of mapping an enlarged environment. Similarly, the emergence of a sharply defined distinction between power grip and precision grip and of the functional-anatomical asymmetry of the hands has a long primate history, itself strongly influenced by the slow emergence of bipedalism. Man’s capacity as a tool-user as we have noted, is hard to imagine without that history. Indeed, my colleague Trevarthen (1968) would urge upon us that the strong differentiation of a two-aspect visual system, the one focal, refined and identity-sensitive, the other ambient and sensitive to location and movement, is itself a resultant of primate evolution.

So in considering the early life of a member of our own species, it helps to bear in mind not only what the infant and child are developing *towards*, but also what they have developed *from.* But just as one must caution against future-state teleology, so one properly guards lest the evolutionary past lead one to a causal historical determinism. One cannot “explain” the development of human manipulatory behavior either by reference to its terminus in tool-using or by reference to the undisputed fact that it reflects patterns observed earlier in the primate series. Yet both forms of reference provide a working perspective. Without either of them, a developmental theory risks being sterile.

* * *

The research upon which we shall focus in these lectures is designed to elucidate four great issues in human infancy. It is research very much in progress, and there are few definitive answers to he given. It is nonetheless better, I think, to explore these issues in the context of this incomplete research so that they may be operationally tangible. The four great issues are these.

1. Through what processes does voluntary control of behavior develop? Obviously, voluntary control implies several highly specific forms of mastery. For one thing, it implies anticipation of a goal or an outcome and the choice of a means for achieving that goal. It implies, moreover, a certain freedom from immediate sensory control of behavior. Voluntary control also implies a capacity to sustain a direction of behavior longer than a single response, and the issue of sequential organization of responses must be faced. Finally, voluntary behavior implies skill: the ability to mobilize the intended response. In the very young infant, one finds none or critically few of these; there is imperfect anticipation, reflex response rather than choice of means, domination by stimuli, short-term acts to such a degree that it is difficult in a practical sense to know when longer acts begin or end. Finally, there is an absence of virtually all skills save in the oculomotor apparatus and in nutritional activity, principally sucking, of which more later. How, then, does the child grow in the course of a year from this helpless state to one in which he has such an effective capacity for voluntary control?
2. Through what means does the child gain control of his own attention? Put in another way: How does the child learn to orient in a way that reflects the needs of search and problem-solving rather than the mere tracking of sensory change? Inevitably, this must involve the infant’s ability to represent his environment, to form a record of where things are and what uses they may serve. Such early representation—particularly the child’s use in representation

of equivalence and identity rules—is a matter of some difference between Cambridge and Geneva, as those of you know who heard Professor Piaget's (1968), brilliant lectures here last year.

3. Through what form of learning does the infant progress from being a "one-track" enterprise, capable seemingly of one activity at a time, to a capacity for carrying out several lines of activity jointly or synergically? By the end of a year, there is little question that the infant is capable of doing things that are "parentheses within parentheses." How is this essential hierarchical embedding achieved?
4. Finally, how does the infant manage to begin a career of reciprocation and exchange that prepares him in such a degree for culture using in general and language using in particular?

We have been sampling, in our research, four activities better to understand the growth of voluntary control, the internalization of attention, the intercalation of several enterprises, and the mastering of reciprocity rules. All are crucial to the child's existence; all go through cataclysmic changes during the first year. They are feeding (notably sucking), looking, manipulating, and interacting with an adult.

Before we turn to these matters concretely, consider first the possible functions of infancy in the life cycle of the human being. Let me suggest three. One striking thing about human infancy is that the infant sensory apparatus yields information far beyond the capacity of the motor apparatus to use it. Before the child is able even to hold up bis head, his eye movements can be shown to be highly discriminating (e.g., Kessen 1967). The bases for size constancy seem well developed at six weeks though the infant can neither reach out nor locomote (Bower 1966). Does the damped down motor system make it possible for sensory scanning to occur without the establishment of precocious habit? Closely related to this asymmetry of motor and sensory systems is a second fact: that the motor system, notably the part given to manipulation, is designed with far more degrees of freedom for movement than the infant can control for years. Early manipulation thus requires strategies for controlling these excess degrees of freedom. Later, tools again add more degrees of freedom to manipulation. But in an interesting way, they may represent a continuity with the way we master our own manipulatory behavior using only our own limbs. Finally, there is an extraordinary degree of dependency upon parental aid in the human infant in comparison with other primates. The hair-grasping reflexes (and the hair!) are gone, or virtually so. Given this dependence, there is a surprisingly primitive communications system with very little built into it at the outset. Communication, then, must be learned and must depend upon a reciprocal code that precedes language proper.

The net result of all this is, first, a prolonged period of scanning the environment without early motor commitment, so that the structure of space can be elaborated autonomously of action. I realize that it is not freely independent of action and that action helps shape it. Rather, I am speaking relatively. There is, second, a very slow process of motor mastery so that, after the dissolution of the

first reflexive patterns discussed by Twitchell (1965), McGraw (1943), and others, there is required a succession of strategies for coping with excess degrees of freedom. This is the origin of human infantile clumsiness, and I shall argue that it serves an important role in the growth of uniquely human, tool-assisted skill. Finally, there is in human infancy a prolonged dependence upon adult tutelage and shaping, based on exchange of reciprocal signaling and interaction. In a word, human infancy appears to be a guarantor against the achievement of precocities of development, a period in which very general rules of skill, of perceptual organization, and of interaction are learned in preparation for later, species-specific forms of human achievement in action, perception, and communication. In this sense, infancy can be conceived almost as a shield against premature specialization.

* * *

The Integration of Multiple Activities

Consider first the growth of feeding and sucking. What light can they shed on the critical issues with which we began our discussion? Let me begin by recalling some of the facts of sucking and the role of the mouth in early infancy.

Sucking serves several functions. It can be observed as early as the third gestational month (Peiper 1963). Though it is instinctive, it requires some priming to get started in the neonate, as we know from the work of Gunther (1961), and if not early exercised, may become difficult to evoke. At birth the infant may have certain difficulties beginning to suck, grinding jaws back and forth, missing the pressure, etc. Once he has “connected,” so to speak, and I have observed as many as four five-second periods of trying before he does, the sucking is immediately highly expert. Sucking in very early infancy is with corners of the mouth shut, eyes usually shut, and with uniform pressure throughout the buccal cavity.

In addition to its role in feeding, sucking occurs non-nutritively, and the studies of Jensen (1932) and Wolff and Simmons (1967) indicate that this may serve either an antidistractant or analgesic function or both. Pin pricks and tickling of the face by a feather increase the sucking rate or lead to initiation of sucking. Indeed, it is now standard practice in some hospitals to carry out circumcision while the child is sucking on a favored pacifier. While relieving distress, sucking also inhibits the newborn infant’s level of general activity (Kessen and Leutzendorff 1963), with effective suckers showing the greatest quietening (Kessen 1967). A variety of studies indicate that infants suck non-nutritively at about a con stant individual rate of 48–80/min whether hungry or not (Balint 1948; Bridger 1962). But at the same time, non-nutritive sucking has been shown to vary in rate as a function of the nature of the object provided for sucking—a nipple producing a better output than a polyethylene tube of comparable gauge (Lipsitt and Kaye 1964). The third function of the mouth is for exploration, and its importance in the organization of behavior will concern us shortly.

The mouth, from the start, is embedded functionally in several systems. For one thing, it is the aiming point in the head-turning system. A touch to the edge of the jaw or the side of the cheek will produce a rooting reflex with mouth moved toward the touch. It is also mapped into the arm-and-trunk system, as indicated by the Babkin and the palmomental reflexes; pressing the palm will produce mouth movements in the newborn, as will pressure on the ball at the base of the thumb produce contractions in the mentalis muscle of the jaw.

Now consider a few observations. The first has to do with the nature of the flexibility and voluntary control that gradually permeates this originally quite reflexive system of sucking. While, at the outset, sucking has a very compulsive property, closer examination of it shows in what measure it is, even in the first day of life, quite sensitive to changes in the environment that relate to it. A word about how one records sucking. Figure 1 provides a diagrammatic sketch of the system. It provides a means of measuring suctioning pressure on a polygraph, as well as the positive pressure of mouthing and pressing the nipple with the gums and tongue. At the same time we are enabled to deliver milk directly through the nipple to the baby in response either to positive or negative sucking or to some combination, and with what-ever contingency we choose. For not only does a record of the baby's sucking register on a polygraph, but also on a programming device that can be set to activate a milk-pulsing system each time the baby sucks in a specified way, every other time, etc. or at specified intervals of time after the baby has sucked. The device builds upon similar devices that have been used in recent years by kron et al. (1963) and by Sameroff (1965). Complicated though the instrument may seem in the context of infancy as lived, it is quite indistinguishable from an ordinary nursing bottle to the infant and mother, as Fig. 2 indicates.

Nutritional sucking is surprisingly flexible. Sameroff (1965) has shown in the neonate that when milk is delivered exclusively for mouthing, the negative

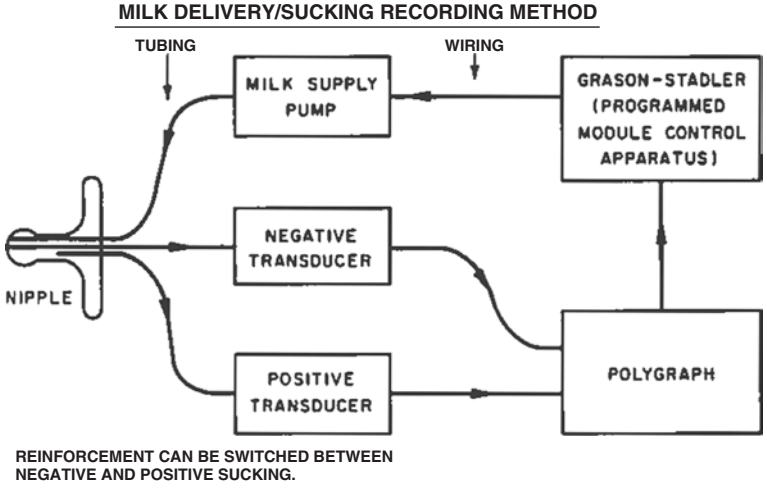

Fig. 1 Diagram of sucking apparatus

Fig. 2 Mother and infant with bottle part of sucking apparatus

or suctioning component will diminish. Indeed, if one establishes a certain level of required mouthing pressure to get milk, the infant within a minute or two will adapt to that level. But the adaptation will not carry over to the next feeding. The infant will begin anew at his own “natural” or signature level of pressure (or with mouthing and suctioning at original level). In our own laboratory, working with children a month of age or older, Hillman finds that over a session of fifteen minutes, suctioning will virtually drop out if mouthing alone produces milk. In subsequent sessions, though the infant begins with no sign of adaptation, he may more quickly adapt to the demands for mouthing rather than suctioning.

In another part of Hillman's experiment the child receives a pulse of his own formula milk at the end of a second if there has been any sucking during that second, or at the end of every two seconds if sucking has occurred in the two-second period. The learning that ensues is very interesting indeed, being much more akin to strategy-learning than to specific response acquisition. When a pulse of milk is delivered each second or every two seconds in which a suck has occurred, the effect on some babies is to shorten their sucking bursts. As you know, non-nutritive sucking and then nutritive sucking develop a burst-and-pause pattern, and usually by a month, there is a typical pattern of a burst of from eight to fifteen sucks followed by a pause that would correspond to some four or five sucks as illustrated in Fig. 3. In response to fixed-interval milk delivery, some twelve-week-olds will shorten their bursts of sucks and increase their pauses (Fig. 4). This abortive attempt at solution indicates a sensitivity to a changed feature of the environment with a highly general "response" or adaptation. The child appears to be learning some such rule as increasing the number of starts and stops—that starting anew may produce results. If the situation reaches limits that the infant clearly cannot cope with—as often happens with a two-second interval before milk delivery—then the subtle modulation of the infant's behavior may be disrupted by crying or, seemingly in frustration, he will shift back to his usual pattern of bursts and pauses. Such strategic adaptation seems to occur only with moderate deviations from expected environmental states. When the environment exceeds acceptable limits, the behavior goes back to a highly developed preadaptive pattern.

Another way of approaching the "voluntarization" and adaptability of sucking is to observe the extent to which it can be integrated with other higher-order activities. "Normal" sucking, we know from observations by Kessen (1967) and Wolff (1968), can he observed in brain stem infants. What does it take to intercalate this primitive activity with such a higher order information processing system as visual scanning? Let me report some of our own observations, again with the proviso that it is a report of work in progress. Kalnins and I have noted the following sequence.

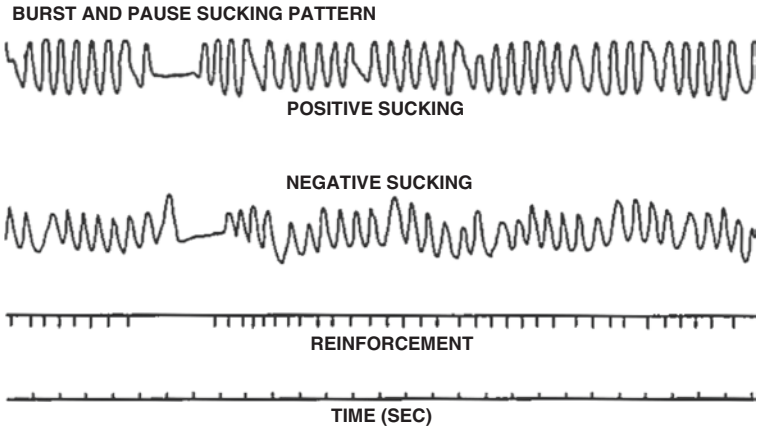

Fig. 3 Burst-and-pause sucking pattern at thirteen weeks

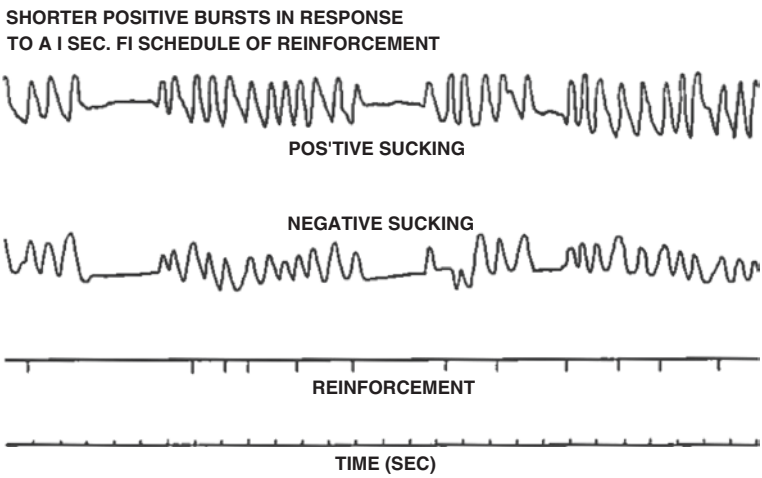

Fig. 4 Shorter bursts and longer pauses in a fixed-interval delivery of milk at thirteen weeks

At birth, and for some days after, the infant sucks with eyes tight shut. If the infant looks, tracks, or listens, sucking is disrupted—indeed, the disruption has been used as a measure of attending, as in the classic study by Bronshtein and Petrova (1967). With the three- to five-week-old baby, the eyes may be open while sucking, but there is a high likelihood that when fixation or tracking occurs, sucking stops. It may well be that, in Trevarthen’s terms (1968), if the focal rather than the ambient visual system is brought into play, sucking stops.

There is a new pattern by nine or thirteen weeks at the latest. And note that these timetable figures may be a little parochial, for they deal in the main with infants of middle-class parents interested enough in child rearing to come to our laboratory. The child now sucks in bursts, and looks during pauses. He may remain generally oriented toward the source of stimulation while sucking, but not fixated and never showing the “caught” or locked-on gaze while sucking. Around this age, three months, a stimulus change occurring during a sucking burst will disrupt the burst or bring it to an end sooner. But if the stimulus is presented during a pause, it will have no effect on subsequent bursts (compare Figs. 5 and 6). It appears that the pauses are being used to process information, a matter that we shall wish to investigate much more thoroughly before letting it rest at that.

Finally, usually before four months and often as early as two months, the baby appears to be able to suck and look at once. But when one examines the sucking record, it turns out not to be the case. For now, the act of looking inhibits negative sucking or suctioning, while mouthing or positive sucking goes right on through, though with reduced amplitude (Fig. 7). It is this phenomenon, at first so puzzling to us, that first made us suspect what we think to he a form of externalized enterprise maintenance that for the moment we refer to as *place holding.* By maintaining some feature of an ongoing act in operation while carrying out some other act in parentheses, one is reminded that the original act is to be resumed. We shall meet it again later.

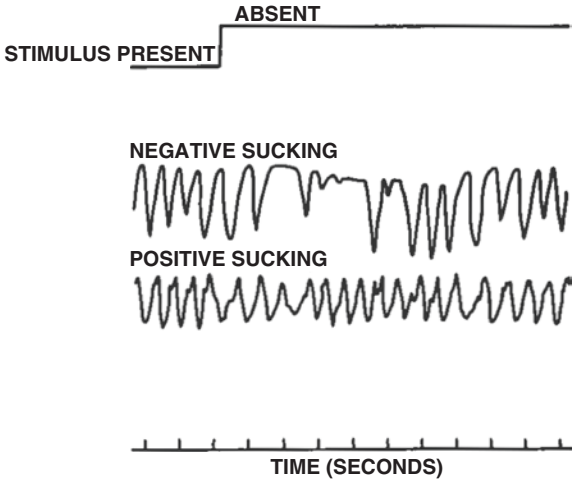

Fig. 5 Disruption of negative sucking with stimulus change during sucking burst

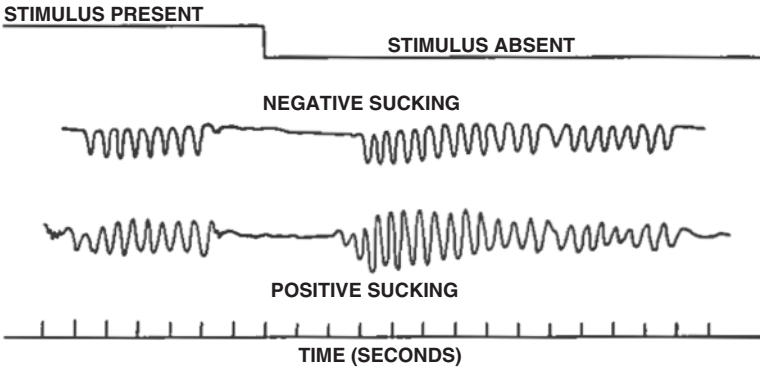

Fig. 6 Absence of any disruption of sucking in an eight-week-old infant when stimulus disappears during a pause

One can summarize the relation between sucking and looking by noting that it goes through three phases in its growth. The first is *suppression* of one by the other—and mostly it is looking that suppresses sucking. The second phase is simple succession of sucking and looking, organization by alternation. The third phase is *place holding,* in which the two acts can go on, with one in reduced form that is sufficient for easy resumption, while the other goes into full operation.

One suspects, on the basis of these observations—and a stronger conclusion is not yet warranted—that this decreasing preemption by the act of sucking is part of a broader pattern involving a general decrease in one-trackedness of behavior. In considering the decreased preemptiveness of sucking, bear in mind that the mouth is also involved in what is properly called the epistemic function—exploring. To the degree that it is linked to nutrition and distress reduction, it is not available for

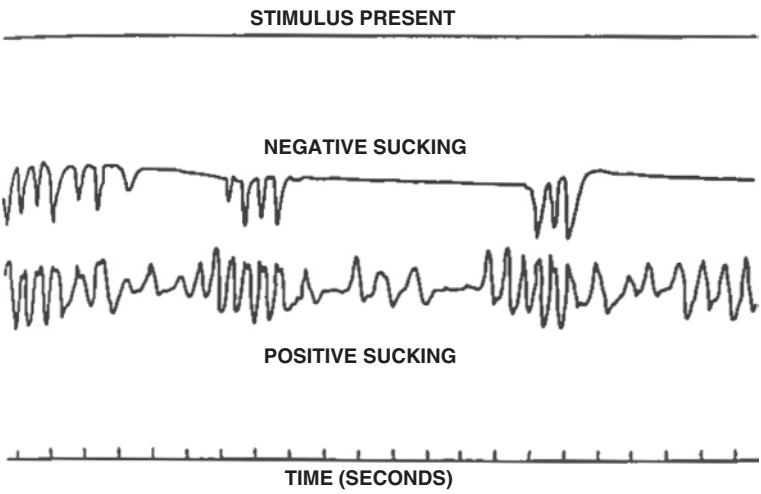

Fig. 7 Positive sucking being used as “place holder” during disruption of negative sucking by a stimulus

exploration. Jolly’s (1966) careful work on lemurs, who show more dependence on the mouth than on the fingers for adult exploration, suggests that the mouth in exploration is never freed entirely from its nutritional function. Yet, from the start of human infancy, a good visual stimulus, concentrically organized and sharply contoured, will have the effect of inhibiting sucking altogether, suggesting that the epistemic needs of the newborn organism are not completely swamped by the need for food and comfort.

This brings us directly to a final experiment concerned with the nature of sucking, this time sucking in the interest of a quite arbitrary goal. We can properly argue that one of the features of voluntary control of an action system is the degree to which it can be utilized as a means to a new end. We had been impressed by experiments conducted by Siqueland (1968) at Brown indicating that infants of three months were quite capable of sucking to increase the illumination of a picture on a backlighted screen in an otherwise darkened room. In an experiment in progress, Kalnins has altered this procedure in one crucial respect to assure that what was involved was not the preference of the young child for a lighted environment. In her procedure, her infants varying from one month through three months in age are shown a picture that is initially out of focus on a large and close backlighted screen. By sucking on a pacifier, the child can bring the picture into focus. If the distance from out-of-focus to in-focus be arbitrarily assigned the value of one clair, then each suck by the child im proves the focus by .16 clair, and six sucks bring the picture into full focus. If sucking should fall below the rate of one per two seconds, the picture starts out of focus. The brightness remains virtually constant throughout. In a control condition, the picture is in focus, and sucking drives it out of focus at the rate mentioned above. Refraining from sucking at the prescribed rate lets the picture come back into focus.

First let me say that a six-week infant can in fact learn to suck to bring the picture into focus and to desist somewhat when his sucking blurs the display. Infants plainly will work for visual clarity. What is especially interesting is how the child learns to *coordinate* the two ordinarily independent activities of sucking and looking. Let me bypass differences in age, since these are not yet resolved by the study. What is already quite plain is that the learning functions for the two activities do not run parallel. For one thing, the six-week-old may typically learn first to suck the picture into focus, but the moment it is in focus, sucking is inhibited by looking and the picture is allowed back out of focus. This dilemma may be resolved by sucking without looking until the picture is in focus, then looking and sucking for a brief period. When he stops sucking and the picture starts blurring, he immediately averts his gaze. Gradually the amount of time during which he can suck and look increases. The child seems to be learning not so much a *specific* response, but rather a sequentially organized, adaptive strategy of responses.

There is in infant sucking, to sum up, an early present and soon modified capacity for adaptation. Human sucking, for all its primitive origin in mammals, adapts from the start to the shape and tempo of nutritive sources. It is anticipatory from the beginning, and from the start moves toward a state in which it can be fitted into multiple enterprises. The course of its integration with other activities can be described in three phases: suppression, alternating succession, and place holding—steps toward the achievement of a genuine hierarchical ordering of multiple activities. Indeed, before the third month of life, there is ample indication that the activity of sucking not only serves innately predetermined multiple functions—nutrition, pain reduction, and exploration—but that it can also be diverted to arbitrary and intelligent instrumental activity that could not possibly have been preordained by evolution.

Volition, Skill, and Tools

We come now to the development of the intelligent use of the hands. It is a much neglected topic—perhaps because we professors are intellectuals who are more preoccupied with words and images and ideas than with tools and tool-making. Yet, one cannot go far into prehistory (e.g., Burkitt 1963; Oakley 1960; Buettner-Janusch 1966) without being impressed by the role of "clever hands" in human evolution. Yet very little has been written about "manual intelligence." The gifted Russian neurophysiologist Bernstein (1967) poses the problem well in discussing the physiology of activity:

> … a first requisite for the programming of any activity is the formulation of motor problems, or problems of action (in terms of codes as yet unknown to us) and this latter process is based on a modelling of the future by the organism. In this case the model made by the brain is not merely an extra polation of observed variations in the immediate surroundings of the organism, but it is essentially a model of the *future requirements of the individual,* a model of that which is not yet, *but which must he the case.* The basis for this model

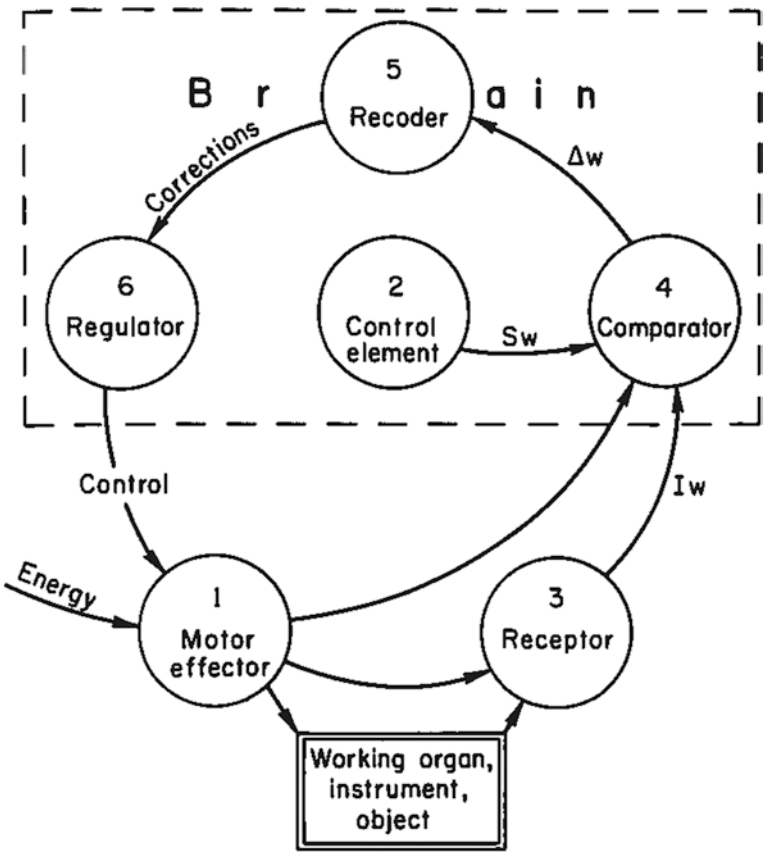

Fig. 8 N. Bernstein’s model for a system capable of voluntary activity directed toward objects or states of the environment (from Bernstein 1967)

> of the process of programming an action which is to be brought to realization most closely resembles *an interpolation* between the current moment of time t and the state of affairs at a moment some period Δt in the future, which is modelled in the brain (pp. 186–187).

Bernstein’s proposal for a minimum system capable of effecting such voluntary control of activity is indicated in Fig. 8.*[1]

Note that *activity* contrasts with mere *movement* in that the former requires the coordination and regulation of the latter *in the attainment of some particular objective.* A ball is to be thrown a certain distance and has a certain weight, or a screwdriver to be turned requires the application through the hand and arm of a certain torque. Again, to quote from Bernstein (1967):

[1]The reader will find comparable models proposed for some-what different aspects of intelligent behavior, by Ashby (1952), von Holst and Mittelstaedt (1950), Miller et al. (1960), Gregory (1966), Held (1965), MacKay (1966), and others. We choose the Bernstein variant since it is more adaptable, hopefully, to problems of voluntary action and its development.

All systems that are self-regulating for any given parameter, constant or variable, must incorporate the following elements as minimum requirements:

(1) *effector* (motor) activity, which is to be regulated along the given parameter,
(2) *a control element* which conveys to the system in one way or another the *required value* of the parameter which is to be regulated,
(3) *a receptor* which perceives the *factual* course of the *value* of the parameter and signals it by some means to
(4) *a comparator device* which perceives the discrepancy between the *factual* and *required* values with its magnitude and sign,
(5) an apparatus which recodes the data provided by the comparator device into correctional impulses which are transmitted by feedback linkages to
(6) *a regulator* which controls the function of the *effector* along the given parameter.

For Bernstein, finally, the achievement of control always involves a reduction of or "mastery" over degrees of freedom in the action-system being regulated. There are joints and tendons in fingers, wrists, elbows, shoulders, and trunk that can operate independently of each other. A hammer or a screwdriver or a thrown ball can slip this way or that. The system without a highly intelligent control, or without locking off some of its flapping, can be very noisy indeed. Let me propose two ways that control over degrees of freedom in directed activity can be effected: one is through the development of sequentially organized skill; the other is through brute limitation or restriction, as when one uses the arm with elbow locked almost as a sweep.

I shall argue in what follows that the mastery of intelligent, visually-guided manipulation in infancy and childhood involves precisely a cycle of brute restriction of movement and of skill formation within the limits of that restriction, with skill moving to a next step only when restriction is altered. Any *given* program of skilled voluntary action is gradually consolidated within its own restrictions. Its consolidation is signaled by the well-known plateau in the learning curve. Progress points in the infant's development are qualitative rather than quantitative changes of skill. These involve not consolidation but the formulation of new strategies of action which in turn must be consolidated. Each new program of action involves an increment of degrees of freedom. The process, moreover, continues throughout life. The difference between "good skiing" and "bad skiing" is, alas, qualitative.*[2]

What leads to the qualitative shift in strategy when there is a leap forward in skill? Bernstein proposes that it comes after sufficient practice with the variant

[2]In the classic study of Morse code transmission by Bryan and Harter (1899), the telegrapher shows a series of increments in speed, followed by plateaus. He begins with single letter units (of which there is some multiple of 10^1), and reaches a plateau. Then he starts up again, organizing in terms of words (of which there is some working multiple of 10^3), and hits a plateau. He then goes to phrases (of which there must be some multiple of 10^6). In each case, the number of degrees of freedom increases by orders of magnitude.

versions of a particular skill strategy. I would agree with this, and add a speculation. The practice of variants of a skilled act is, in effect, practice with instances of a concept. I suspect that when an act can he more easily reduced to a conceptual rule, with attendant reduction in the strain of information processing, we are then ready to tackle more complicated motor problems.

Let me say a word about Fig. 8, for its terms will be useful in examining observations on the growth of directed reaching in infancy to which we shall turn. About the sensor or receptor, first, we need only remark that there is a long line of research that shows the enormous importance of sensory information in voluntary activity. The classic experiment of Mott and Sherrington (1895) was the first to show that if a monkey’s arm be deafferented by section of the appropriate dorsal roots of the cervical and thoracic outflow of the spinal cord, the animal’s limb becomes, in effect, paralyzed as well as anesthetized. As in the earlier experiment, Twitchell’s (1954) and Lassek’s (1948) repetition confirmed that in a free situation the operated animals did not use the deafferented forelimb. But interestingly enough, Knapp et al. (1963) have shown that monkeys are able to perform a conditioned avoidance response after deafferentation of the limb, or indeed were able to acquire a new conditioned avoidance response with the limb. There are various interpretations one can put on this important experiment. There is a long distance between *spontaneous* use of the hand in *voluntary* behavior and a conditioned avoidance response involving the removal of the hand from danger of shock at the sounding of a buzzer. Conditioned avoidance is supported by an external, evoking stimulus; spontaneous use of the hand in goal-directed, instrumental behavior involves internal signaling with the type of corollary discharge that Teuber (1966) has recently proposed as the neural hallmark of consciousness. The corollary discharge, of course, is the S_w of the Bernstein diagram, the *Sollwert* or required value which, taken by the comparator along with the *Istwert,* the I_w, yields Δ_w that is then recoded for correction of effector activity. A conditioned avoidance stimulus apparently is able to evoke an action order, where spontaneous effort cannot—which should give us pause in our reductionism!

Let me turn now to observations on infant reaching. In the early weeks the child is capable of several highly organized forms of reflex grasping that are evoked by quite specific tactual or proprioceptive stimuli. These reflex patterns have recently been described with great care by Twitchell (1965). At birth, but usually gone by the end of the second month, there is a “traction response” of the arm and hand, a proprioceptively elicited hand flexion produced by stretch of shoulder adductors and arm flexors. It is not produced by contact but only by stretch. At about four weeks, the “grasp reflex” proper makes its appearance. It involves a catching and a holding of the contacted object. A distally moving contact stimulus between forefinger and thumb initially evokes abduction of those two digits. Later, the reflex spreads to the other fingers and the whole hand. It can be produced only by contact. At about four or five months, there begins the more interesting “instinctive grasp reaction” (I am using Twitchell’s terminology throughout). A light contact on ulnar or radial side of the hand produces now a groping toward the object with appropriate pronation or supination for orienting and hunting. If appropriate

contact is made with an object, then grasp proper occurs. The grasping-groping reaction is initially quite independent of vision and is elicited by a light touch alone even with the baby's gaze averted. To this list should be added as well the tonic neck reflex involving the child in the fencer's posture, a gross pattern involving the arms and trunk that gradually fades in its sharpness during the first year although remnants of it may be found in adult sleep postures.

The role of these reflexes in visually-controlled, voluntary reaching is a moot point. The growth of visually-guided reaching has been carefully described by Halverson (1931), by McGravv (1943), by Piaget (1952), by White et al. (1964), all for somewhat different reasons and at different ages. Piaget Was attempting to reconstruct the development of sensorimotor schemata. McGraw proposed to verify the view that cortical control was critical—though Conel's anatomical (1939–1963) studies have indicated that the cortical representation of the hand grows at the fastest rate of any part of the brain during the first month of life. Halverson, like others in the Gesell group, was trying to give a normative picture of the maturational unfolding of the infant's voluntary manual activity. White, Castle, and Held were exploring the sources of plasticity in behavior. Whereas Piaget and the Held group were principally concerned with the period from one month to four or five months, Halverson began at four and a half months. Most of the studies were done with infants lying supine. The reaching pattern of the supine infant, we have reason to believe, is quite different from that of the infant in a semi-upright, supported position where the hands are free to reach forward and explore.

In any case, this is not the place to sort out the strands of these various, often excellent observational studies. Only a few points need be made preparatory to considering voluntary control in the light of the model proposed. It is plain from the conclusive work of Held and his associates that the earlier views concerning "maturational unfolding'' unaffected by the environment are just as false as the view which states that it is *only* through opportunity for interaction with the environment that control develops. The burden of these studies is that visual deprivation of primates, particularly the lack of an opportunity to observe their own hands, severely limits hand-eye coordination as well as voluntary control of the manipulatory system. Certainly Piaget's view of the role of action and its feedback into a sensorimotor schema has been well supported. But it is also quite plain that once Held's deprived monkeys are given the opportunity to use and view both their hands, there is a very swift restoration of normal functioning, no matter how clumsy the initial efforts of the deprived animals might be. The work of Alt (1968) and of Trevarthen and Richards (in preparation) in our own laboratory suggests to what extent there is a considerable amount of preadaptive sensorimotor organization ready to be activated by experience in the visually-guided use of the hands. Alt has shown that the naive infant does *not* have to watch his hand while reaching for an object. He did this by placing an occluding screen so that the child could see the object being reached for, but not his hand. Trevarthen and Richards are describing in detail the extent to which the child's initial swiping and reaching out is seemingly controlled by an adequate model of "behavioral-visual" space, even without experience. So, quite plainly, visual experience of the hands matters, but

its effect is dependent upon the existence of preadaptive structures that make possible a comparison of what is intended in an activity, and what is accomplished—the operation of a comparator that can yield Δ_w from a discrepancy between S_w and I_w.

Twitchell (1965) argues that in development, voluntary control rests upon a substratum of reflex activity and often it takes the initial form of self-evocation of the reflex in question, much as in the recovery patterns of hemiplegics. Piaget’s conception of interaction between response (however evoked) and environmental feedback providing a sensorimotor schema is a quite irresistible solution. As Bernstein would put it, the existence of a guided response has all the elements necessary for a “motor problem” and the neural apparatus described in Fig. 8 can be brought into play.

But to let the matter rest there misses one crucial aspect of voluntary activity—its volitional component. There is much about the earliest voluntary activity that is *precisely without* the aid of the prepared reflex mechanisms, a kind of unskilled expression of voluntary action without an appropriate program for limiting the large number of degrees of freedom of the trunk, arms, head, and hands. This *undifferentiated* voluntary action takes the form of diffuse activation and the movements that result are far more akin to athetosis than to organized reflex activity. These are preskilled and precoordinated forms of voluntary action. It is *after* the infant has abandoned the reflex pattern of response, and after a period of diffuse athetoid activity, that *directed voluntary activity* begins. Indeed, this more diffuse activity of orienting toward objects with intense preoccupation and antigravitational movement of the arms and trunk (around four months) is probably to be taken as a sign of growth. Now consider some particulars.

In our observations, infants between the ages of one and eight months are seated in a specially designed chair, leaning 30° back from the upright. They are held steady by an elastic belly band that passes through the legs to the seat, and by a loosely attached chest band passing under the arms, which gives support if the child leans forward, and also prevents him from falling to either side. Figure 9 illustrates an infant in such a seat. It appears to be reasonably comfortable, for infants will sit as subjects in visual experiments involving moving images for as long as a half hour with no signs of fretting.*[3]

The course of “reaching” can be sketched briefly here. At a month, as White et al. (1964) have noted, a peripherally-moving stimulus will cause the child to move his head in pursuit, and as the object approaches he will change in general activity—becoming quieter if active before, or more active if quiet before. As the object moves into the range of good accommodation, there tends to be a heightening of tension in the trunk, which by six weeks takes the form of antigravitational activity in the shoulders and flexion of the arms. By ten or twelve weeks, the approach of the object, as it moves from “spectator space” into “participant space”

[3]Much of our apparatus for recording responses and presenting stimuli was designed by Mr. Andrew Marshall, III, to whom we are very grateful. We are indebted to Mr. Robert Howe for his skill and patience in helping us design various infant seats, saddles, and supports.

Fig. 9 Infant in seat used for reaching experiments

(between eighteen and twelve inches) produces "pumping up" behavior of arms, shoulders, and head, with fixated gaze and actively working mouth. From this position, there may be launched the well-known swiping movements, with fisted hand moving ballistically in the general direction of the object. I have seen babies blink with a slight startle when the swipe occurred. It is as if the "connection" between the willed act and the execution were unexpected.

At about three and one-half months to four and one-half months, there is finally sufficient mastery of the situation so that activation is less explosive, and there occurs a slow reach toward the fixated object with hand wide open and, often, with mouth and tongue working. If bilateral, the reach closes on the object at the midline, the widespread hands closing only when there is contact with the object. If the reach is unilateral, then the "unattended" hand may show no tension at all, as if simply not included in the volitional command.

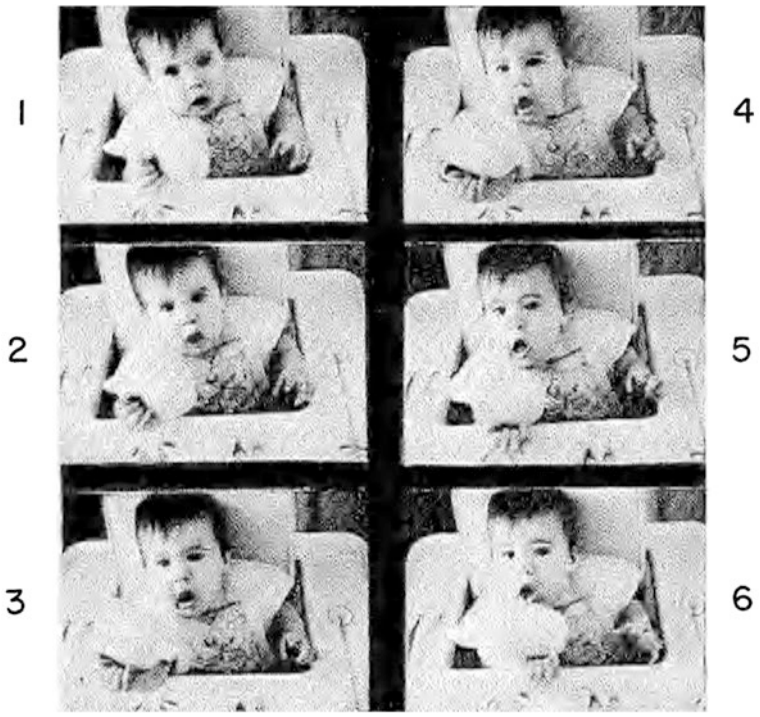

Fig. 10 Anticipatory mouth-opening and mouth-aiming during cup-lift in seven-month-old Kathy

This slow reaching has the mouth as its inevitable terminus. There is an invariant sequence: activation, reach, capture, retrieval to the mouth, and mouthing.

While the arms are being raised, there is a notably fixed, riveted gaze directed at the object, a gaze that seems to sustain the action of arm raising. When the arms are up, and there is movement toward the object, the mouth begins to work, lips moving and tongue in action, or the mouth may simply open (Fig. 10). The object is plainly destined for the mouth. If, as it approaches the infant’s mouth, you insert a finger for him to close on, you will stop the action. (We have used a “hypertoy” as the object, a red ball of two inches diameter, with concentric, white bull’s-eye stripes outlined in black, the center of the area being a circle of black velvet glued to the ball, surmounted by iridescent pearls.) The child may now take his own hand from the object and thrust it, too, into his mouth.*[4]

[4]In the semi-upright position one sees little or no looking back and forth from hand to object prior to reach, though one sees it when the baby is lying on his back with a ball suspended above, as in the observations of White et al. (1964) and of Piaget (1952). With the baby supported in a semiupright position, the visual inspection is all for the object, with the hands being guided by a locational command that seems not to require direct visual checking. It may well be that the upright reaching position provides the child with more usable proprioception and kinesthesis for guidance.

A word about the role of vision: even the sophisticated seven-month-old is likely to launch a reach with visual guidance, but to execute the reach without it. The guidance takes the form of fixing visually on the object, not on the hand. We have seen no indication in these observations of children looking back and forth from hand to object, as Piaget (1952) has suggested. In any case, action is initiated with eyes on the target. Once the action is launched, the eyes may no longer fixate the target. As you can see in Fig. 11, when seven-month-old Kathy is in the midst of reaching for a cup, her eyes are closed. And if the reaching involves some conflict between linear visual direction and the directional course that the hand must follow (detour-reaching), gaze aversion or eye closing may accompany the execution of reach. Or note (in Fig. 12) what happens when Kathy tries to get a two-handed hold on a cup already held with one hand: the conflict in proprioception is *not* adjudicated by visual guidance (which failed the first time it was tried). Degrees of freedom are drastically reduced by the simple expedient of shutting the eyes.

The account we have given illustrates vividly the growth of skill by reduction in degrees of freedom, with the development of programs to operate within the reduced dispensation. Where there is failure of reduction, then we see athetoid behavior, disruption in crying, or immobilization. With growth, there are longer and more variable sequences of directed activity, involving a more complex integrative task. At the same time, there is a notable tendency toward increased uniformity in the time and effort put into the component gestures of the child's acts. His reach takes about the same time for near and far object, his lift of objects is about equal in time whether the object is heavy or light, etc. It seems not unreasonable to suppose that this modularization of the child's timing helps make possible the more flexible and variable sequences of behavior, precisely by permitting their predictable incorporation into a variety of plans.

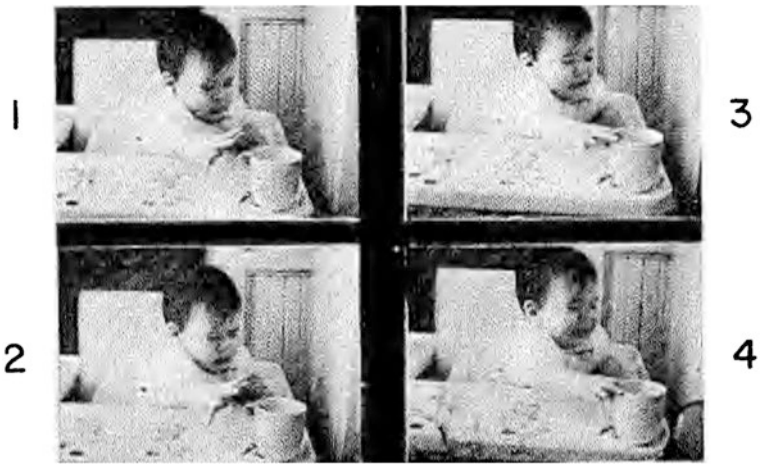

Fig. 11 Kathy reaches for cup with eyes closed during execution of act

Fig. 12 Kathy attempts to capture a cup with two hands and excludes vision in the process

The means available for reduction in degrees of freedom are manifold. There is, obviously, a restriction in the movement of joints—fingers are spread wide, the elbow is rigid, and the child moves on the object with a locked pounce. The midline’s critical role is to be seen in much the same way. Reaching is most likely to occur when the midline of head and trunk are in line and when the object is presented on this midline at some critically close distance. Off that combined line, the object is not so likely to be reached for, nor is reaching so likely to occur if head and trunk are not lined up. Finally, it is crucial to recognize the significance of eye closing and gaze aversion during troubles in reaching or grasping. Functionally, this too must be interpreted as part of the general program of reducing complexity in the interest of the exercise of limited skill.

A word, finally, about the role of the open mouth and wide open hand. Recall how rhythmic mouthing of the nipple served as a place-holder during visual inspection, tiding the infant over the distraction so he could then get back to nutritive sucking. The open mouth during early reaching is one step more sophisticated: it keeps the terminus of the act in evidence during the running off of the component parts. It is this that, in Lashley’s terms (1951), maintains an “atemporal” organization through the sequence of the act and converts it from a kind of Markovian chaining to an intentional act. So, too, the rigidly opened hand is a

measure against the more primitive form of fist-closing: a tactic for maintaining, through exaggerated action, an intention whose fulfillment has been delayed. As with so much early development, processes that later become internal—intention, attention, etc.—have an initial external motoric being that later goes underground.

The voluntary use of the hands from seven months to two years is a bit more familiar, though it has its revealing surprises.

Let me illustrate by a study of detour-reaching. Infants from six to eighteen months are seated before a large box on which there is a screen extending to the midline from the right side or the left.*[5] The screen is either opaque or transparent. An object is placed either in the open, at the edge of the screen, or behind the screen so that it can be reached easily by the hand on the side contralateral to the screen. The object is a hollowed cube with a jingly bell in it, easily held in the hand of a seven-month-old, the age of our youngest subjects. The other groups were approximately 12–14 and 16–18 months. Consider the three major responses observed. The youngest infants mostly reach with the hand on the side where the screen is, directly where the object was last heard, or (it the screen is transparent) where it is to be seen. There is some clawing and banging, and the child is soon distracted to something else. In the second pattern, the year-old more often moves his ipsilateral hand from where it rests on the screen to the edge of the screen at the midline, eventually continuing around with a backhand reach until the object is grasped. In both of these patterns, the unoccupied hand remains on its side of the midline. Finally, the eighteen-month-old child will nearly always reach in with the contralateral hand and straightforwardly capture the object. Within each strategy, one can find a gradual growth of skill as measured by the time required to complete the task. But over the sixteen trials given to each child, there is no greater likelihood of his succeeding on the last reach than on the first, or of his reaching with the contralateral rather than the ipsilateral hand. The learning curves for *strategy*-change over the sixteen trials are simply flat. The youngest children were limited to a reach along the line of sight. Older children operated in a space of motoric continuity. A reach begun with the ipsilateral hand continued to completion with that hand. Finally, the children were able to take account of the geometry of the task itself. Rather than starting with the hand *on the same side of the midline* as the screened object, they could now begin with the hand whose trajectory of recovery would be the shortest.

This developmental sequence is interesting from several different points of view. It is a striking instance, to begin with, of an early form of what Piaget (1954) calls *decentration*—removal of the self from the position of being the sole origin and metric of space and spatial relations. With growth, there is increasing representation of the environment that is independent of the action that is guiding or has guided our use of spatial relations. In another context, I have referred to this development as the transition from enactive representation to ikonic representation (1966), an objectivized form of imagery taking over as the prevailing mode of

[5]This experiment is being conducted by Bruner, Lyons, and Kaye.

summarizing behavioral space, rather than behavioral space being represented by kinesthetic or proprioceptive patterns. Again, I find myself very strongly in agreement with writers like Washburn (1916) and Piaget (1966) who underline the origin of imagery in action. Indeed, I would argue that one can attribute the shaping of imagery to the interplay of *Sollwert, Istwert,* and Δ_w as set forth in Bernstein’s theory of action (Fig. 8). If this is the case, then one of the principal steps forward in the development of any skill is the development of an *objectivized* image or representation of performance that permits one to “get outside oneself.” It is this kind of decentering that constitutes the base for the further growth of childhood skills.

Another perspective on the lines and paths of early manipulatory space is provided by a high-speed photographic study of three children using cups, at seven, fourteen, and twenty-seven months. With the seven-month-old, reaching is a pounce from slightly above the visual line (Fig. 13). Such a reach has no place for detours. By fourteen months, reaching movements can almost be described as successively Cartesian—a spreading apart laterally of the hands and arms from the resting position, then a reaching straight out with both hands moving parallel to the midline or sagittal plane until the hands are about extended to the distance of the object, and then a closing in of the hands on the object (Fig. 14). Indeed, there is a slight pause at each crease or boundary marker in this sequence. I believe that this decomposition of the line of reach into successive elements is what permits objects to be reached by means other than direct line of sight. But at the outset, there is conflict between the visual way and the manual way, and it is this that leads to gaze aversion and eye shutting.

What is so crucial about this sequence of events is that, with development, reaching is occurring *in* a represented space. It is not a case of action and the space within which it occurs being inseparable, as with the youngest child. Once the child achieves a constructed space that is independent of action, it becomes possible for

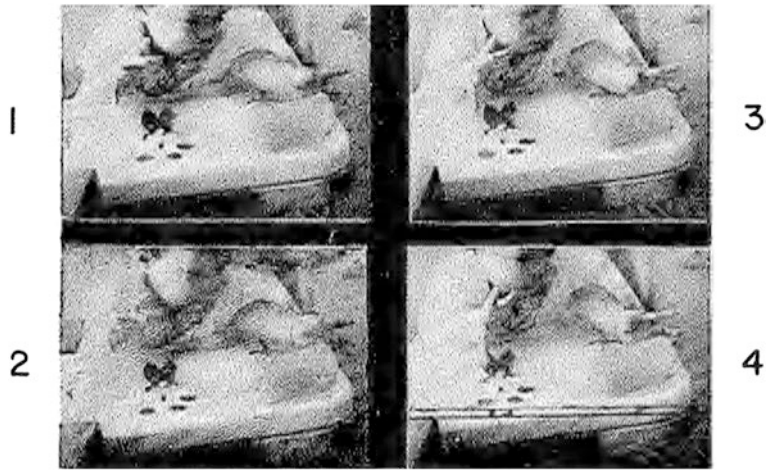

Fig. 13 Pounce-reach of seven-month-old Kathy

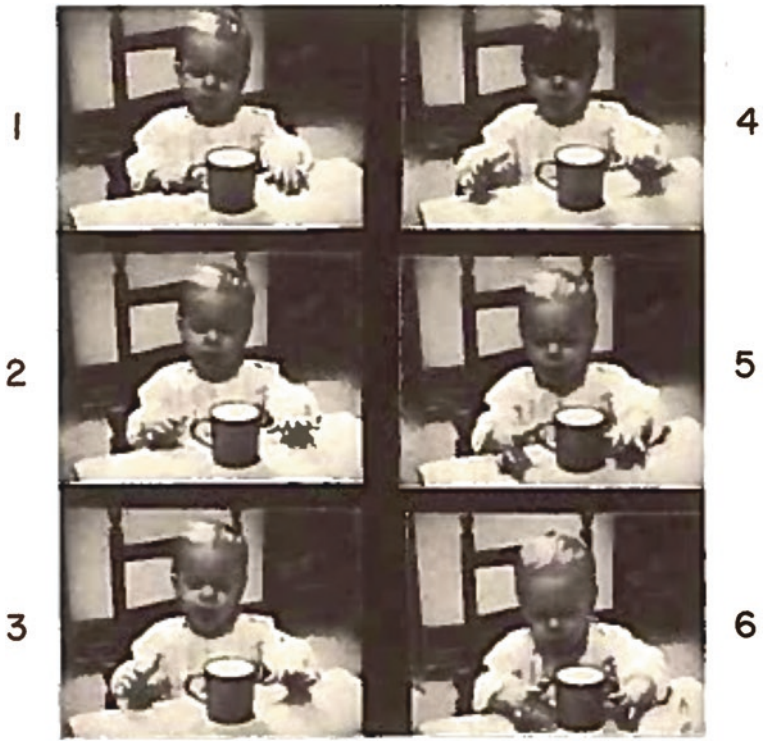

Fig. 14 The "successively Cartesian" reach of fourteen month-old Oona

him to deal with such interesting and important contingencies as those involved in dealing with objects where the line of sight and the line of reach are not the same.

In general, then, the first phases of skill development involve the perfecting of the means for mastering voluntary control in "motor problems," of translating intention into action, and of improving action through correction. The second phase is the process of developing guiding representations of the behavior space that can provide points of reference in terms of which action can be regulated. The first of these steps is crucial for enactive representation, the second for ikonic.

* * *

I would like now to cross the threshold from the intelligent use of the hands to the use of tools. But there are several preliminaries, prerequisites to tool use, that need close examining first. One was set forth forty years ago by Grace de Laguna in her classic *Speech: Its Function and Development* (1927). Let me quote from that book:

> The club or stick that is used to strike or poke things is in certain respects like a supplementary limb. It enables the ape or man who uses it to act at a greater distance…. He would come to use the stick virtually as a part of himself, as the blind man uses his cane…. But sticks are not all the same length. Some are too long to be wielded, some

> too short. He must learn to choose those of usable length, and adapt… to their differing sizes…. But this discrimination is still only of lengths relative to himself…. To strike an effective blow with a stick, his movements must be regulated and controlled *both by the distance of the object and the length of the stick*…. He learns to attend to the length as a determinate and variable feature, and *he perceives it in terms of the distance to be reached.* So, too, he learns to see the distance of an object not merely in terms of the movements of his own body in reaching it, but *in terms of the length of the stick he must choose*…. As the indirect dealing with implements becomes extended, it is not merely the distance of the object from himself that comes to be perceived in terms of length, but distances of objects *from each other* (pp. 219–220).

Our observations on cup use, conceiving of the cup as a tool, have taught us a little about this skill. In a seven-month-old in the first week of cup use, there is no appreciation of the problem of maintaining the rim of the cup at an angle compatible with the horizontal level of the fluid within. Our camera speed of fifty frames per second indicates no adjustments between hand and mouth. The result, of course, is a cataract down the child’s bib. The parent may respect the reduced degrees of freedom of the rigid cup handling by filling the cup only slightly. Or the child may lean forward toward the cup in the course of the reach. At fourteen months, the child achieves the match of cup with water level by the application from lift to mouth of four to six corrective, gimballing movements of the hands, wrists, and elbows. By twenty-seven months, the discreteness of correction is all gone, and the hand-wrist-arm system maintains the rim through what in effect is a zero deviation from horizontal. We can say that tool using is on the way (see Fig. 15).

But it is obviously pretty crude; something is missing, some more preliminaries. For one thing, there is in early childhood a singular lack of sustained direction. Jonckheere (1967) in our laboratory did some observations on two-year-olds, involving tasks where rewards could be got by pulling in one of several strings; other strings were perceptibly not attached to the reward object, as in Klüver’s

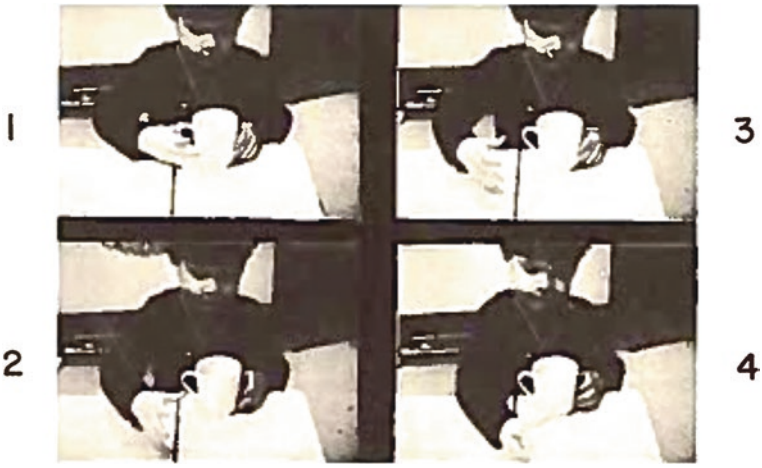

Fig. 15 The flexible, oblique reaching of twenty-seven-month-old Nathan

study (1933) and in Richardson's (1932). It is known that forty-week-olds will pull in single baited strings (Richardson 1932). As with earlier studies, the children failed, pulling in all strings or the one closest to them.

Three things made it difficult for the two-year-olds to maintain problem solving long enough to resolve the simple problems given them. The first was "play": exploring and manipulating the string itself, or the edge of the playpen, etc. It is very reminiscent of the neuro surgeon Rylander's (1948) lobotomized cook who could never get to the center of the city to shop, such were the tempting objectives encountered en route, or like Luria's (1966) frontal lobe lesion cases who suffer the same alterability of goal. I shall then take "play" to mean altering the goal to suit the means at hand whereas "problem solving" (including games) involves altering the means to meet the requirements of a fixed goal. The obvious importance of play as a means of exploring means-end compatibilities is, of course, hardly to be minimized. But the dominance of the play set is clearly incompatible with directed tool use.

A second interfering factor was the child's routine use of other human beings as "tools." If the experimenter or the parent is in view, the result would usually be the use of "pleading" rather than tools—the out-stretched arm or the crying plea for the object out of reach. I commented earlier on the "shield of infancy"—and surely the provision of service by the adult in response to signal from the infant is one of the most important lamina in that shield. To be sure, as Sears et al. (1957) have emphasized, the major aspect of dependence and independence is an affective relationship in a parent-child dyad. But there is also an instrumental side to the matter that certainly bears closer inspection than it has had.

A third interference was, plainly, "channel capacity," the number of features that the child can deal with simultaneously. The child may look at the object, at the strings, at the bars of the playpen, and seem (as in Richardson's [1932] earlier study) to be overwhelmed. Let me note in passing, very briefly, some amusing observations Simenson, Lyons, and I have been making on the infant's ability to deal with multiplicity. Briefly, the experimenter hands the infant a "hand toy" at the midline, then immediately, before he can do anything with it, another is handed to him, again at the midline. Then a third in much the same way. The timing is a function of how long the child requires to get his hand firmly on the toy. At about seven months, if the second toy is handed before the first is started on the way to the mouth, the usual picture is for the child to abandon the first, pick up the second with the same hand and move *it* to the mouth, the abandoned toy being ignored during the act. Usually by twelve months, the second toy at the midline is taken by the free hand, and if a third is now put at the midline, one of the others is dropped and the new toy picked up. At about a year and a half, if not sooner, the same task is dealt with by the child taking the first toy in one hand, the second in the other, and when the third is presented, putting one of the held ones in the crook of the contralateral arm, thus freeing one hand for taking a new object, which he will continue to do if further toys are proffered by the experimenter. The child has gone from a limit of one, defined by the mouth, to a limit of two, defined by the hands, to a limit of many, defined by a reserve. Likely the reserve is governed, like so many other things, by George Miller's magic number 7 ± 2 (1956).

And so it goes with other aspects of multiplicity. One’s ability to process multiple events is precisely a function of the ability to process rather than merely to recognize or perceive that objects are present. The infant is *constructing* forms of multiplicity by his way of coping with the situation, and these ways may even be as overt as in the experiment just described.

The development of tool use will depend, then, on the child’s capacity to extend or amplify his range of means by converting features of the environment to his own ends, by doing this in preference to using a caretaker as an amplifier, by holding a goal invariant so as to examine the relevance of alternative means, and with a strategy that makes it possible to hold multiple considerations in relation to each other. It is astonishing how little we, in an advanced technological society, know about these matters.

* * *

The Achievement of Codes

Finally, we turn to the child’s acquisition of rules that precede the rules of syntax. Some of my colleagues think the latter arise from innate ideas (e.g., McNeill 1966; Katz 1966; Chomsky 1967). Goodman (1967) has published a critique of this view in the form of a dialogue between Jason, just returned from a visit to the nomads of Outer Cantabridgia, and Anticus who suspects that what Jason has brought back is more fleece than golden. Anticus says,

> What we call a language is a fairly elaborate and sophisticated symbolic system. Don’t you think, Jason, that before anyone acquires a language, he has had an abundance of practice in developing and using rudimentary prelinguistic symbolic systems in which gesture and sensory and perceptual occurrences of all sorts function as signs?…. I submit that our facility in going from one symbolic system to another is not much affected by whether each or either or neither is called a language (p. 25).

So let us begin with limited subspecies of symbolic learning involved in social interaction, for which I shall use the term *code learning.*

Let me first suggest that one may draw a rather sharp distinction during the first year or eighteen months of life between what my colleagues Richards, Brazelton, and Trevarthen refer to as “doing” behavior and “communicating” behavior-behavior addressed to ward “things” and behavior addressed toward persons. There are several specific and obvious features (as well as several general ones) that differentiate the two forms of behavior: eye-to-eye contact is a major link between caretaker and infant, we know from Robson’s (1967) excellent review, and it has no counterpart in “doing” behavior. The same can be said for smiling, for crying, and for vocalization. The differences in the non-specific response patterns are only now being examined by Brazelton and Kelly in our laboratory, so it would be premature to say anything about them at this juncture.

We know from a few studies, such as those of Rheingold et al. (1959) and of Brackbill (1967) that there either is an innate predisposition to expect

reciprocation of some kind to these specific gestures or there is a very quickly acquired expectation of reciprocation in social communication. At four months of age, for example, Brackbill (1967) finds that the infant smiles more to a face that smiles back than to one that does not respond. Now, if a face that has been smiling back now discontinues doing so, vigorous gaze aversion may result each time the non-responding face appears. Failure to obtain reciprocation produces an active avoidance—indeed, the child will struggle bodily to look away. Papoušek and I have been studying the manner in which three-to four-month-olds respond to unpredictable disappearance of mother, and again the effect produced in the body is a reduction in time spent looking at the mother and in engaging her in eye-to-eye contact.

What seems to get established very quickly between infant and parent is some sort of code of mutual expectancy. It seems to get established when the adult responds to an initiative on the part of the child, thus converting some feature of the child's spontaneous behavior into a signal. In turn, the child comes to expect response to follow from behavior he has initiated. Ainsworth (1967), Sander (1962, 1964), Freedman (1967) and David (1967) have all described this pattern of endowing the child's response with signal properties by linking the infant's initiative with adult response until such a time as the child performs an act with the expectancy of obtaining the adult response. Indeed, Sander (1968) is of the view that this pattern is discernible by the end of the first week of life with respect to crying. Neonates raised in a conventional hospital nursery provide a sharp contrast with ones raised by a living-in caretaker. The nursery infants fret and cry without the immediate response provided by a one-to-one caretaker. In consequence, when the nursery babies are shifted at ten days to a home nursery with an individual caretaker, they are slower in responding to regular feeding schedules than the one-to-one babies. They have not come to expect regularity in response to their initiative. The one-to-one babies quickly come to expect response, cry less, and in general are much more readily shaped to a schedule of daytime feeding and night sleeping. Their expectancy of response to their crying and fretting lead them to expect and respond to regularity in caretaker behavior more generally.

There is a subsequent development that follows upon this that has been called *conventionalization.* Once the infant expects that he can produce a predictable effect, there is a "stripping down" of the producing act to the point where it operates as a signal or isolated symbol. The nature of the cry changes—becomes less intense. And, of course, it is not a phenomenon limited to vocalization. It also characterizes the growth of gesture signs as Latif (1934) most vigorously insisted, pointing out as well that there is a corresponding conventionalization in the reaction of the parent or caretaker.

Suppose we grant the importance of these interaction codes for some later aspects of communication and language. Does this kind of learning have any kinship to the *formal* rules of language that the child will have to acquire? One must be very wary here. Even in so simple a case as the acquisition of *babbling*

sounds and *speech* sounds, there may be a disjunction that is striking (McNeill, in press). The order in which the sounds of babbling are acquired between three and ten months is, for vowels, from front to back, and for consonants, from back to front (Irwin 1947, 1948; Bever 1961). Yet, as Jakobson (1941) has shown in his celebrated paper on the acquisition of *speech* sounds, the reverse holds in language acquisition. Vowels come in from back to front, consonants from front to back. The first acquisition is the sharp oppositional distinction between the closed, unvoiced front consonantal stop of minimal acoustic energy /p/, and the open, voiced, maximum energy back vowel /a/. Acquisition of a *speaking* rather than a *babbling* phonology consists, as McNeill (in press) succinctly puts it, in filling the space between /p/ and /a/ through differentiating of consonants into oral and nasal, /p/ and /m/, then the orals into dental and nasal, /p/ and /t/, and so on. The vocalic side goes through similar differentiation into narrow and broad, /a/ and /i/, etc. Now, the underlying basis for acquiring *speech* sounds may represent quite a different case than that for the acquisition of *babble* sounds. The latter may represent a maturing of the speech-generating mechanism; the former may be genuinely related to some underlying preference for the use of these sounds in communication. Babbling sounds may be a prerequisite for the use of these sounds in speech proper. But to confuse babbling with speech would be a grave error. So too, to treat interaction codes as if they were the same as linguistic codes proper would be in error, even though one is a prerequisite for the other.

Language is a rule system on several levels, such that a handful of distinctive features is permuted into a few dozen phonemes, from which in turn is formed a vast stock of morphemes, out of which a practically limitless flood of proper utterances can be generated. The *channel* for this system derives, I believe, from the continuous enrichment of interaction codes. But the *form* of the code must come from elsewhere. I believe it constitutes a refinement of human sensorimotor *skill.* Indeed, the growth of phonology is itself the mastery of a neuromuscular skill—the delineation of modular sound production from the mouth as a funnel opened *outward,* the voiced /a/, and as a funnel opened *inward,* the unvoiced /p/. I would even be so outrageous as to suggest that the kind of modularization that is present in phonology—the formation of binary oppositions—can in a cruder form be seen in other forms of human skill development. We have already noted how the infant’s hand movement grows from the babble of athetoid movement of the fingers, to a sharp contrast of “hand wide open” and “hand tight-fisted” during reaching. We have also noted the modularization of part acts into roughly equal time segments and how these may be coordinated into different sequences that Lashley (1951) likened to syntactic structures. It is astonishing that we psychologists have never examined the later stages of this development more carefully—not to find analogues, but to explore in detail the continuities and discontinuities between, say, skills of the hand and skills of the speech production apparatus. I realize that such speculative arguments leave much about language unexplained. My object is not to propose a comprehensive account, but to suggest, rather, that we look elsewhere than to early vocal interaction for precursors of language rules.

Indeed, I believe it is even possible to make a not utterly absurd case for a non-linguistic origin for so essential a rule of language as *predication.* All languages, with no exception whatever, are organized by predication.

John is a boy.

John has a hat.

John caused a riot.

John became a man.

Basically, predication involves the differentiation of an event into *topic* and *comment* (McNeill, in press; de Laguna 1927). John is the topic; his boyhood, his possession of a hat, his riot production, his achievement of manhood are the comments on the topic. Is there a homologue in human non-linguistic behavior that would predispose language to the form of predication? Let me again suggest that there may indeed be. Only closer inspection will reveal whether they are non-trivial. One candidate is on the side of information processing; the other derives from manipulative skill.

Information processing, described by theorists as diverse as Neisser (1967) and Sokolov (1963), seems to involve a comparable differentiation. Neisser, for example, distinguishes *focal* attention from a more diffuse aspect of sensing, and takes the constructionist view that we organize events through syntheses of successive focal attendings. Each instance of focal attention may be conceived as a comment on a topic, an extraction of a feature from a more general sensory input. For his part, Sokolov notes that in the orienting response we attend to a deviation from a "neural model" of some steady state on which we have been fixing over time. When the deviation is at some critical level adequate for activating a system of extrapolatory neurons, we attend or orient. The deviation in some feature of the event is, in effect, the comment, the topic being the steady state neurally represented.

On the manipulatory side, there may be evolutionary as well as developmental parallels in the differentiation of manual prehension into a power or "holding" grip and a precision or "operating" grip. The evolutionary history can be sketched briefly as follows (cf. Buettner-Janusch 1966): Among prosimians, there is very little distinction, and the grip is a whole-hand grip varying principally in the force applied. There is even some dead-end morphological specialization away from the precision grip among lemurs toward a so-called "tooth comb" to aid the mouth in grooming. The precision grip appears in the monkeys and is well developed in the great apes. It is not until one comes to man with his asymmetry that the power grip migrates to one hand (normally the left) and the precision to the other. At this point, many routines are worked out for holding an object with one hand while working it with the other, a predicative procedure that probably has a profound effect on tool use and tool making.

In the human infant, it is not until well toward the end of the first year of life that he is able to use his hands in a fashion such that one holds or prepares an object for the other to operate upon. In our laboratory, we have used a rather

Fig. 16 Two-handed obstacle box for studying the complementary role of right and left hands

simple device consisting of a sliding transparent cover that must be pushed up and held by one hand while the infant reaches inside for a toy. If he attempts to do both acts successively with a single hand, the cover slides back into place on its ball bearings and covers the toy (cf. Fig. 16). Prior to mastery, the child is likely to use a single hand or both hands together successively. It is at about the time of mastery that the child begins showing some preference for one or the other hand.

Let me risk the speculation that the differentiation of *holding* and *operating upon what is held* may be the same rule as diffuse and focal attention and that both may presage the development of *topic* and *comment* in human languages.

What I offer by way of apology for this rather unbridled speculation is my wish to take Anticus seriously when he urges Jason, in Goodman’s (1967) dialogue, to consider whether there may be rules or systems which, when learned, might predispose a human infant to language. The *channel* of language is doubtless dependent on the growth of interaction codes. The origin of the uniquely human *form* of language remains very much a mystery. I have proposed that it is a refinement or extension of human skill as exhibited in the attentional system and the motor system as represented by man’s clever hands. It seems to be a not unreasonable

hypothesis that human skill, human information processing, and human language might conceivably be a set of related responses that differentiated man as he evolved from his hominid ancestors.

Epilogue

In these pages we have been occupied in close detail with the growth of human competence. The focus has been upon the manner in which voluntary, skilled, codeguided behavior first emerges in infancy. Research on early development is only at its beginning, and there is emerging here and abroad the beginnings of a comprehensible picture. Much remains to be done, and I hope that the work of our laboratory at Harvard will contribute to the increase in understanding.

I would like, by way of an epilogue, to voice some strong biases that our work has produced in my own thinking—they are biases, not truly conclusions. They concern not only the nature of infant cognition and how it should be studied, but also how this work might better shed light on the nature of adult cognitive functioning.

Functional systems. The first is that organic activity can be understood only by recourse to the idea of systems conceived as designed to fulfill functions. It is not quite as in morphology where one differentiates nervous system from digestive system. Rather, it is much more as in systems engineering where one thinks of what it takes to deliver cargo over a particular set of terrain, with certain limits on time, cost, etc. The major functions of living require systems for their fulfillment, and at different stages these will vary drastically in their components, sometimes automorphic, sometimes alloplastic and dependent on tools and social organization. An infant can feed at his mother's breast; a civilized adult may require refrigerated imports. Breast feeding is embedded in a series of related activities and is dependent upon them—just as surely as dependence upon imports and refrigeration presupposes other supporting activities. When one examines infancy carefully, one is struck by the artificiality of analysis that is based upon the examination of isolated responses. Responses are parts of larger systems, and these larger systems are what require deeper study.

Order. There is a vast amount of order built into the human body and its nervous system that serves to shape, constrain, and support organic functioning. The morphological constraints include such specifications as the fact that we reach close to two meters in length, have two eyes, that our ears are facing sideways, that our interocular distance is a few inches and our arms about a meter long, that we are bilaterally and not radially symmetrical, that we are bipedal and our hands asymmetrical in skill. I mention these particular banalities because it is extremely difficult to understand the growth of human functional systems without bearing in mind that man's structure imposes a shape on human skills just as crucially as do the bizarre proportions of science fiction characters. From these constraints of morphology derive crucial constraints on cognitive learning. We have been

particularly attentive to this issue in examining the growth of skill, with its many preadaptive constraints that operate to lead the hand-eye system to develop as it does. But it is, I believe, a more general rule that the inheritance of evolution is structural order that leads to language taking a particular form, to attention being organized along certain lines, etc. It is a commonplace, but one too easily forgotten—until one examines such compelling phenomena as the emergence of order behavior in infancy.

Evolutionary inheritance. Granted ontogeny does not recapitulate phylogeny, we would do well to continue to attend to the relation between the two. Human infancy probably reflects the trend toward neoteny among primates, as LeGros Clark (1963) speculates, a tendency for evolution to select among primates of infantile characteristics. As LeGros Clark remarks, the adult nervous system is much closer to the *fetal* brain of higher pongid apes than it is to their mature brains. And there is, moreover, a strong trend in primate evolution toward distance receptors, toward bipedalism, toward the exaggerated pentadactyly of independent digits, toward cortical control. These are matters of crucial importance, and a developmental science of man without a sense of man’s primate origins would be shallow.

Immanence. I shall assume, here strongly influenced by Lashley (1951), that cognition—the achievement, retention, and storage of information—is inherent or immanent in the functional enterprises of organisms. It can never be studied independently of the decisions that organisms take individually or evolution takes collectively concerning the grammar or logic of action. So, when we study the changing responses of the three-week-old infant to changes in the pay-off for sucking, we are studying not just sucking but the infant’s mode of coping cognitively with a changing environment. Cognition has its origins in the early development of intelligent action, and the nature of intelligent action is obviously a proper study for the student of cognitive processes.

Terminus. The unique terminus of human growth is that to survive, humans, like other animals, must take their place as members of the species. In the case of humans, this is quite a special order: to become members of linguistic and mythologically instructed communities, to join a common data base, to use a pool of technology, etc. Just as the notion of functional systems need not trap one into “explaining” a phenomenon by referring to the function it serves, so an appreciation of terminus need not lock one into the doctrine of final cause as an explanation of growth.

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Let's Frankly Play: Ambivalence, Dilemmas and Imagination

Luca Tateo

> *"***Pina Marsico***: in your opinion what is to be studied more, to understood more of our human condition, for the future generations? On the basis of your scientific program which is the direction in which we have to go… looking towards the future?*
> **Jerome Bruner***: Yeah ((pause)) it's basically ((pause)) much more concerned with the human dilemmas that are characteristic of the life, that is the sharing of dilemmas I mean"*
>
> (Interview with Jerome Bruner, January 26th, 2015, New York, USA)

Introduction

Behind the thick glasses, the jolly smile and the flirting lust for conversation, Jerome Bruner is a restless and perplexing man. You can sense it by his sudden pauses, a bit too long to be accidental, while inhaling the smoke of his cigarette, pretending to smoke only the pipe, and by the elegant way of avoiding to answer some personal questions with a histrionic diversion. He is a true lover of mankind. From the very beginning he has been attracted by the manifold variety of human activity. In his books you can find the unremitting quest to understand the sublime peaks and the deepest bowels of human achievements. As a contemporary

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humanist, he is profoundly conscious of the ubiquitous ambivalence of meaning-making processes and the dilemmatic nature of experiencing. But he also endlessly admires the human capability of coping with the ineffable through the creation of whole systems of meaning.

> The realm of meaning, curiously, is not one in which we ever live with total comfort. Perhaps it is this discomfort that drives us finally to construct those larger-scale products of language-drama and science and the disciplines of understanding-where we can construct new forms in which to transact and negotiate this effort after meaning (Bruner 1986: 64).

This is why he has become more and more skeptical towards a psychology "in vitro, treating chunks of behavior out of the controlling contexts in which they ordinarily occur, even though the contexts have a massive influence over the chunks" (Bruner 1979: 170). This misleading way of running after natural sciences would betray the fundamental lesson of the three giants he acknowledges as inspirers, Vygotsky, Piaget and Freud, that is the relationship between the person and the environment. Indeed, their legacy was to strive for the complexity of experience that takes place in a polysemic, ill-defined, multiform and developing environment. That is why the unit of analysis for psychology cannot be "chunks of behavior", but must be, "an indivisible unity of personal characteristics and situational characteristics, which are represented in the emotional experience" (Vygotsky 1994: 342). A psychological science that renounces to this task, will be able to obtain only trivial results. "The more rigorously isolated from context and the more tightly controlled the conditions of the experiment, the more precise and the more modest results have been" (Bruner 1979: 170). Starting from this awareness, Bruner developed a scientific endeavor "to explore some of the ways in which we create products of mind, how we come to experience them as real, and how we manage to build them into the corpus of a culture as science, literature, history, whatever" (Bruner 1986: 45). Only in the complex products of human mind and activity, such as literature and storytelling (Bruner 1986), myth and art (Bruner 1979) and law (Amsterdam and Bruner 2000), one can grasp the ambivalent, dilemmatic and creative nature of psychological experience.

For this reason, I hope he will like my playful attempt to comment on his vision by using a character that he certainly enjoys: Shakespeare's Hamlet.

How a "Brunerian" Hamlet Would Look like?

The first performance of Hamlet took place in 1599–1560 at Globe Theater in London. The first interpreter was Richard Burbage, a quite fat middle-aged Shakespeare friend and usual actor, very far from the athletic, sexy, pale and handsome young man's representation that more than seventy-five screen movies

conveyed (Hunt 2007). "Indeed, Gertrude's remark in the duel between Hamlet and Laertes that her son is "fat and scant of breath" could well be a comment on Burbage's weight" (Hunt 2007: 3). On the contrary, the character of Hamlet is that of a privileged, noble-class, light hearted student, half nerdy and half bugler, who is carrying out a quite happy life in Wittenberg university town with his mates, until the sudden death of the king-father drags him back home, where he finds his mother soon remarried with his uncle. Actually, from the very beginning of the play, everybody is treating him as quite an immature young man. Gertude, the mother, Claudius, the uncle and new king, Polonius, the king's counselor, always address him in a kind of indulgent and childish way asking to stop is mourning for the father's loss. Nor he is considered more mature by Laertes and Polonius with respect to his supposed love for Ophelia, as they both advice the young girl, in the scene 3 of first act, to not believe Hamlet's love worlds as they are: "a fashion and a toy in blood", youth hormones as Laertes warns (Raffel 2003: 28). Or, as Polonius puts it:

> Lord Hamlet,
> Believe so much in him, that he is young
> And with a larger tether may he walk
> Than may be given you. In few, Ophelia,
> Do not believe his vows, for they are brokers (Raffel 2003: 34).

From the very first time Hamlet appears on the scene, instead, we are informed that there is much more than that. In fact, in the scene 2 of act 1, he answers Gertrude's pray for leaving the mourning attitude by revealing, apparently unheard, the distinction between is manifest behavior and his inner states. His dresses and attitude are not but the external signs:

> Together with all forms, moods, shapes of grief,
> That can denote me truly. These indeed seem,
> For they are actions that a man might play,
> But I have that within which passeth show;
> These but the trappings and the suits of woe (Raffel 2003: 18).

Who Hamlet actually is? Is he the psychoanalytic hero whose ambivalence and unresolved relationship with the father figure and jealousy towards the mother lead him to tragic consequences? Or he is rather the postmodern and nihilist individual, unable to take the control of his life, blocked by the existential condition of the lack of overall values? Or is just a childish spoilt young man who is confronted with the roles and responsibility of his rank for the first time in his life? Why this character and his vicissitudes are so appealing to people of different times? What we can find in this drama, and how we make sense of it and use it to make sense of our lives in return? What the relationship with Hamlet, and the very different ways in which people have enacted his story in different contexts, can tell us about psychological experience? There are probably no ultimate answers to these questions, as the answers are inconstant and evolving as experience itself. Yet at the same

time, the kind of continuity that Hamlet persistence in our culture is signaling us something about the forms of continuity that is making such mutable experience a common legacy of being humans.

We know very little about Hamlet childhood from Shakespeare own words. We can figure him riding jester Yorick's back, under the severe, strong and maybe distant gaze of the venerable king and the lovely and maybe lusty wing of the queen. Which kind of environment surrounded him in Elsinore's castle?

> His temper is naturally irritable and passionate, as might be expected with one who was at once a prince, and the only child of a foolishly fond mother; but his irritability is for the most part kept carefully under control, and when for a moment it breaks out, it is speedily repressed with remorse and selfcondemnation, and manly entreaty for pardon from him it has attacked (Hunt 2007: 130).

In other words, Hamlet himself is not such an interesting man from the point of view of development to the extent that his personality could be understood in terms of his relationship with the environment and the process of education he underwent. Though psychology often seems to ignore it, Hamlet's trajectory characterized by ambivalence, dilemmas, daydreams, uncertainty, wrong decisions, compassion, egoism, tenderness and guilt is the rule rather than the exception in real life. No pathology in his difficulty to make a decision and take a course of action before the father's death, the mother's second marriage and his clumsiness in seeking for Ophelia's love. In fact, Shakespeare himself had to introduce a supernatural mechanism, the armed ghost, to trigger a dramatic plot that would be otherwise similar to the contemporary story of scattered families. Far more interesting is the way *we* experience his drama.

According to Bruner (1986) there are two complementary modes of thought: the paradigmatic and the narrative. They organize experience in different way, as they use distinct rationales to establish causality, to persuade, to verify truth. "One leads to a search for universal truth conditions, the other for likely particular connections between two events-mortal grief, suicide, foul play" (Bruner 1986: 12). In Hamlet's case, the conditions for the reader to participate in the drama is that of following the narrative mode of thought, that is first of all suspending the disbelief and accepting the conditions of reality typical of narrative. So, no logical causality in king's ghost, Hamlet's folly, Ophelia's suicide or Laerte's challenge. Nevertheless, they perfectly make sense in the play's development and we accept to enter the story, though as simple spectators, a little less than Horatio, who is both spectator and designated narrator. No sense in "trying to play Hamlet without the ghost" (Amsterdam and Bruner 2000: 204).

Yet, here I have a problem. Is it possible that we find perfectly plausible the mass extermination of Hamlet and his family only because we grant the author the total freedom by suspending our disbelief? Or is instead because we find the drama *verisimilar*? Here one of Bruner's favorite philosophers, Giambattista Vico, can come and help us (Tateo 2015).

Imagining Thoughts, Deeds and Alternatives

In Chap. 9 of *Poetics*, Aristotle says about the difference between a historian and a poet:

> The real difference is this, that one tells what happened and the other what might happen. For this reason poetry is something more scientific and serious than history, because poetry tends to give general truths while history gives particular facts. By a 'general truth' I mean the sort of thing that a certain type of man will do or say either probably or necessarily. That is what poetry aims at a 'particular fact' is what Alcibiades did or what was done to him (Aristotle, 1970: 28).

I find this excerpt extremely challenging, because it has two main implications for psychology. The first is the difference between inductive and abductive modes of generalization. The logic mode of thought proceeds looking for inductive relationships that are candidates for generalization and deductive systematization. The abductive generalization is instead grasping every specimen of human experience as necessarily generalizable without losing his historical specificity. Usually, is understood that abductive generalization is useful in generating theories and hypotheses, but does not work in verification or falsification.

The philosopher Giambattista Vico (1668–1744) claimed that, when we come to the realm of human civilization, the only way to understand human mentality in a specific historical period is to access its specific form of elaborating experience and developing universal concepts. We shall apply a specific method of inquiry to understand how human beings create their way of organizing experience and constructing reality. For Vico, humans make sense of their experience by creating universals through generalized concepts and abstracted images (Tateo 2015). In other words, through imagination, understood as the distinctive capability of mankind, people create entities to whom they attribute generalized traits and such entities become in return the model for every further explanation, until the process repeats under the pressure of new experiences, partially modifying the old universals. These explanations are crystallized in myths, that both provide a shared systematization and an externalization of the unpredictable (Bruner 1979). For instance, the notion of fate has undergone several modifications from the ancient Greeks to the modern technocratic Western society, in parallel with the developing human capability of mastering the events of nature (Bruner 1979). When it comes to the understanding of our fellow humans, rather than nature, the question is different. While imaginative processes, according to Vico, tend to create generalized abstract but iconic representations of natural phenomena, at the same time, in the hands of the modern mankind, imagination remains the only form through which we can access the incomparable minds of remote civilizations. We cannot but imagine how an ancient Greek would conceive the world, based on the philological evidence we can gather. Yet, are we sure that the same problem is not at stake in every form of dealing with otherness? For instance, in developmental psychology, how we can access the infant's mind but through imagining what is going on, based on the observational or experimental evidence we can cumulate?

Besides, imagination as a form of access to intersubjectivity and otherness, whether between ancient and moderns, adults and infants, you name it, becomes, thanks to Vico's insight, an epistemological tool. The question is thus what can be the role of imagination in the two forms of generalization and abstraction, that of paradigmatic and narrative modes of thought, if, as Bruner seems to suggest, they are irreducible to each other thought complementary?

> The imaginative application of the narrative mode leads instead to good stories, gripping drama, believable (though not necessarily "true") historical accounts. It deals in human or human-like intention and action and the vicissitudes and consequences that mark their course. It strives to put its timeless miracles into the particulars of experience, and to locate the experience in time and place. Joyce thought of the particularities of the story as epiphanies of the ordinary. The paradigmatic mode, by contrast, seeks to transcend the particular by higher and higher reaching for abstraction, and in the end disclaims in principle any explanatory value at all where the particular is concerned (Bruner 1986: 13).

Let's go back to our black Prince of Denmark. We left him in the midst of the dilemma between going back to enjoy his student's life in Wittenberg and staying in Elsinore, where an adult and dramatic fate is about to ask him to devote himself to revenge. What is interesting in Hamlet text, is that we know everything about both the situation and the characters thoughts. In this sense, Hamlet is quite a modern play, in which the reader is confronted with a process of "subjectification", that is "the depiction of reality not through an omniscient eye that views a timeless reality, but through the filter of the consciousness of protagonists in the story" (Bruner 1986: 25). The audience is always informed of what is going to happen. Hamlet, Claudius, Polonius and even Laertes are always describing their plans explicitly. This also creates a "multiple perspective", that is "beholding the world not univocally but simultaneously through a set of prisms each of which catches some part of it" (Bruner 1986: 26). The only characters who seem to act without any prearranged plan are the female figures: Ophelia commits suicide and Gertrude drinks the poison. How do the reader gains access to the characters' minds? Here is where Bruner's concepts of subjunctive mode of thinking and possible worlds meet Vico's idea of imagination. When we can observe only other people's behavior, imagination is the way of accessing others' reasons for action. In this sense, every theory of mind is a theory of imagination. When, as in the case of Hamlet's characters, we can access both thoughts and description of actions, thus imagination has to do with creating a sense of being there. In this sense, imagination is a way of emotional experiencing (Vygotsky 1994). Finally, imagination is a form of abductive generalization (Tateo 2015), thus Hamlet becomes the poetic universal of human dilemmas, Claudius becomes the poetic universal of the betrayer and Ophelia becomes the one of the tragic love which is not reciprocated. Such universals become in return the models through which we form the representation of our own emotional experiences. Everyday dilemmas become Hamlet-like and sad lovers become Ophelia-like. The psychological situations of Shakespeare's characters are neither less generalizable nor less real than every other observable in psychology. All these modalities of imagining are a way of "trafficking in human possibilities rather than in settled

certainties" (Bruner 1986: 26). Imagining thoughts, deeds and as-if possibilities is thus the way we can work compromises between our needs, will, dreams, fears, and those of the others within a cultural framework that provides us with a range of guidelines and examples of negotiations. Actually, we are dealing all the time with future-oriented questions like "what shall I do (or avoid to do) now", as in the third scene of act 3, when Hamlet finds Claudius on his knees and reckoning whether to kill him at once, he says: "Now might I do it pat, now he is praying" (Raffel 2003: 132). What makes Hamlet's story so interesting for us is that it narrates in a sublime way the dilemmatic nature of human experience, to which I will come in the next section. *Now* is "the specific sign that, once produced, establishes the conditions for the psychological horizon to participate in the production of new psychological phenomena through the co-regulation of psychological processes" (Tateo 2014: 236). In general, adverbs and conjunctions that work as operators establishing conditional, inclusive/exclusive or causal relationships (e.g. "therefore", "if" "then", "but", "now", "as", etc. in English language) are extremely interesting from the psychological point of view. They are the linguistic tools through which we can virtually create any kind of possible world, by establishing relationships between sentences, according to contextual conditions of use and individual goals. Interestingly, this works in both the paradigmatic and narrative modes of thought. Hypothesis building in science is nothing but the articulation of relationships through those operators, whose verification enters a posteriori. "The term *then* functions differently in the logical proposition 'if x, then y' and in the narrative *recit* 'The king died, and then the queen died.'" (Bruner 1986: 11–12). But the role of establishing an horizon that will guide the future oriented-action is the same. Sense-making is not just in producing isolated propositional statements about reality, that would not be of any developmental or epistemological utility. Sense-making is producing webs of relationship between different parts, but at the same time, relationships constitute a new whole, that is "a series of consequences that human beings inscribe on the lives of other human beings through the medium of those ideas" (Amsterdam and Bruner 2000: 6). What Amsterdam and Bruner (2000) argue about the role and functioning of law in the United States, can be generalized to every product of human activity. Through semiotic operations of establishing *as-if, now* or *therefore* relationships, people draw a slightly different *doppelganger* of the world with the twofold function of making sense of uncertainty and otherness and self-regulating future experience. But these "possible world" are not free from ambivalence, which is generated by the omnipresence of both horns of a dilemma in the culture. For instance, children at school are all the time confronted with the apparently opposing directions of developing independent thinking but following the teacher. Indeed, as Simmel pointed out: "Childrearing tends to be imperfect because with each of its particular acts it must serve two opposed tendencies: freeing and binding" (Simmel 1918/2010: 177). In a relationship, the couple is all the time dealing with the opposing tendencies toward being independent individuals and being bounded by living together. Americans are caught in the "Dilemma about the social and legal rights of African-Americans and other racialized groups in

this culture" (Amsterdam and Bruner 2000: 248). Nevertheless, culture provides a range of acceptable/inacceptable working compromises between opposing tendencies that culture itself has generated and encoded.

> Life in a culture is governed by a never-quite-resolvable tension between opposing, sometimes incompatible stances toward the world. These stances usually divide into those that are *canonical*, having to do with how things ordinarily are and should be, and those that are *imaginatively possible*, projecting how the world might be under altered circumstances. The dialectic between the two is endless, inherent in the demands of living communally, and reflects itself in law as elsewhere (Amsterdam and Bruner 2000: 283–284).

The problem, which Bruner is deeply and painfully conscious of, is that the very same dialectic can lead not only to positive outcomes. The legal culture can help the advancement of human rights, but can also lead to the racial segregation or to other aberrations. The Wannsee Conference in 1942 is an example of the latter, where senior officials and jurists of Nazi Germany developed a legal framework for the implementation of the final solution to the "Jewish question". If law, just as any other human activity, can envisage both directions is because "which consequences—and therefore which choices—one regards as tolerable or intolerable will necessarily depend in part upon one's values, faiths, and beliefs about the way in which human beings should be treated. Second, law is adversarial. To take a position in relation to most legal subjects that have any interest at all is to occupy a position on a battlefield" (Amsterdam and Bruner 2000: 6). But no matter which choice we make, Hamlet teach us that there always be some ghost to remind and interrogate us in order to give account for our actions. Here lies all the tragic universality of Hamlet's monologue in act 3 scene 1. Not just because of the personal dilemma between action and resignation, duty and desire, but also because the cultural system of values and consequences makes both available at the same time, requiring a positioning. "With a bare bodkin? Who would fardels bear" (Raffel 2003: 98): the same bodkin (dagger) can be used to either kill Claudius or Hamlet himself, and the consequence, the fardel, the "therefore" depends upon a complex interaction between the person and the context. Yet both choices would perfectly make sense in a human trajectory.

Conclusion: Ambivalence, Dilemmas and Imagination

It is said that we cannot choose nor our parents neither our culture. We simply find them there when we are born. Contrarily to what any socio-deterministic theory would suggest, the cultural context represent a source of ambivalence and dilemmas rather than consistency. As I have tried to argue, culturally framed experience is inherently filled with ambivalence and dilemmatic aspects to the extent that, in the individual perspective, taking a stance immediately evokes a non-actualized field of alternatives. On the other hand, culture encodes and

partially constraints this process, which is nonetheless always open to elaboration. The Oxford Dictionary, at the "Dilemma" entry's usage states:

> At its core, a dilemma is a situation in which a difficult choice has to be made between two or more alternatives. More informally, it can mean 'a difficult situation or problem' (as in the insoluble dilemma of adolescence). Some traditionalists object to this weakened use, but it is recorded as early as the first part of the 17th century, and is now widespread and generally acceptable[1]

The definition evokes the idea of constraints, that can be more or less pressing. Without such constraints, there would be no dilemmas. This is the utopist view of a free-men's society. One could object that when I have my coffee at breakfast, there is no dilemma, no need for sense-making, because there is no constraint, and the choice between having a coffee or a tea is not Hamlet-like at all. While, of course, it cannot be said that every situation is dilemmatic at highest, I think that the ambivalent and dilemmatic nature of experience emerges when we are dealing with "the way in which human beings should be treated" (Amsterdam and Bruner 2000: 6).

> I think of Self as a text about how one is situated with respect to others and toward the world-a canonical text about powers and skills and dispositions that change as one's situation changes from young to old, from one kind of setting to another. The interpretation of this text in situ by an individual *is* his sense of self in that situation. It is composed of expectations, feelings of esteem and power, and so on (Bruner 1986: 130).

Very few are the situations in which we are confronted with clear and distinct ideas of the others, their beliefs and choices: conceptualizing ambivalence in terms of oppositions is a form of structuring in itself. The others acquire value in relation to the person's continuous striving for what's next. The basic processes that guide the relationship with the other are categorization, narrative and argumentation (Amsterdam and Bruner 2000). These processes operate in a bilateral way from the self to the culture and backward. On the one hand there is the movement that goes "I am Italian (professor, male, democrat, father, etc.) *therefore* I will behave in this way". On the other hand there is the movement "I behave in this way *therefore* I am Italian (professor, male, democrat, father, etc.)". Both movements can be *canonical* or *imaginatively possible,* both are affectively connoted and imply costs and befits, as Hamlet shows us, but not in an economic sense. The same applies to the others' self-text. As Amsterdam and Bruner (2000) warn us, we must be very careful about the consequences of constructing a text about how human beings must be treated. For instance, deciding about death penalty for underage or mentally ill people implies a questionable system of categorization, psychological and educational theories about agency and development, but also theories about justice and guilt. Culture probably provides values and arguments for both stances, but not as a logically consistent system of propositions. It would

[1]Entry: Dilemma. Oxford Dictionaries. Oxford University Press. http://www.oxforddictionaries.com/definition/english/dilemma (accessed May 14, 2015).

look more like a dilemmatic field, in which indeterminacy and ambivalence trigger the possibility of different courses of action. We can have a system that at same time values the protection of childhood and allows the execution of and underage producing knowledge and artifacts to make both things possible. What Jerome Bruner is reminding us all the time, is that until we keep this ambivalence implicit, we tend to naturalize some options and imagine others, thus establishing a hierarchy between conventional and imaginative. But, at the same time, the very dilemmatic and ambivalent nature of experiencing provides the necessary degree of uncertainty that makes possible to people to find different courses of action. Every time we use imagination, it can lead to such a naturalization or to its opposite. As with the idea of Fate (Bruner 1979), human imaginative function led to its naturalization, but later in the history of civilization, the same imaginative function allowed to open new scientific and philosophical horizons that questioned the very idea. The same process occurred with many of the concepts social sciences developed about human nature. For instance, the same naturalization of ideas such as heredity, race, capitalism, communism or fascism led to the production of aberrant actions of systematic slaughter and oppression.

What I personally learnt from the work of Jerome Bruner is that ambivalence, dilemma, imagination and uncertainty are not ghosts to be afraid of, but useful fellow travelers in the fantastic journey of being human by, with Hamlet, “embrace it freely; And will this brothers’ wager frankly play”.

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Intersubjectivity: Commentary on Intersubjectivity

Waldomiro J. Silva Filho

To the memory of B.B. King (1925–2015).
*"***Pina Marsico***: Here in place there is another… following your point, another element in place I think, which is the intersubjectivity?*
Jerome Bruner*: That is so fascinating.*
Pina Marsico*: Yeah, I'm still searching for an explanation of intersubjectivity.*
Jerome Bruner*: I think it is a condition, it's a condition of our species. Intersubjectivity. It's the fact that I feel I can get inside your head and I feel that you are getting inside mine and I love it, I mean."*
(Interview with Jerome Bruner, 26th January 2015 NYC, NY, USA).

Intersubjectivity: "Psychology's Next Chapter"

1. Jerome Bruner has never written a book or an article specifically dedicated to the theme of "intersubjectivity", however, it is undeniable that one of the central points of his work (and of his inestimable contribution to Cultural Psychology) is the idea that reality is intersubjective: we make sense of the world through shared signs, beliefs and cultural values. One of his best known books, *The Culture of Education* (Bruner 1996), for example, focuses on how people construct "realities"

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based on narratives and *common* cultural symbols through social interaction. In the last chapter of this book, significantly entitled "Psychology's Next Chapter" (Bruner 1996, pp. 160–185), we read:

> This 'next chapter' in psychology […] is about 'intersubjectivity' – how people come to know what others have in mind and how they adjust accordingly. It is a set of topics that, in my view, is central to any viable conception of cultural psychology. (Bruner 1996, p. 161)

Although Bruner often discusses the "construction of reality" (or realities), "the creation of worlds", or "different cultures", the meaning of intersubjectivity is not committed to any relativist theoretical position—as if reality were a simple matter of perspective. We recall that the main thesis of relativism is that there are many realities (cultural, moral, linguistic, scientific, etc.) of incommensurable construction (Hales 2011). Bruner does not address this. For him, intersubjectivity relates to the human condition, which *constitutively* enables us to access, interpret and know the minds of others while, at the same time, allowing us to create common signs and to transact "through the use of language" (Bruner 1986, p. 57).

2. In the contemporary debate, the notion of intersubjectivity has become very popular in Philosophy and in Social Science, mainly through the significant influence of Phenomenology (Crossley 1996; Luft and Overgaard 2011). The question originally addressed by Phenomenology was a criticism of the moral and epistemological consequences of *solipsism*, which emerged as an undesirable residue of certain modern philosophies dedicated to investigations of the nature of subjectivity and consciousness—a solipsism that, strictly speaking, concluded that the only thing that we can really know is our own mind and the immediate data of consciousness (Bouveresse 1973).

Investigating this same horizon of issues, for Husserl (1960) and his *transcendental phenomenology*, intersubjective experience has a founding role in the constitution of ourselves as subjects that exist objectively, other subjects that also exist objectively and the space-time world. We can conceive of ourselves as subjects precisely because we are originally thrown into life within a intersubjective reality. And, as subjects, our experiences are marked by *empathy*, since, from the first instance, we attribute intentional acts to other subjects and through this we are capable of putting ourselves in their place and having the experience of the same meaningful world (Coplan and Goldie 2011). The very difficult and technical concept of "lifeworld" (and not of the natural world independent of human life) is the space in which the members of a human community (cultural, linguistic) experience common objects, as a value, a thought, a tool, a history.

In its criticism of solipsism, the Husserlian notion of intersubjectivity brings a new perspective to our understanding of collective human phenomena, through the "human interworld", "a world of shared meaning which transcends individual consciousness" (Crossley 1996, p. 4). Thus, interest in intersubjectivity refers to the concrete self-other relation, to the socially structured lifeworld or to our ability to share common reasons to justify beliefs within the ambience of our relationships with other people (Zahavi 2011).

3. Supported by extensive empirical research and a profound knowledge of the philosophical themes, Bruner provides a perspective of the notion of intersubjectivity as a phenomenon that is found in the "mutual sharing of assumptions and beliefs about how the world is" and "how we know Other Minds" (Bruner 1986, p. 65). Here we have three principal elements: a self (dynamic and not an isolated ontological entity), a language (as a practice, a use) and the minds of others (with whom the self maintains transactions). At this point, Bruner approaches an important theoretical movement in the field of the Philosophy of Language, featuring authors such as Paul Grice, Dierdre Wilson, Dan Sperber, Nelson Goldman and Gareth Evans.

A significant part of Bruner's work has been occupied in focusing "on growth in human infancy and particularly on the development of human language and its precursors" (Bruner 1986, p. 59) in the context of a cultural experience (Bruner 1983). In some of his studies he has been interested in how children organize their attention in the environments they share with other people. Bruner notes that in the first year of life, "children are already adept at following another's line of regard to search for an object that is engaging their partner's attention" (Bruner 1986, p. 60). This kind of performance requires a complex and "sophisticated conception of a partner's mind". The way in which children begin to use deictic signs, for example, such as pronouns and demonstratives, involves their capacity to understand their position in relation to others (when the child uses the word "I" and understands that other people use the same word to refer to themselves).

At several moments, Bruner presents criticisms of some of the concepts of Developmental Psychology—either focused on strictly biological processes or resorting to the idea that development begins at a position marked by an "egocentric perspective", "privacy" and "unmediated conceptualism". Bruner (1986, p. 61), does not, in fact, mean to suggest that these theories are mistaken, but only that they resort to an arbitrary, partial formulation and reflect a specific cultural bias. For him, on the contrary, an investigation into the formation of a person (and of a typically human mind) needs to begin by considering that the characteristic features of our mental life may only be described if we are living with other people, if we are sharing and communicating our experiences under the regime of a language and a symbolic and cultural horizon. This means that "culture shapes mind, […] it provides us with the toolkit by which we construct not only our worlds but our very conceptions of ourselves and our powers" (Bruner 1996, p. x). For this reason, the scope of Cultural Psychology itself presupposes a comprehensive sense of intersubjectivity.

Narratives

4. In the interior of the rich, indeterminate and confusing domain of human interactions, we create a lifeworld, which is inhabited by experiences and achievements in the form of narratives, such as histories, stories, myths, reasons, ideologies—in

two words, a form of *narrated stories* (Bruner 1986, 1990, 1991, 2002). For Bruner

> We are so adept at narrative that it seems almost as natural as language itself. We know how to tailor our stories quite effortlessly to further our own ends (beginning with those sly twists that shift the blame for the spilt milk to a younger sibling) and know when others are doing the same. Our lives with stories start early and go on ceaselessly: no wonder we know how to deal with them. (Bruner 2002, p. 3)

Narrative, in fact, is a conventional resource for the constitution and transmission of the human world.

Unlike strictly scientific and factual knowledge, which seeks to base itself on the objective criteria of truth/falsehood and on empirical verification, narrative constructions may only satisfy "verisimilitude", in that they are a presentation of a reality whose acceptability is exclusively governed by "narrative needs" (Bruner 1991, p. 4): the significant coherence of our experience, the need to communicate an understanding of the world and to understand others and ourselves. Narrated experience is inherently significant and human action finds within it its possibility, justification, end:

> Insofar as we account for our own actions and for the human events that occur around us, principally in terms of narrative, story, drama, it is conceivable that our sensitivity to narrative provides the major link between our own sense of self and our sense of others in the social world around us. The common coin may be provided by the forms of narrative that the culture offers us. (Bruner 1986, p. 69)

In other words, the study of narratives is not just an investigation of narrated fact, but of how "we make worlds" (Goodman 1975) and how "we make ourselves" (Bruner 2001). For this reason, even when we talk about narratives that refer to collective experiences or long periods that go beyond the an individual's lifetime—such as a saga, for example—the narrative expresses that person's perspective about things and events and about his place within the plot.

Indeed, verbalizing, becomes a narrative object, involves the subject in assuming the role of the author-narrator from a specific perspective, at a certain time, in a certain scenario, and so forth. But it also means assuming the position of listener/audience of the narratives of others. The very idea of *selfhood* is one of these verbalized events. We talk of *selfhood* when the subject decides:

> to enter into transaction with others linguistically and by what exchanges, how *much* we wish to do so (in contrast to remaining "detached" or "silent" or otherwise "private"), will shape our sense of what constitutes culturally acceptable transactions and our definition of our own scope and possibility in doing so. (Bruner 1986, p. 66)

This is a kind of event that imprints meaning, singularity, coherence and continuity on experience, in a process that Bruner calls *self-making* (Bruner 2001, 2002, p. 73). And for this reason, from the perspective of narratives, the self is not generally something immediate containing a glassy essence, but something that occurs and is constructed through circumstances, contexts and interactions, in real and imagined time… with others.

Triangulations

5. Here, Bruner is, to some extent, approaching other authors, such as Donald Davidson, Hilary Putnam and Tyler Burge, and an anti-individualist or externalist perspective of the mental state (Kallestrup 2012). Mental states, from this perspective, are not private and internal states, whose connection with the world may be placed in doubt, nor are they states totally "outside the head", which depend on the chemical and physical properties of the referents of the terms of natural species. For this reason, Davidson withdraws from this mind-world opposition and suggests an approach that he calls "triangulation" (Davidson 1982). For him, our knowledge of what is objective requires, in the first place, two creatures, each interacting with an object: what provides each of these creatures with the concept of the object (of how things are objectively) is the line formed by the interaction between them, through language. The fact that they share the concept of an object (and consequently the concept of truth, of true belief) makes sense of the assertion that they have beliefs and are capable of thinking about objects in a public, intersubjective space (Davidson 1987, p. 105).

The individuation of beliefs and thoughts, as well as of means and concepts, may only be conceived through the systematic causal connections in the triangulation between the individual, the other speaker with whom he is interacting and the objects or events in the world. For this reason, Davidson says that we cannot first identify beliefs and meanings and only then ask about what produces or causes such beliefs and meanings (Davidson 1983, p. 150). This not only shifts the question of the cause of the subject-object relationship to the common cause within the intersubjective context. It also considers that our beliefs, principally our more basic beliefs about the world, in part emerge from our causally rooted existence in the world (provided by our senses), as well as from our familiarity with the character of this causal root. For this reason, the causal-perceptual connection has three elements, instead of only two: one which links me to my interlocutor; one which links me to the event or entity that is the object of my belief or attitude; and another which links my interlocutor to the same event or entity.

Triangulation is an empirical event which occurs exclusively in one situation: when at least *two people converse*. Triangulation depends on the way in which the speaker, the interpreter and the object or event appear together in a certain linguistic and environmental context, since it expresses the conjunction of these elements.

6. This sharing of causal interactions is not determined by the world itself or by the norms of the linguistic community. Triangulation emerges in the initial situation of language learning. In Bruner, we see that the acquisition of language and the formation of a self who experiences "transactional" processes mobilizes a type of performance peculiar to human subjects.[1] For the child, learning the syntax of a

[1]Inspired by the works of Bruner, Trevarthen (1979) conducted studies on children using two notions of intersubjectivity: primary intersubjectivity (the child in a face-to-face interaction with an adult) and secondary intersubjectivity (the child in a triadic interaction with another person and another object).

language, for example, means adopting the same rules as other people and "that the mind is being used by others as we use it" (Bruner 1986, p. 62). In this way the referential use of signs also requires the difficult elaboration of utterances that indicate and highlight the salient and relevant features in a continuous world and activate common assumptions and shared contexts between the speakers (Bruner 1983, pp. 65–87). On this point, commenting on the work of Gareth Evans, Bruner writes:

> … referring to something with the intent of directing another's attention to it requires, even at its simplest, some form of negotiation, some hermeneutic process. And it becomes the more so when the reference is not present or accessible to pointing or to some other ostensive maneuver. Achieving joint reference is achieving a kind of solidarity with somebody. The achievement by the child of such "intersubjective" reference comes so easily, so naturally, that it raises puzzling questions. (Bruner 1986, p. 63)

Thus sharing rules and a common world are at the core of language learning. This implies that learning how to use a language is a process that includes, to the same extent, the act of learning the culture, learning how to significantly express oneself to other subjects and learning to interpret the expressions of these other subjects.

Now, the learning that confers meaning on the most basic phrases necessarily involves the teacher (who may be a community of speakers with no pedagogic intentions or an individual person), the learner (who may be beginning a first language or consciously trying to decode a new language) and a shared world. Without the shared external world, there is no way for the learner to discover how talking connects with the world. Without the other person, nothing would give content to the idea that there is a difference between understanding things correctly and understanding them incorrectly. Only those who share a common world in this way can communicate with each other; only those who communicate with each other can acquire the concept of an objective and intersubjective world (Davidson 1994, p. 234).

Human, All Too Human

7. The idea of the objective world and of objective truth may sound like metaphysical realism. But the sense of objectivity here is disconcertingly simple, even vulgar: our propositional attitudes are objective, not because they were shaped in the light of some empirical proof, but because they are true or false in *conversation* with others.

A belief, as with other propositional attitudes (thoughts, desires, hopes), may not be understood, in any possible sense, as a state that is separated from the world and that, later, needs to be reconnected to that world. It is through our beliefs that we describe, indicate, assess and explain the world. Ultimately, we create our narratives through our beliefs. For all these reasons, we are led to believe that the theoretical speculations around the notion of intersubjectivity contain within them

more than a theoretical value, a moral value, some form of praise for the previously open and dialogical nature of the experience. It is dialogical in this sense: a practice steeped in language born out of the meeting (as well as out of the failure to meet, of disagreement, conflict, confluence) of narratives, but above all out of intersubjectivity as the ability to "read other minds" (Geertz 2001, p. 23).

Our ability to understand others and to make ourselves understood by others (as in the case of the referential use of signs at the most tender age) is the result of the abilities that nature provides us, of the cultural order that we join and of the interactional process with each of those with whom we live throughout our existence. *This is not the only result*, however. It is also an inexhaustible source of vitality, of hope, of creation, of tolerance. The "world has gradually become so wonderfully bright, terrible, profoundly meaningful, soulful, and has taken on color", wrote Nietzsche (1878–1880, p. 27), "but we have been the colorists".

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Part II
Navigating the Bruner's Ocean

Homage to Jerome Bruner

Howard Gardner

As we celebrate your 100th birthday, I think back to when we met, exactly fifty years ago. You were already a legend: in psychology, in education, in broader intellectual circles, a personality in Cambridge, Massachusetts, and in a good many other corners of the world. As my Harvard student contemporary Andrew Weil phrased it in a Harper's Magazine portrait at the time, *Harvard's Bruner and His Yeasty Ideas*. Your achievements before the age of fifty were already stunning; and they gained in significance because they emanated from a man who was blind for the first years of life, who required enormous corrective lenses throughout life, and who in so many categories was not only "the first person to…" but also "the first Jewish person to…"

That we met when we did was an incredible coincidence. Having finished Harvard College, as a protégé of Erik Erikson's with an interest in psychological disorders but no interest in attending medical school, I decided to visit the University of Michigan's well regarded graduate program in clinical psychology. I would probably have taken a bus from Cambridge to Ann Arbor, but happened to catch a ride with David McNeill, a young postdoc who had been working with you. As David learned of my interests (no doubt, we both needed stimuli to stay awake as we motored through Ohio), he thought that I might enjoy meeting you—Jerry Bruner—and possibly working with you on a new curriculum for middle school called "Man: A Course of Study." Rather like Woody Allen casting a minor role, you, Jerry, chatted casually with me for a few minutes and said to your

Howard Gardner
Harvard University,
Cambridge, MA, USA

associate Annette Kaysen, “Please offer Howard a job on the Educational Services Incorporated (ESI) Project.”

To say that this was the most important moment in my personal and professional life would be more understatement, than hyperbole. Jerry, you had also hired Judy Krieger to work for you that summer. Judy and I fell in love and within a year we had gotten married. Judy and I had three children, Kerith, Jay, and Andrew, and in a non-literal sense you are their godfather. You also played a paternal role in other ways; suggesting that they attend the Shady Hill School, making it possible for Dr. T. Berry Brazelton to be their pediatrician, and above all, serving as Judy’s mentor and thesis adviser.

It would take many pages to lay out the multiple ways in which you have shaped my professional career—in terms of the topics examined (creativity, intelligence, developmental theory, the role of community in education, thinking ‘by the left hand’); the ways in which I study and write about these topics; and less evident to those who have not worked with both of us, how I work with and relate to my close associates at work.

Indeed, I have a confession to make—about ‘the anxiety of influence’. For quite a few years, your influence on me was so powerful that I was not able to recognize it consciously. Call it repression, call it forgetting, calling it unconscious resistance, I developed ideas and used phrases which I had absorbed from you. I hope that, once I became aware of this unconscious borrowing, I spoke and wrote about my debt with sufficient clarity that I’ve earned your forgiveness.

As I write, Jerry, you are about to turn 100. And while your mobility is not quite was it was a few years ago, you are still in many ways ‘the youngest and the most eager member of the class,’ an inspiration to all who know you and many who only know ‘of’ you.

It cannot be accident that we have both been attracted to and spend decades visiting the small city of Reggio Emilia, in Northern Italy. We go there, not only because of the wonderful atmosphere, food, and citizens, but also because we are looking for existence proofs of how human beings can mobilize themselves in a positive direction. (Alas, we have plenty of existence proofs of how human beings can be destructive.) That’s the reason you threw yourself into the creation of Man: A Course of Study, advised at Shady Hill School, collaborated with the Underwood School in Newton, and taught (both solo and team) for decades at Harvard, Oxford, and most recently the New York University Law School.

When you conceived the magnificent curriculum “Man: A Course of Study” you posed three pivotal questions: “What makes human beings human? How did they get to be that way? How can you be more so?” As in so many other things, these three questions not only excited the 10 years olds who were absorbing the curriculum; they also became a watchword for my own pursuits during the past half century. Jerry, more than any other scholar in our time, you have helped to conceptualize and answer this trio of big questions. You have always had it in

mind to improve human capabilities whenever possible. You seek excellence, do your best to realize it in every aspect of your life, and have inspired uncountable others to do the same. What a role model for us all, for our students, and "grand-students", indeed for thinking and thoughtful persons everywhere!

The Purpose of Purpose

Jaan Valsiner

> *[at Duke] I was adopted by… Psychology faculty, and even given my own laboratory for my research. It was not only Zener, Adams, Lundholm, et al., but also the great William McDougall. There I was, not yet twenty, adopted as the promising bright kid. And the graduate students in psychology, sociology, and anthropology formed a kind of brotherly/sisterly group and took me under their wing. And it was the lot of them that tempted me to go on to Harvard for my graduate study.*
>
> Jerome S. Bruner in response to Giuseppina Marsico, February, 2, 2015, on his undergraduate years at Duke University.

Meeting between generations is eye-opening. When I met Jerry Bruner for the first time—in Moscow in December, 1975—we, the young students who got to meet him outside of the "official mission" of his in Moscow,[1] were utterly fascinated by his inquisitive mind and in his interests in our research efforts. Jerry made it his

[1]Which was—to visit his friend Alexander R. Luria and, aside from that, deliver a few lectures at Moscow State University. Thanks to his "official" translator—Bella S. Kotik—then a Ph.d. student of Luria's—we could "kidnap" Jerry for an encounter in the student dormitory room of Ekhtibar Dzhafarov in the huge Moscow State University building where we discussed our passionate ideas for new kinds of psychological investigations. The feeling of equality of intellectual search that was created by Jerry in that encounter stayed with us for decades, and allowed us to maintain intellectual sanity in the corridors of power of academic institutions, East and West, that often sacrifice the search for knowledge for the glory of feelings of importance of the recognized scholars and their honorary degrees.

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purpose to carefully inquire into our ways of approaching complex research issues—in the fields of visual perception and mother-infant interaction. His questions were suggestive for further thinking—they opened our eyes to new options, and never focused on the prominence of the sailor who had been crossing the Atlantic on his yacht (Marsico 2015, this volume).

The general developmental orientation that has been the hallmark of all of Jerry Bruner's many contributions to science and humanity is something that the various sub-disciplines of psychology still need to acquire. The basic axiomatic stance that involves a three-part set of basic ideas:

(a) human psychology is a science of human conduct (rather than behavior),
(b) such conduct unfolds in irreversible time, and
(c) the conduct is constructed by goals-oriented agents (persons) who posit a future state of possible affairs *and then proceed to construct* it—remains largely undifferentiated in various empirical investigations. Agency is a necessary starting point for understanding human conduct—there is no structure of any human invention—external or internal (subjective)—without its maker.

In this re-focusing on the agency, the work in *hormic* psychology of William McDougall whom Bruner considered as one of his most esteemed teachers during his Duke years. *Human conduct is purposeful*—this simple statement creates a serious theoretical problem for psychology. Theory building in psychology is not used to include agency—it "smells" the importation of the uncontrollability of the "free will" of human beings. Yet the subjectively constructed notion of such "free will" re-emerges in the thinking and actions of human beings all the time—despite being outlawed in psychology courses and textbooks. People think about their own and their children's futures, they become frontline actors on battlegrounds, space flights, and suicide bombings, and arrange candles for intimacy of homes and dinners at restaurants.

The *Hormic* Psychology of William McDougall

Bruner's high esteem for his undergraduate teachers—with a focus on McDougall—is in many ways indicative of his later inclinations in the selection of his research interests. Psychology of purposefulness—or *hormic* psychology as McDougall called it—was in many ways an ill-born intellectual tradition in the first decades of the 20th century. It is only now—a century later—when our general theoretical thought dares to return to the basic tenets of purposefulness—without its theological implications.

William McDougall (1871–1938) was a British biologist and medical doctor whose work in psychology became prominent from the beginning of the 20th century. He was notably out of fashions in his country and in the field of psychology of his time—emphasizing Lamarckian ideas in an environment filled with neo-Darwinian mindsets and in psychology that turned increasingly focused on

discourses about behavior. In contrast, McDougall cherished vitalist and (later in life) parapsychological thoughts. Both of such ideations were then—as these would be now—damaging to the reputation of any serious scholar. Yet McDougall did not need to care—after surviving the fieldwork on the Borneo among real headhunters (Hose and McDougall 1912) the presentation of the mind to the symbolic ones was not too much of a threat, and even afforded asking treacherous questions (McDougall 1921). Participation in the Torres Strait Expedition of Alfred C. Haddon and William Rivers in 1898 was further act of widening the experiential basis for purposive psychology.

McDougall is also seen as a serious follower of William James' pragmatist orientation—that was crucial for his relocation from Britain to the United States (Harvard) in 1920. James' interest in the occult phenomena was no secret at his time. It is at the turn of the 20th century where psychologists could be fascinated by—and attempt to study—human existential phenomena of substantial depth: occult, religious experiences, and to confess that Dostoyevsky was by far more important a psychologist than Isaac Newton despite the impacts of any falling apples. Psychology was still disputing the wisdom of becoming a natural science of no concerns for the specific nature of psychological phenomena. McDougall's witty description of behaviorism in American psychology as "*the most misshapen and beggarly dwarf*" (Pattie 1939, p. 307) was part of that disbelief that simplistic fashions can capture the minds in a developing science. They can—as our contemporary fascination with anything labeled "evidence-based" or "neuroscience" show. The discipline has much to learn from its own social history.

For McDougall all *re*-actions by living matter were *pro*-actions—they had to do with sustaining and enhancing the life of the organism. In this his perspective went beyond that of Lamarck—it was not merely the inheritance of acquired characteristics that was to be documented by science, but the creation of new states of being through organism's purposive actions upon the environment. Goals-orientations set the stage for the future, while being based on the past. Instincts would be the first "building bases" for the *propensities* for the future. Propensity entails both the creation of the goal projected as desired onto the future, and then—efforts to achieve these. *We exist as we plan*—and make some of the plans into realities. As human beings we may develop social discourses that allow us to reflect upon our purposive actions. However—our capacity to reflect upon our purposes is not equal to the actions themselves. Purposive action can be "covered up" by talk about it—which may deny it, re-present it in various forms, or may fortify it.

Setting the Theoretical Stage: Roots of Purposefulness

The notion of purpose necessarily needs breaking of symmetry (Fig. 1a, b). Such symmetry breaking occurs in irreversible time already at the level of chemical phenomena:

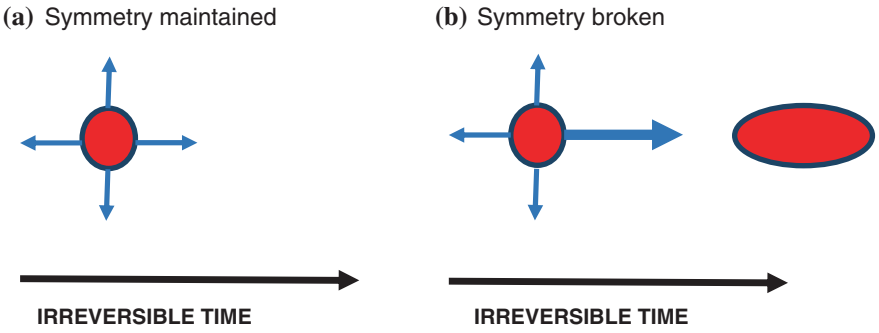
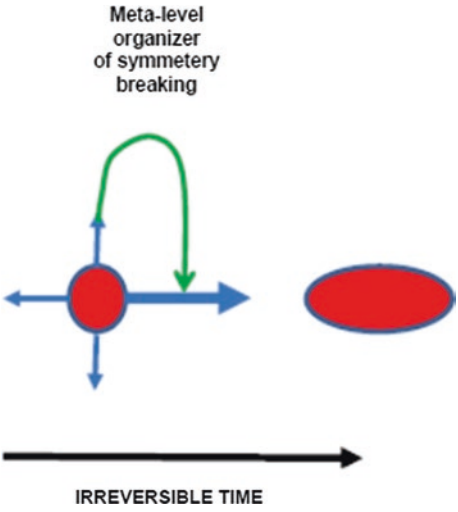


Fig. 1 Breaking the symmetry. **a** Symmetry maintained, **b** Symmetry broken

Fig. 2 Purpose as organizer



> If the world were built at the image designed for reversible eternal systems by Galileo Galilei and Isaac Newton. There would be no room for irreversible phenomena such as chemical reactions or biological processes.
>
> For unstable systems, which have a privileged time direction, we see a dispersion of the initial volume in phase space. Then we cannot impose initial conditions which would force an ensemble of points to concentrate on a single point. The future remains open. (Prigogine 1987, p. 102)

In the higher levels of structural organization of phenomena—those of complex systems—such symmetry breaking is the rule. Figure 1 illustrates an abstract contrast between equilibrated self-maintained balanced system (Fig. 1a) and that of inherently imbalanced one (Fig. 1b).

Purpose is thus a generalized meaningfulness—in terms of the organism-environment relations—that provides the context for other meaningful actions. In the abstract sense it is depicted in Fig. 2. As a generalized meaning, purpose gives a basis for the imbalancing the current equilibrium of the vector system. This is

the rule for development of any system of open kind—from biological systems upward. The world of living systems includes purposefulness. It is an inevitable part of such systems that need to pre-adapt themselves to indeterminate future conditions.

What is depicted in Fig. 2 is the general way of regulating by the open systems of their own relations with their environments. The construction of the meta-level regulators is system-centered—the organism acts upon the *current* state of the *Umwelt*, changes it, and sets up the conditions for its own transformation into a novel form under new conditions of the *Umwelt*. In this formulation, all "environmental conditions" have their "effects" upon the organism *exclusively through the activity of the organism itself*. In order for the "environment" to "have an effect" on the organism the organism needs to "cooperate"—in terms of establishing and maintaining a relation with the environment. The organism is the center of its own *Umwelt*, and its relations with it guide its further transformations. In contrast—the environment has no agency. Agency is only possible in the case of open systems and is the property of such systems.

The human case adds to this general meaningfulness of organism-environment relations the reflexivity made possible through semiotic mediation. Human psychological development is possible only under the conditions of such symmetry breaking and its corresponding construction of unique novel forms of *meaningful* conduct (Valsiner 2014). This takes the form of growth of the regulatory systems (Fig. 3).

The second level of regulators of the purposefulness that operates in the human case—that of signs—can operate on the basic biological purposiveness in multiple ways:

1. *Maintenance* of the original (organismic) purposefulness.
2. *Inhibition* of the original purposefulness—in the form depicted in Fig. 1a.
3. *Amplification* of the organismic purposefulness.

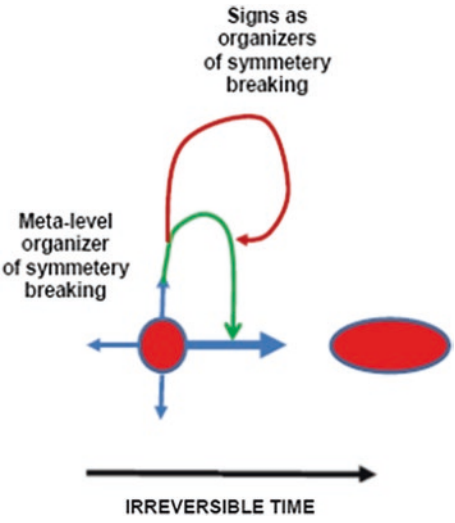


Fig. 3 The human case: semiotic regulation of the symmetry breaking

The general property of living systems is amplification of variability (Maruyama 1963), and the human case adds to it further escalatory/de-escalatory process due to the function of signs. Signs operate as boundary setters for maintenance, inhibition, and amplification of the inherently purposive action of the organism within irreversible time.

Maintenance is present in every instance of signification of the ongoing process in specific direction—*away from* the equipotentiality of the given status quo (e.g. Figure 1a). It entails human self-assertions ("*I can*") in the beginning or in the course of some action. The contents of such assertions as these are produced is always unclear—before the goal is actually achieved, statements of such kind have no meaning outside of the ongoing action scheme. Or—their meaning is in the maintenance of the action direction. Interpersonal versions of such assertions are even more profound in their pre-final emptiness—a politician shouting to a crowd of followers "Yes, we can!" is not a statement of fact (or measurement of competence) but a call to action—at times under high uncertainty. A waiter in a restaurant who approaches the eating performers towards the end of the meal with the question "*Is everything OK?*" is guiding the actors towards accepting the assertion *("yes it is")* rather than producing a list of insufficiencies in the ongoing alimentary activity. By putting the respondent in a position that privileges a particular answer the meaning of the act becomes maintained and enhanced in that direction.

The function of *inhibition* of the purposiveness by signs can entail the denial of the very purposive nature of the given act. It can create masking of the context-dependency of the purpose. Ontological statements ("X is Y"—"John is introvert") eliminate both the spatio-temporal context ("X is Y in the context of Z"—"John is introvert when having to face the small talk at a cocktail party") and the goal-oriented nature of the observable state of affairs ("X is Y because this leads to Z"—"John is introvert when at a cocktail party as he thinks this appeals to the beautiful women in the surroundings"). Likewise, signs can inhibit the ongoing purposive action—a woman who is about to enter into an amorous liaison with a young man stops the initiated action reminding to oneself "*I am not that kind of a woman*" (Nedergaard et al. 2015). Socialization efforts within any institutional context are oriented towards promoting the development of internalized self-regulation systems that would inhibit some of the purposive actions *before* the movement towards the emerging goals is triggered. Or even more profoundly—human beings can rule out the creation of some of the possible goals, while maintaining and escalating others. Some purposes are ruled out before they are given an opportunity to emerge.

Finally, the purposiveness of human actions can be *amplified* by signs. Ordinary acts directed towards some immediate goals—accepting a piece of bread in one's mouth or drinking a sip of red wine—can become signified as "sharing the body of Jesus" and "drinking his blood" in some religious rituals. The role of such—manifestly cannibalistic—acts is to escalate the communion with the religious framework and enhance the symbolic ties of the person with the belief system. Most mundane everyday acts of purposeful kind—washing the dirty clothes of one's child, preparing a meal for another person, or joining a crowd—can be

imbued with escalated and hyper-generalized meaningfulness that escalates the meaning of the given act beyond the here-and-now context.

The Purpose of Purpose: Reaching the Age of 100

We are all mortal—but before that—we strive towards future goals within the pathway of our life course. The round numbers of our birthdays—including the symbolic number of "100"—are merely markers of the purposive nature of human living, however long it may last. It is no coincidence that Jerry Bruner was fascinated by the searches of the scientists at Duke at around his 20th birthday—like he continues his youthful purposiveness as nearing 100. His "round number" gives us a boost in our search for new meanings in our lives, striving towards experiencing our worlds in ways that are curious, productive, and innovative. The ethos that Jerry Bruner has carried with him all through his life—that of alertness to the new, to new potentials for development, and capacity to go beyond the information given—become purposes for opening the research efforts in psychology and linked disciplines to innovation of ideas. There is a directed purpose in our purposefulness.

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How Bruner Foresaw a Future That Has Yet to Be Achieved

Rom Harré

For a change in the state of the world to be of psychological consequence it must be meaningful to those who are aware of it. This seems too obvious an axiom of any possible psychology that its neglect or setting aside by people purporting to be psychologists is nothing short of amazing. Meanings are not determined by the physical properties of whatever people are aware of but by social convention and custom or by deliberate individual assignment of meaning that catches on or for which the assigner is conceded to be the authority to determine meanings. But what is it that is thus assigned? It cannot be a mysterious accompaniment to the sign noticeable only to those who know its meaning. For thus to display the meaning of a sign we would need to know what the accompanying something meant, and so on. We are thus no further forward by introducing the idea of meanings as entities.

The having of meaning is intentionality—the very attribute that Bruner (1976) in his famous TLS article deplored the inattention to and neglect of by psychologists. The same sign may mean different things to different people but it may mean also something different to the same person depending on the situation in which it occurs and by whom it is presented and by whom it is perceived. Yet a system of signs is only important in a culture if just about every aspect of importance in the interpretation of these signs and in the ways they can be put together to form complex signs, is a matter of common practice.

Wittgenstein (1953) tried out a long standing idea, that the best model for all kinds of meaning is that of name and bearer. With the help of a simple but telling example he changed the focus of studies of meaning fundamentally. Meaning is

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not another something accompanying the something that is a sign as its meaning. Rather the meaning of a sign is the use to which we put it in a community of language users. The other people in such a community use the local repertoire of signs in sufficiently similar ways to each other uses that a community and a culture can grow.

But before we can delve more deeply into what it is to have a use in a culture we need to consider the more fundamental question—what makes a material something into a sign that is a sufficiently stable being to be the instrument for a certain range of uses in the life of a tribe. de Saussure (2011) suggested that a something is a sign and thus capable of being used meaningfully if its absence makes a difference to how people understand a situation. If the turning red of a light suspended above a road junction having previously been green makes no difference to the way the drivers in the area behave there it was not serving as traffic sign. Though what the specific meaning of such a change of color might be is determined by a separate act of meaning given.

Bruner's complaint suggested the SR psychology that had evolved from behaviorism systematically neglected the dimension of intentionality—so the distinctive psychological patterns that were the result of apprehension of the meanings of the phenomena under study were overlooked. However, the business of everyday life, reasoning, classifying, experiencing and displaying emotions, and so on all depend for their existence on meanings. What made a rush of adrenalin fear rather than anger was the meaning that the person assigned to what had impinged upon him or her. Bruner concluded that the notorious failure of academic psychology to have any useful application in everyday life, the classroom, the courts, the psychiatric hospitals, the sports field could be put down to the neglect of the very substance of psychological functioning, meaning. In grander terms this meant the neglect of the key property of intentionality.

In his autobiography Bruner (1983) describes attending the William James Lectures at Harvard given by John Austin (1973) in which he presented the concept of 'performative utterance'. In, not 'by', the utterance of such a string of words, interpreted as a speech act, under certain conditions. a social act is performed. It might be the sealing of an agreement, say a treaty. It might transform the social status of the parties engaged in some event, for example swearing in a Chief Justice. Before the ceremony this person is just another lawyer; after the ceremony he or she is the highest lawyer in the land. All that happened, in one sense, was the saying of certain words. Language is the means for the performance of many other social acts as well. Language is a device for doing things, though it has a role in describing things too. However, in the contexts of the episodes of everyday life linguistically carried acts, such as promising, insulting, apologizing, marrying, pleading and so on play a much more fundamental role (Austin 1973).

Bruner's Herbert Spencer Lecture, reprinted article in the TLS (Bruner 1976) received wide publicity—his friends nodding their heads wisely. But in the way that the swords sprang up after the dragon's teeth were sown, so those psychologists who had been continuing with the empty rituals of neo-behaviorism, Okaying statistics with stimulus-response events, proposed a debate. It was chained by

Brian Farrell, notably one who managed to profess both sides of the issue. There were eight sessions and the Brunerians clearly won the day. However, as has happened so often in the past thirty or so years the outcome was disappointing—the same muddled and inconsequential methodology persists.

Not long after this event Bruner returned to the United States. But the principle that intentionality is the core property which identifies a psychologically significant object, process or state of affairs has a further consequence and it seems to me that Bruner's turning to narrative as the second core notion for psychology is a more or less direct consequence of the recognition of the importance of attending to the intentionality of signs as the phenomena. But what is it that links meanings into chains of significance? Turning to the idea of rules was an earlier attempt to answer this question. Rules, though a useful metaphor, do not fit well with the essential spirit of the Brunerian spirit. His next move was to propose 'narrative' as the organizing principle that would correspond to 'causal mechanism' in the natural sciences. Life consists of stream of meaningful things and events ordered into coherent and meta-meaningful slices of life of episodes.

Narratology was already a well established discipline with the writings of Algirdas Greimas (1987) and many others working with the narratological principle that life was organized by story-lines. This approach is now at the heart of cultural psychology, a far better name for the movement that began many years ago as the misdescribed 'qualitative methodology'. The issue is not whether one collects numerical data, head counts, statistical averages and so on or whether one tries to catalogue and order the meanings and story-lines that constitute orderly flux of everyday life.

But how is this discipline *psychology*?

Bodies of knowledge and habituation as the residue of consciously followed rules, conventions and story-lines become second-nature, and look very like causal sequences. From the point of view of a science of psychology research of this kind might or might not result in patterns of meanings and convention that spanned different cultures, but perhaps not. We should expect not only for there to be culturally distinct psychologies in the sense adumbrated here, but also idiosyncratic systems of meanings and rules (story-lines), with an oblique light shone on them by similar cases—but do not expect them to have the same shape of anyone else's patterns of thought, feeling and action. Chemists can make these presuppositions, and even then with caution. The local conditions make huge differences the patterns of reaction of the very same elements and compounds.

These thoughts suggest that the moral dimensions of the contexts of thought and action may be crucial determiners of what goes on in interactions among members of some human group. Surely the most salient moral concepts for understanding people's actual choices of meaningful acts and the necessary story-lines to give them shape, are their beliefs about their rights and duties. Psychology should include studies of the way rights and duties are distributed in families and the means by which these distributions are effected, in communities and other institutions.

Since the prime instrument of thought and action amongst human communities is symbolic and particularly linguistic, thorough studies of the uses of certain words that are at the heart of ways of thinking of which they are to various degrees the instruments, example the studies of *psychologic* (Smedslund 1988). It is not an empirical question whether an ascription is something a person intends to do. Following Wittgenstein (1953) into the heart of culture we discern hierarchies of language games, practices that depend on the uses of language to accomplish practical and other ends. We try to bring to light the unexamined assumptions on which ways of life and the reasoning styles and standards that goes with them is implicitly dependent, the propositions and practices that Wittgenstein called 'hinges'.

In a sadly neglected but profound study of the limitations of computer modeling in psychology H. Maturana and F. Varela[1] set out the three aspects of meaning that are salient in any study context, be it history, jurisprudence or psychology. These are *historicity*—how have the meanings of a key word evolved—*indexicality*—in what ways have the immediate contexts of a use of word impinged on how it is then and there understood—and *contextualist*—how are meanings subtly transformed by the meanings of surrounding symbolic systems?

Even in recent research publication the question of meaning, the intentionality of the phenomena, is neglected. How do the authors of so many publications know what the people who took part understood by the vocabulary and particularly the key words for example in personality questionnaires? Furthermore, in any statistically based study only the main trend is reported and studied further perhaps. The 'odd man [woman] out' is usually struck from the record—but he or she took part and engaged with the activity of the 'experiment'. How far was this person's deviance from the common statistically generated and thus artefactual result affected by differences in the understanding of the words between the experimenters and this person, and indeed between the experimenters themselves?

Further research projects branch out from here. For example an extension of the largely intuitive work of narratologists in classifying and cataloguing the repertoires of story lines that are revealed in texts taken from different cultures, or as used by different people or in different circumstances. Vygotsky's (1979) conception of human development as gradual transitions of skills through the Zone of Proximal Development towards completion in the Zone of Actual Development is closely akin to Bruner's notion of scaffolding, the patterns of meaningful actions and practical acts in within which an infant develops as an intentional actor. Here too a wealth of research projects opens up, particularly in seeing how this progression works in different cultures and particularly in moieties of the 'same' culture.

We can sum up the core of Bruner's contribution to the creation of a truly scientific psychology and the struggles that his colleagues have had to pursue it by

[1]I once possessed a very fine book by Maturana and Varela which examined in depth the possibility of computational modelling in psychology. I gave it to the Bodleian Library in the 90s but it has disappeared.

paraphrasing his own words: 'George Miller and I brought cognitive psychology into being and then it was hijacked by the computationalists'. The upshot was the substitution of algorithms for story-lines and binary strings for meanings and the divorce of psychology from the human world of thinking, acting feeling and perceiving. The contemporary revival of Brunerian psychology as 'cultural psychology' faces a similar threat—the redefinition of psychological phenomena in terms of the chemistry of the nervous system, particularly of the neurotransmitters. Is depression a chemical phenomenon—say to do with the quantities of serotonin in the synapses? Ask someone who is depressed!

Jerry Bruner's professional inspiration and his personal warmth, encouragement and friendship have been important to me and, I am sure, to many others, who have tried to follow the same path of intellectual honesty, unwillingness to be swayed by popularity, and burgeoning creative invention.

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Jerry Bruner: The Oxford's Years and Beyond

José Luis Linaza

My first interest in Bruner's ideas came through his paper on "The Nature and Uses of Immaturity" (1972). I was puzzled by the lasting consequences that my handling of young rats was having on their adult behaviour (Boakes 1984). I was reading and thinking about the relevance of early experiences in adult rats. I suppose it touched on topics from my readings in Madrid, as a psychology student, of Freud, Bowlby, and other psychoanalysts. For me it was a difficult but extremely interesting paper. It linked psychology to anthropology, primatology, linguistics, etc.

I took the opportunity of a visit to Oxford to meet him. I had a meal with Jeffrey Gray, a leading figure in animal learning research, to discuss the possibility of joining his group as a doctoral student. I explained to him that I was disappointed with my work on rats' learning and more interested in exploring the consequences of early experiences for their adult behaviour.

It was Megan Kenyon, Jerry's secretary at the Department, who made possible a brief interview with him. A few weeks later he phoned me at Sussex to offer the possibility of joining his group as a Ph.D. student. I have often said that joining Bruner's group had a profound effect both in my intellectual and my personal life.

Translated by J. Churcher (*Note by the Author*: In this instance, 'translation' includes a generous conversation and exchange of ideas which has clarified my own thinking. This conversation began when we both were part of Jerry's team in Oxford, and it has continued without interruption these more than 40 years. *JL*).

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The Friday seminar was a unique experience. With an excellent coffee, quite unusual in England in those years, and some of the best cakes in Oxford, the seminars provided wonderful intellectual food, and weekly opportunities to interact, debate, and develop long-term friendships among the participants. For decades since then, in many different places, I have enjoyed with Jerry such a combination of good food, friendly lunches and dinners, with deep-going debate and questioning of all sorts of topics.

Throughout those years we could also see how, by the benefit of exercise with his bicycle, playing tennis and squash, and most of all, sailing, he was making a reality of the principle "*mens sana in corpore sano*".

During his visits to Madrid he enjoyed staying at the Residencia de Estudiantes, where Unamuno and Cajal had worked and where artists like Lorca, Dalí and Buñuel lived and studied together during the 2nd Spanish Republic. In a small seminar for lecturers and professors from the INEF (National Institute of Physical Education and Sports) he opened the session with a question: what is the difference between an Olympic medallist in sports and a professional dancer? The question stayed in the minds of some of his audience for years afterwards.

Questions have always been more important for Jerry than answers. Whereas answers are always limited, questions retain the potential for opening up a whole new page in our knowledge.

Although some of his best known writings deal with experimental studies of perception, thinking, learning, language acquisition and early skills, Jerome Bruner's interest in other disciplines such as education, has been a constant throughout his long life. This interest has been manifest in various ways, from his annual visits over several decades to the School of Reggio Emilia in Italy, to his theoretical writings such as *The Culture of Education* (1997).

For more than 60 years he made important and internationally recognised contributions to psychology and education. He was a pioneer of the so-called 'cognitive revolution', which has radically changed the landscape of contemporary psychology. In the field of education he has consistently supported reform of the education system and interdisciplinary study of the school curriculum.

Bruner's career has not followed a typical trajectory: against the prevailing tendency towards ever- increasing specialization, he has always looked for new relationships between the various social sciences and aspired to an increasingly global and comprehensive vision. His way of addressing problems can be seen as a double spiral, deepening them by taking them apart and simultaneously linking them with broader questions and issues. For example, at a recent conference in Lisbon of the ISPA (2013), he revisited the cognitive revolution to try to understand it, not simply as an evolution internal to psychology, but as a response by that discipline to profound changes taking place in the world in the mid-twentieth century. It is not difficult to trace in his work the beginnings of themes which would be developed and addressed in depth only many years later. Conversely, his writings continually return to topics previously studied, sometimes decades earlier, to review them in the light of more recent issues.

But any reflection on Bruner's career must begin by pointing out that he himself has turned it into a new intellectual adventure that looks back upon, and tries to make sense of, the sequence of events in his life. His autobiography, *In Search of Mind* (1983a), became the starting point for a new chapter in his research. Narrating his own life, which he tells with the energy of someone speaking to a therapist, he tries to make sense of, to explain and make explicit the nature of autobiographical narrative.

In the preface to this autobiography, Albert Rees says that the objective of the series of publications by the AP Sloan Foundation in which it appears is to enhance public understanding of the *activity* of scientists, as distinct from the data, concepts and theories that science consists in and which have become rather inaccessible to the general public following its massive expansion, especially in the last century:

> It [the scientific enterprise] is, after all, an enterprise conducted by men and women who might be our neighbours, going to and from their workplaces day by day, stimulated by hopes and purposes that are common to all of us, rewarded as most of us are by occasional successes and distressed by occasional setbacks. It is an enterprise with its own rules and customs, but an understanding of that enterprise is accessible to any of us, for it is quintessentially human. (p. xi)

It may be premature to try to evaluate from a historical perspective Bruner's many contributions to various fields of psychology and education. Often, those who have read and enjoyed his writings in one of these fields have been unaware of his contributions to others. Among educators, for example, his works of the 1960s are well known, such as *The Process of Education* (1960), *Toward a Theory of Instruction* (1966) or *The Relevance of Education* (1971). But many such readers have been unaware that equally important, if not more so, are his contributions to the understanding of human development, some of which were collected in *Studies in Cognitive Growth* (1966); of the specific contexts in which development occurs, addressed in *Under Five in Britain* (1980); or his reformulations, with profound theoretical implications, of such complex processes as the acquisition of motor skills in *Beyond the Information Given* (1973), or of language-acquisition, in *Child's Talk* (1983b).

Among his more recent works are *Acts of Meaning* (1990), *The Culture of Education* (1996) and (with Anthony G. Amsterdam) *Minding the Law* (2000). All three of these books have had a significant influence in their respective fields of psychology, education and law. At the same time, each of them requires us to broaden the perspective from which we try to understand the specific content of each of these disciplines.

Bruner's scientific career has been surprising both for its length and intensity. Born in 1915 in New York he returned there as a professor of psychology and law at the University of New York, after a long period away, first in Harvard and then in Oxford.

Initially a student of psychology at the University of North Carolina, he gained his doctorate, at the age of 26, at Harvard. Among his teachers were Tolman, MacDougall, Lashley, Boring, Allport and Krech. He himself then taught

alongside Skinner, Postman, Stevens, Solomon, White, Brown, Kagan et al., and he maintained longstanding connections with other major psychologists worldwide, including Piaget, Inhelder, Luria, Bartlett, Wason, Broadbent, Gregory, Pribram et al. But the extent and intensity of his research and teaching experience are best seen in the wide range of those who have made the various generations of students and collaborators, including: H. Tajfel, D. Slobin, E. Rosch, J. Anglin, J. Goodnow, P. Greenfield, C. Trevarthen, D. Kahneman, A. Tversky, T. Bower, W. Levelt, A. Macfarlane, P. Harris, J. Churcher, A. Meltzoff, M. Scaife, C. Davies, K. Sylva, A. Leslie, S. Sugarman, C. Pratt, A. Garton, S. Heywood, A. Whiten, A. Gopnick, … and so many others!

In 1945 he was appointed professor at Harvard University where he remained until 1972, when he accepted the Watts Professorship of Psychology at the University of Oxford. These were very fruitful years and some of its initiatives such as the Center for Cognitive Studies created with George Miller, became important points of reference for the new cognitive psychology that was then getting under way.

The contradictions of American society, and especially the consequences of the intervention in Vietnam, generated student protest movements whose effects were felt even in such elite institutions as Harvard University. The conflicts, and the need to take a position on them, affected university teachers as well as their students. It was against a background of such tensions between conservatives and reformists that Bruner was invited to accept the professorship at Oxford. Between 1972 and 1979 he was Watts Professor in the Department of Experimental Psychology there.

The years in England were very productive, as reflected in some of his books and articles on language acquisition and on preschool education. However, many of the fruits of that period were to take years to mature, including in the research and work of those who were then his students. A constant feature of Bruner's academic life has been his organizing spaces for debate, and in-depth exchange of ideas. He has always needed to created such environments for the lively exchange of ideas in order to develop his own. In reality we all need to do something similar, but he has always made explicit the need for it and he has theoretically elaborated the consequences of this exchange in the construction of knowledge.

These discussions did not consist entirely of warm collaboration and appreciation. In Oxford, for example, there were also some bitter debates and controversies. In the Department of Experimental Psychology, a series of weekly seminars was organised which became a forum for vigorous and sometimes aggressive reaction to the critique that Bruner had formulated of the fragmented image of the human being underlying many psychological experiments.

Genuinely new ideas, the putting forward of profound changes in our ways of thinking, does not take place without a simultaneous critique of existing ideas, of established theory. The intellectual ruptures involved in such changes often come to affect personal relationships among scientists, and the dispute between behaviourism and cognitive psychology offers an example of this. An exchange of letters in 1977 between Skinner and Bruner in the *Times Literary Supplement*, about

the image of human beings embodied in their two psychological approaches, illustrated the fine line between intellectual dissent and personal attacks.

His description of the Department of Experimental Psychology at Oxford as "less than the sum of its parts" (1983, p. 264) illustrates very clearly the perception that Bruner came to have the intellectual environment of the institution in those years. Because, if there are educators and educational environments that stimulate and develop those who belong to them, there are also others that limit and paralyse them. As important as finding the first is trying to escape the second.

Perhaps feeling that he was closing a chapter of his life, Bruner returned to the United States and devoted time and energy to the intellectual adventure that became his autobiography.

Between 1981 and 1987 he was Professor at the New School for Social Research, historically an institution of great importance for intellectuals who had fled from Nazi totalitarianism in the 1930s and 1940s. From the mid-1980s he was professor at the University of New York, having been Director of the Institute of Humanities, a member of the Department of Psychology and, finally, Professor in the Faculty of Law, from which he retired only in 2013.

He is undoubtedly an 'academic' psychologist. Many of his publications deal with empirical studies and experimental research in laboratories. Since his appointment as professor at Harvard, in 1945, universities have been his *milieu*. As a guest of centres such as the Institute for Advanced Study in Princeton, the Department of Psychology at Cambridge, the Centre for Epistemology of Geneva or the Max-Planck Institute in Nijmegen, his career as a researcher has alternated with his role as teacher at three major universities: Harvard, Oxford, and New York.

His scientific production in Harvard, between 1945 and 1970, established his reputation as one of the greatest American psychologists of this century and certainly one of those who have contributed most to our understanding of human development. In his research on perception, thought processes of representation, development of motor skills, cultural studies, etc., he entered into the debate and the use of ideas and concepts by other researchers such as Piaget, Luria and Vygotsky, which had previously been little known in American psychology, dominated deeply as it was by behaviourism.

The Center for Cognitive Studies, which he founded and directed with George Miller at Harvard, had an enormous impact in many different fields of psychology and became a forum for some of the most innovative ideas of psychology for a decade. Through their individual contributions and the cooperation that established the Center, Miller and Bruner came to be regarded as founders of the new cognitive approach in psychology. It is paradoxical that the Department of Psychology at Harvard University does not even allude to it in the brochure that summarizes its brief history, but this lack of recognition by his fellow psychologists has not prevented Harvard from recognizing his contribution of knowledge in awarding him an honorary doctorate in 1997.

During his stay of almost a decade at the University of Oxford he contributed decisively to modifying our ideas about the abilities of young children, about the

role that adults play in their development, and the complex relations between education, culture and society. He didn't avoid tackling complex and difficult questions, although he was fully aware of the impossibility of addressing them from the reductionism and fragmentation imposed by the traditions of the 'experimentalist' Department at Oxford.

The last two decades in New York have given us a Bruner who is once again indicating new lines of enquiry and taking up old problems from new perspectives. His ideas about narrative thinking have allowed a reinterpretation and deepening of the analysis of language acquisition as a paradigm of human education. He has moved in the direction of social anthropology in providing schools with a wider frame of reference and interpretation than is exemplified by the work of the early 1960s. A more complex and multidisciplinary notion of culture is linked with new aims in the study of psychology. The laboratory has to become a means of understanding human life going on outside it, not vice versa. Nor should school be an end in itself, since the knowledge that children need to acquire has as its horizon the external world for which, theoretically, they are being prepared.

Finally, in describing this New Yorker chapter of his life, I want to emphasize the efforts he has made to rework his ideas on narrative thought, culture, and psychology and to tackle a new area in his intellectual career: the problem of law and its interpretation.

Bruner's 'Theory', and Theories on Development and Education

It is not clear that Bruner's thought can be regarded as a theory. In some ways it is the opposite of a system such as may be found in the work of authors such as Piaget. Such systematicity derives, in part, from fidelity to key ideas that select certain facts for study in order to return immediately to these ideas in order to develop the theory further. Bruner does almost the opposite, always ready to leave familiar ground, sometimes temporarily suspending his own view, in order to venture into the unknown. He distrusts the earplugs imposed by grand systematic theories. His advice to any psychologist starting out in the discipline is a reflection of his own intellectual path: 'follow your nose'. In this way he reclaims the value of intuition in the service of patient and systematic research. Indeed, this is the quality that one most admires in both scientists and artists. His frequent trips to other universities and laboratories, his ability to accommodate very different frames of reference, to adopt them as his own and reach the point of being able to contribute to them in an original way, is in contrast with the loyalty shown by many of the great theoreticians to their own projects. For example, compared to Bruner's peregrinations, Piaget opted for the stability and continuity of his department in Geneva and of the Institute for Genetic Epistemology over many decades.

Bruner's work covers many different areas and extends over half a century. Obviously, underlying this diversity is a particular conception of the nature of

childhood, development and education, which is original and whose fertility can be gauged by the enormous amount of research that it has stimulated. But it is more an implicit than an explicit theory, aimed at discovering new fields rather than developing what is already known. And it is, above all, a theory that continues to be elaborated at different levels and whose most ambitious and general formulations are those of the last two decades.

Compared to other theories of development, such as those of Piaget and Vygotsky, we see that its objective is to develop a broader understanding of complex processes which starts from them, rather than as an alternative to them. Therefore, one of the problems that arise in trying to characterise this Brunerian theory is the one outlined in the final paragraph of the Preface to *Studies in Cognitive Growth* (1966):

> Many points of disagreement are nevertheless minor by comparison with the points of fundamental agreement we share with professor Jean Piaget. This volume would have been impossible without his monumental work. His genius has founded modern developmental psychology. (p. xv)

But if there are many similarities with Piaget, greater still is his intellectual debt to Vygotsky. The result is an original combination of both, and a pointed critique of the conception of man as a symbol-processing *machine*. In an intellectual landscape dominated by the paradigm of information processing, and the computer as a metaphor of man, Bruner relies on other social sciences such as anthropology, and on the humanities, literature, literary criticism, etc., in order to reclaim culture as the specifically human environment, and the interpretation and construction of shared meanings as the activity that differentiates us from computers. At the same time, he explicitly recognizes how much the computer metaphor has contributed to our understanding of some features of our mental processes.

In biology, he has followed closely the work of primatologists and contributed some original ideas on the interpretation of the phylogenetic changes lie at the origin of the human species. One of the points of deep agreement between Bruner and Piaget is their common interest in establishing a certain parallelism between phylogenetic evolution and ontogenetic development. Bruner (1972), who is not a biologist, believes that human development is shaped by the evolution of human beings as a species. He sees in the immaturity of the newborn, and in the prolonged state of infancy, a feature of the human species that has been selected during evolution for its adaptive advantages. In this regard there are clear parallels with Piaget's conception of intelligence as a specially differentiated organ of adaptation to an environment that is continually expanding.

From this shared vision of development stems another important parallel: the critical role that both Bruner and Piaget attach to the activity of the subject and their common rejection of a reductionism that understands this as a merely passive reaction of the body to stimuli. However, alongside this fundamental agreement, there is a significant difference in nuance. Immaturity carries with it the ability to be educated, to learn from the experience of others, without relying exclusively for survival on that of one's own. It also implies a significant difference regarding the

notion of "evolution". The ability to learn modifies the course of evolution so that, without denying the influence of biological factors, these become secondary to the influence of cultural 'evolution'. The development of man as a species is alloplastic, not autoplastic, and we survive not only by the selection of new morphological features but also by the incorporation of tools, utensils and lifestyles. Bruner rejects the idea of evolution by random sudden changes in our hereditary mechanisms. The increase in brain size is seen more as a consequence than a cause, of a way of life that benefits from the knowledge accumulated by the previous generation. Unlike Piaget, he does not think it necessary to offer a reformulation of the biological theory of evolution. For Bruner, the changes caused by natural selection in the early stages of life, together with the progressive immaturity of primates and the neoteny derived therefrom, are sufficient to open up a psychological space in which education and cultural transmission becomes possible. In other respects, his explanation of human creativity does not differ substantially from Piaget. The action that transforms the environment allows a gradual incorporation of increasingly powerful tools that amplify the original capabilities. These same tools are then folded back into the subject to achieve a coordination of internal processes that expands its original effectiveness.

Related to the emphasis on social coordination in the course of evolution, there is another basic discrepancy between the two authors. To Bruner it does not seem that equilibration is the fundamental mechanism of development. With the importance he attaches to the capacity to be educated, he regards culture and language as the two essential factors of development. The social milieu, the other, is continually creating an imbalance in an attempt to provide 'external' information to an organism that has been selected for its ability to be 'receptive' to the other members of the species. Immaturity results in a long period of dependency and it is within this that the forces that 'drive' development are generated.

One of Bruner's proposals that has attracted considerable interest is related to different modes of representation. Observing differences between children of different ages, in different tasks, he tried to explain these in terms of the way they represent to themselves the data of the problem and their own performance. Many modern theories of development, framed in terms of information processing, have an important precursor in this work. Bruner describes three different modes (enactive, iconic and symbolic) which, while having a sequential order of appearance—in both phylogeny and ontogeny—remain at the disposal of the subject throughout his life. The age at which the most complex of these (the symbolic, including language) is acquired is the same as Piaget proposed for the emergence of the symbolic function: the second half of the second year of life.

Representations, language, logical thinking, technologies, etc., in Bruner's conception become instruments at the disposal of the subject for expanding his or her adaptability and mastery of the medium. He does not feel obliged to explain logical necessity, an issue that is central to Piaget, any more than he does the complexity of technology or of human language. He is aware that the human being always goes "beyond the information given", but he does not regard logic as a product that is in greater need of explanation than other cultural achievements.

Regarding the 'construction' of their own intellectual structures, a constructive process that he shares with Piaget, he does not share with him what he calls "a vision of the development of a lonely child." Systems of representation, which include logic, do not interest him; and language, which he is passionate about, is not acquired by individual 're-discovery', but as a response to efforts by the social environment to provide them, and to the biological traits which from the moment of birth predispose us to selectively attend to these requirements in others in order to acquire these systems of representation.

Bruner attaches great importance to language, including for the development of logical strategies which, according to him, will allow the child to solve Piagetian conservation tasks. Failure in these tasks he understands in terms of an inability to manipulate iconic representations of objects by a language that, although it has been acquired from the syntactic point of view, has yet to go a long way in its acquisition of pragmatics, in learning to use it to solve different tasks and for the exploitation of other psychological processes (e.g. coordination with more primitive modes of representation).

His emphasis on the role that culture has on child development has led him to test this notion in different cultures. His conclusion is that the universality of Piagetian operations is contingent on the influence of the schooling in which the child learns to separate symbolic from iconic functioning. This continuous process of the contextualization of knowledge is for Bruner a necessary condition for the appearance of logical thought as found in our industrialised societies.

However, between the 1960s and the 1980s, Bruner put less emphasis on the processes of representation and more on action or, to be more exact, on early social interaction and communication. His aim was to establish the importance of these interactions for later linguistic and non-linguistic development.

One could say that his studies of language acquisition are having a similar impact now to that which was made earlier by his work in perception, concept formation, cognitive development in other cultures, early skills acquisition, etc. Notions such as formats, scaffolding, or the language acquisition support system (LASS), are proving useful in explaining data but, above all, they are proving extremely effective in promoting further research.

That is probably the role that best defines his 'implicit theory': to be a continuous facilitator of debates and reorientations about how to address the problems. And we hope that he will continue to do so for many more years. As he wrote recently:

> I want psychology to enter the world more fully, as Malinowski did nearly a century ago, in his brilliant Crime and Custom in Savage Society. I think such cultural inquiry (which is growing) is essential for cultivating and maintaining psychology's breadth and scope. They make us forever aware of the constraints and the opportunities that characterize the human condition. (Bruner 2012, p. 12)

Moises Esteban, in the present volume, shows how Jerry's later work on cultural psychology and narrative thinking is having a strong and increasing influence in Spanish Psychology.

I would like to finish with Jerry's own words about two central concepts in all our conversations for more than forty years.

> We are learning much about how our species reinvents itself to cope both with the constraints of our biological nature and with the opportunities of the cultural worlds that we create. And this has real implications for education.
>
> Education is not and should not be devoted exclusively to the transmission of established knowledge. It should also dedicate itself to cultivating awareness of the human condition and to generating skill in understanding the nature and sources of knowledge. That is to say, education is not only about mastering content, but also about gaining insight into the nature of knowing and understanding. Yes, I am saying that we should cultivate an appropriate epistemological sensitivity in our school children, an awareness concerning the processes involved in learning and thinking and not just in the finished products that we call a curriculum. It is absurd to say that children are not capable of understanding such matters. Their spontaneous play activities are full of explorations of the possible, of what might be and why it sometimes is and sometimes isn't. I strongly urge that we cultivate that sense of the possible in our educational practices". (Bruner 2012, p. 12)

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Meetings with Jerry Bruner

Juan Delval

Starting a conversation with Jerome Bruner, who likes to be called Jerry, is always starting to discover news aspects of things. Because Jerry loves to talk about a vast variety of topics, and usually has his own opinions about them. Either if it's about the discovery of America, the travels of Columbus, the evolution of the Latin American countries, the black paintings of Goya, the modern architectures, the impressionist painters, the Italian literature of the 20th century, the Spanish crisis after the Cuban war, or any topic that we can imagine about culture, history or literature, he likes them with all with passion. Because Jerry is a tireless conversationalist, he likes to be able to express his opinions about different things. When he initiate a conversation topic, he begins to connect it with other topics, and sometimes he asks for information about things he doesn't know much, but manages to connect them to things he's more familiar with.

He likes to chat with his friends while drinking a glass of whisky and smoking a cigar before or during dinners. And when we introduce him to a new friend who has a profession very far from his own, he can always finds connection points and the opportunity to express his opinions and shows his great culture in most various environments. In reality, he likes most to chat about topics other than psychology and education, in which he has realized the most important input.

I was lucky to meet Jerry in the summer of 1976 in Oxford, when I was a resident of Wolfson College, through my good friend José Linaza, who was a student of mine in the 1969 to 1970 class in the Complutense University of Madrid. José went to England to work on rats learning at Sussex University in Brighton. However he soon found the limitations of those works and decided to move to Oxford and work with Bruner, who finally tutored his thesis about aspects

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of infant games. Bruner published a book about Play in that year in which he expressed his opinions, as original as always, about this infant activity. In that book he also collected a series of very important texts about the study of play through its historical development. However, that was only one of the things he was interested in, because along his extensive career he has contributed to an infinite number of topics and always from original and unique perspectives.

In Oxford it was frequent to mention Jerry's energy in academic and social activities, specially his love for sailing with the boat he had crossed the Atlantic from United States to Ireland.

Among his contributions we must mention his studies of perception and its social influences, or his work on concept formation, the studies he presented in Moscow as a tribute to Piaget's 70th birthday, or his research on play, on infant language, on narrative thinking and biographies, on narrative thinking and Law, etc., Bruner has approached different topics, some of them have been extensively studied before, but he always added to them his personal vision, which has opened new fields in all of them.

The important role he has played in education is well known, above all since the crisis produced in USA after the launch of Sputnik by the soviets in 1957 that led him to the development of educational programs and to write his book *The process of education*, one of his most spread works.

I came to be in contact with Bruner and his collaborators work when I arrived at Geneva in 1965. In the next year, Bruner published a book, together with Olver and Greenfield, in which he analyzed different Piagetian problems and intended to propose alternative explanations. I had the impression that the book was received with certain suspiciousness in Geneva, because although it recognized the importance of Piaget's work, it also, in some way, criticized it and proposed alternative explanations. I was suspected that the relations between Piaget and Bruner always was a bit complicated, and probably part of the reason was Bärbel Inhelder, who had gotten an excellent relation with Bruner, and even got proposed by Bruner to teach in USA, things that Piaget didn't agree. She stayed in Geneva in the end for this reason.

Bruner visited us in numerous occasions in Spain, especially in the Autonomous University of Madrid. In 1986, he was awarded honorary doctor of this university and José Linaza wrote his Laudatio for the ceremony. Afterwards he has been professor in the Ph.D. Program in our department of evolutionary psychology and education for several years. And he has become a friend with whom we had occasions to share many moments. He had dinner in my home many times with numerous friends and always had long conversations with all of them. I remember his talk with my daughter Irene, who told him about her interests in studying the primates. Jerry gave her professional advices and encouraged her in this interest.

Jerry is an extraordinarily coquette person, and he always likes women very much, especially the young, intelligent and beautiful ones. He loves to talk and flirt with them and never lost that coquetry. When he began to have mobility problems, he uses baton to walk and doesn't like our intention to help him, for example to climb steps, and has always maintained a great independency.

Another trait that identifies him is his inexhaustible sense of humor. Very often he feels tired and bored of those formal acts in which he is obliged to attend as a very important and recognized person, with authorities, rectors, mayors, and headmasters, etc. When we were with him at the ceremony of his doctor honoris causa at the University of Girona, a few years ago, once the formal act was over, I remember he took off his tie and put it on his head as a crown and then proposed that we go to drink a cup of brandy to be free of all the formalities.

Knowing Jerry Bruner, one of the greatest figure of psychology and education of the 20th century, has been a great luck, to which I have to thank my dear friend José Linaza. I am lucky not only because I have been in contact with a great scientist, but also because I have been able to appreciate his personal and humane values, which are equally extraordinary.

Bruner's Narrative Turn: The Impact of Cultural Psychology in Catalonia

Moisès Esteban-Guitart

My first meeting with Jerry Bruner came about due to the generous friendship of José Luis Linaza and my colleagues and friends of the University of Girona (Josep Maria Nadal, Ignasi Vila, Ramon Canals, Pilar Monreal) and dates back to June 2005 during one of his many trips to Spain, and in particular his visits to Girona and the Costa Brava. I was, at that time, engrossed in a subject that has intrigued me ever since: the question of human identity (Esteban-Guitart 2012a, 2016; Esteban-Guitart et al. 2007, 2008, 2010). I was tackling the issue having recently completed my degrees in psychology and philosophy and having begun my Master's degree and PhD Program in Educational Psychology, in an interuniversity program coordinated by César Coll of the *Universitat de Barcelona*. I could never have foreseen that ten years later, after the retirement of Ignasi Vila, I would find myself responsible for the same doctoral program at the University of Girona, under the continuing general coordination of César Coll at the University of Barcelona.

In any case, the fundamental question I was asking myself at that time was: 'What are the psychosocial mechanisms involved in the construction of human identity?' Of course I continue to ask this question, a number of years later, dogged by the frustration that comes with finding more uncertainties than answers. However, one mechanism that seemed to me, and still does, to be sensible and especially important is the cultural and narrative nature and contingency of human identities, and consequently, their artefacts: conventionality and arbitrariness. This is what I learned from my readings and conversations with Jerry. It is also an argument in favour of cultural psychology. In an interview I had with him, which was to be published later that same year, Bruner said:

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> Identity is situational and is distributed among all those groups, institutions and individuals that make up the texture of our lives. In constructing the feeling of being ourselves, of who we are, we use narrative that has a component of fiction, of storytelling. We go along building and evoking fictitious identities that enable us to give meaning and coherence to our lives, to cope with what happens to us and to explain things that break the canonical or established models (Bruner 2005, p. 14).

From this perspective, identity appears inextricably linked to one's biography, in particular it is an autobiography, a *life story* that is made and unmade, using the *narrative mode of thought* (Bruner 1987), in order to confer sense, to give some purpose and coherence to our lives and an explanation of ourselves within them (Esteban-Guitart 2012a).

In other words, human identities, along with cultural practices, are resolved as acts of creating stories whose purpose is to make sense of the world and what is in it. Not only do these stories help us to understand and manage our world, but they also take shape in those prescriptive institutions, such as marriage or organized religion, that lay down rules governing human behaviour: they ease our uncertainty and warn us about what is to be expected and how we should behave (Bruner 2003). Hence, as Bruner went on to say in the same interview, identity begins as a problem, or rather a *need*, to seek out and ensure certain securities and relationships that can inform us about who we are and how we should behave.

However, this is far from being a solo voyage: invariably, we recognize ourselves through others. And at this point in the conversation, we remembered the book of Ricoeur, *Soi-même comme un autre* [Oneself as Another], and Bruner reminded me of the legacy of Durkheim when he said that in the formation of collective identities there is an imaginary process—a narrative—the objectification of subjectivity. It is a process that, in some cases, can become a murderous instrument in the form of rejection, prejudice and racism towards others—a line of investigation developed by Bruner's great friend, Henri Tajfel (1919–1982), with his theory of social identity.

I have always thought that the extraordinary film, *Big Fish*, directed by Tim Burton and based on the novel by Daniel Wallace, is a magnificent literary and cinematic illustration of Bruner's concept regarding the crafting of identity as narrative creation. On one occasion, to the bewilderment of my students, I decided to show the film in the context of a course on *Development and Culture*. At the end of the film, after uncovering the truth behind his father's life stories, the protagonist sums it all up very neatly: "That was my father's final joke, I guess. A man tells his stories so many times that he becomes the stories. They live on after him. And in that way he becomes immortal"

A few years earlier, in June 1997, Jerome Bruner was welcomed into our academic community as *Doctor Honoris Causa*, having been proposed by the Faculty of Educational Sciences (now the Faculty of Psychology and Education) on the initiative of the psychology department. The rector of the still fledgling University of Girona at that time was Josep Maria Nadal, who was my PhD supervisor along with Ignasi Vila. The declaration of the University's Governing Board (session 7/96; 28 November, 1996) stated "we hereby agree the appointment of Mr. Jerome

S. Bruner as *Doctor Honoris Causa* of the University of Girona, for his capital contribution to the study of the issues involved in the educational process, for his considerable influence in the psychological community and for his teaching at this university."

His acceptance speech, a marvellous text in my opinion, although not widely known, was entitled "Fundamentals of Human Care-giving: The Early Beginnings". This is a brilliant that address not about the problem of identity, but to me about its genesis and psychosocial origin. It is, in fact, an articulate dissertation on the origin and genesis of our culture characterized by the extension and manipulation of our biological and psychological faculties through the use of our *culture's toolkit* of *prosthetic devices* (Bruner 1996, p. 168): these days it is the *Whatsapp* that helps us to broaden our means of communication, the monuments as institutionalized systems of collective memory or the school as the 'decontextualized context' in which we can present whatever we want to through the use of re-presentation, storytelling and narrative imagery that evokes *possible worlds* (Bruner 1987).

These psychosocial foundations of culture, which recently Tomasello (2014), under the influence of Bruner (Lazarus and Esteban-Guitart 2014), brilliantly described as *shared intentionality*, were described at that acceptance speech as follows:

> Let me conclude this part of our discussion by noting only that the presence of human intersubjectivity and the gifts that it brings – like symbolic 'standing for' – allows us to use others as guides in adapting to the world and, indeed, to operate jointly with others in constructing, a world to which we are able to adapt. I also want to argue that such intersubjectivity is a condition for language and its use, that it is the heart of the "standing for" relation without which there could be no symbolic language. Without these things, the cultural adaptation would be impossible (Bruner 1997, p. 88).

Intersubjectivity appears to Bruner as that capacity that allows us to *connect our minds*, to share the experience and attention and to assume the presence of subjective states in other people: not only taking into consideration their actions but, above all, their intentions (when the one-year-old child imitates what others do but also what they are trying to do—reproducing the intentionality of others, rather than their performance). This capability, uniquely human despite its phylogenetic roots (Tomasello 2014), is the building block not only of any educational action but of any cultural enterprise that requires a pooling of common knowledge (tacit, implicit agreement, which is institutionalized and canonized).

> But there is more to the "meeting of minds" than intersubjectivity, symbolic standing for, felicity conditions, and the rest. What is needed as well is an interpretive community joined by common "background knowledge". Such an interpretive community (beginning, say, with the immediate family group) soon becomes "institutionalized" and subject to traditional standards (Bruner 1997, p. 88).

And of course, *intersubjectivity* is an indispensable requirement for the acquisition and development of language: the most important psychological and cultural artefact, also probably the most arbitrary and conventional, at least in the sense of that language that makes possible the special, most-specifically human forms of thought and social organization (Vygotsky 1978).

> Don't let "brain claims" blind you to the fact that acquiring and using a language is a cultural achievement of a dazzling order, the more amazing for the fact that it is occurring all over our planet millions of times a day. It is a process that is so interestingly varied in pattern from place to place as to constitute one of the deepest mysteries of the human condition (Bruner 1997, p. 81).

Some Brief Notes on the Influence of Bruner's Narrative and Cultural Psychology in Catalonia

In the aforementioned speech accepting his honorary degree, Bruner synthesized some of the now well-known issues that have had the widest international impact but have also had a great influence in Catalonia in particular, with works on subjects such as non-verbal communication (Perinat 1986) and the issues involved in the acquisition and development of language (Vila 1983). Bruner's 1983 book *Child's Talk. Learning to Use Language* was translated and published two years later in Catalan by EUMO (Bruner 1985) and Ignasi Vila's studies on language acquisition and development are a good example of the influence of Bruner's classical notions, such as the idea of *joint action and attention*, among others (Vila 1983; Vila and Múñoz 1985; Vila et al 1987).

However, the influence and impact of Bruner in Catalunya is not limited to the analysis of the issues involved in the narrative construction of human identity, or to the study of language acquisition and development; one of the topics that has long concerned Bruner is education (Bruner 2006). It should be noted that, for Bruner, what characterizes our species is not our intelligence or reasoning, as Descartes or Piaget argued, but our ability to educate and be educated. Our species can be characterized primarily as *Homo Educandus* rather than *Homo intellectualis* or *Homo sapiens* (Esteban-Guitart 2012b).

In this regard, in 1992 César Coll and his colleagues were carrying out a research program on what they called *mechanisms of educational influence* (Coll et al. 1992). They analysed two such mechanisms by investigating how joint action was being organized in relation to the content or task through the teacher/student group interaction (interactivity). They themselves were influenced by Bruner's now famous metaphor of *scaffolding* (Wood et al. 1976) and the notion of *intersubjectivity*. The two mechanisms were (a) the assignment and progressive transfer of control and of responsibility for the task, and (b) the progressive construction of systems of shared meanings (Coll 1997; Coll et al 1992). This was a fruitful line of research that has allowed them, among other things, to identify discursive strategies that facilitate and promote school learning through educational dialogue or negotiation of meaning between the classmates or between teacher and students, as well as methodological advances in the microgenetic analysis of teaching sequences and the organization of activities in educational contexts, whether formal or informal (Coll et al. 2008).

Another highly significant educational outcome of Bruner's thoughts and ideas for schools in Catalonia—in this case, *La Amistat* school in Figueres

(http://www.escolaamistat.org/)—is the creation of learning communities or *sub-communities of mutual learners* in which participants help each other and learn from each other through the negotiation of meaning (Bruner 1996). In this case known as *interactive groups*, and following Bruner's thesis, the classroom is organized into small heterogenic groups of between 4 and 6 members which include members of the children's families and the educational community. The dynamics of this activity consist of rotating the groups of pupils among the different learning activities encouraged by an adult; each activity lasts 20 min. The role of the adult is to promote the communicative interactions thereby ensuring the joint creation of knowledge through dialogue, (Elboj and Niemelä 2010).

One way or another, educational reform has always been present throughout the life and work of Bruner, or at the very least since his time at Harvard and following the publication of his book, *Process of Education* in 1961 (Esteban-Guitart 2009). And, indeed, it seems such reform is needed now more than ever given the social, cultural, and economic context we find ourselves in today (González-Patiño and Esteban-Guitart 2014; Subero et al. 2015).

Over 100 Years of Life

I began by recalling my first personal contact with Bruner and I would like to finish with another wonderful, more recent personal memory, involving some of the same people. On the initiative of the *Fundación Liceo Europeo de Madrid*, I was fortunate to share in a public discussion with Bruner, accompanied by his friend and host, José Luis Linaza, among other colleagues. It was again in June but this time barely three years ago, in 2012. I had the extraordinary luck, once again, to be able to converse with him and learn more not only of his long career but his life and experiences, now much more connected to aspects of the Law but, as always, difficult to circumscribe and reduce to one field of study or one area of knowledge. Jerry has always been interested in what is *human*, and the subject is far too important to be left solely in the hands of psychology, law, education or literature. However, building bridges across academic borders is not always easy and can often lead the less capable astray. This is not the case with Jerry Bruner. He is and will remain a renaissance man blessed with a tremendous sensibility towards culture and social justice. It is an intensely emotional experience and one that gives me great pride to be able to contribute to this collective account of life stories criss-crossing with his.

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Motor Skills, Motor Competence and Children: Bruner's Ideas in the Era of Embodiment Cognition and Action

Luis Miguel Ruiz and José Luis Linaza

Introduction

The twentieth century was rich in prominent psychologists and one of them is Jerome Bruner. His extensive academic and scientific career has allowed him to provide light and knowledge in different fields of study, from psychology to law (Bruner 1957, 1964, 1965, 1966, 1970, 1973a, b, 1974, 1986, 1988, 2001, 2004, 2006, 2013, Bruner and Bruner 1968; Bruner and Koslowski 1972; Bruner and Haste 1990). His thoughts have stimulated numerous scholars to continue the process of knowledge construction and to adopt the maxim, as Bruner (1966) did, that the whole human being was the subject to study.

His long life's work permitted him to meet and collaborate with the greatest of his time in fields very different of study. It was in the late 60s and the 70s when he decided to engage in research about with babies. In his Autobiography (1980, 1983) he recognised that it wasn't clear what he wanted to do in studying babies at the Centre for Cognitive Studies in Harvard University. It is obvious that his own research, and the large number of studies carried there by different groups of the Centre or visitors, contributed to change the image of babies as much more

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competent and active human beings. But he never suspected his research on babies could have such a large impact within psychology and outside the discipline.

As Gibson acknowledges (1988, p. 3) a few psychologists were writing about action in the 1970s, but Jerome Bruner devoted a series of papers to the topic and made the development of skilled action in infancy the subject of a number of studies. Many of his ideas and proposals to study children's motor skills have become crucial references to explain motor development of children (Beek 1986; Bertenthal 1996, Corbetta 1999; Hopkins 1986, Gibson 1988, Jones 1982; Kerr 1982; Griffin and Keogh 1982; Keogh and Sudgen 1985; Newell and Barclay 1982; Newell 1986; Rarick 1982; Smoll 1982; Thelen 1995; Wall 1986). As Hogan and Hogan (1975, p.233) wrote the nature of motor skill development that Bruner and his colleagues (e.g. Connolly 1977) proposed in their research have succeeded to be recognized as scientific approach in spite of its departure from the dominant behaviouristic approach in sports and physical education research.

His participation in the Study Group on *Mechanism of Motor Skill Development* in 1968, the Study Group on *The Growth of Competence* in 1972, and in many other different scientific events related to children's abilities and competences, suppose a turning point in the recognition of these human skills, and the encourage to participate of some of the most renowned researchers of the time (e.g. Twitchell, White, or Connolly) in the same effort: to incorporate the study of development of children's motor competence, as part of his interest about the origins of human behaviour.

His research about manual skills and the visual behaviour of infants, the notion of competence, and his proposed of enactive representation were very new and advanced for the time. This influence has not always been recognized in the sports and physical education disciplines in Spain though a few texts have highlighted his contributions to the study of infant's action development (Deleau 1987; Linaza 1984a, b; Linaza and Maldonado 1987; Ruiz 1987, 1995; Ruiz et al. 2001). This recognition is more frequent among Spanish developmental psychologists. We could say that Bruner is recognized more for his contributions to cognitive development or the study of language, than for his research on infant motor control.

Children's vision and action played a prominent role in his understanding of children's development (Kalnins and Bruner 1973). Bruner had an embodied conception of development expressed in his conception of competence. It seems as if they considered the concept of competence as a less scientific concept and more an educational and social one (Connolly and Bruner 1974). But when they talked about competence they were talking about intelligence in the broadest sense, operative intelligence, knowing how rather than simply knowing that (p. 3). And competence implies actions and an action implies a body. When Bruner studied children's actions, he went beyond the mere interpretation of cognitive development, he discussed how human beings facing the need to adjust to the environment and be competent in it.

As Gibson (1988) wrote Bruner's emphasis on function or action, gave a new character to the study of even such apparently simple exploratory behaviours as reaching for things (p 4). This interest exists at the present time in embodied researchers as Thelen (1984, 1992, 1995) (see Ruiz 2013), Iverson (2010) or Iverson and Thelen (1999). Reaching or locomotion are not only exploratory

activities, they are ways of being in the world. Motor competence changes infants' experiences with objects, people, and their own bodies in ways that are relevant for understanding infant's development. Motor actions are not irrelevant; mind arises from having a body that interacts with the environment. Bruner considered that cognition depended on having a body with particular perceptual and motor capabilities and the kind of experiences that such a body affords. In other words, cognition is a product of the body and the ways in which it moves through and interacts with the world. As he wrote (Bruner 1965, p. 1007).

> What is most unique about man is that his growth as an individual depends upon the history of his species-not upon a history reflected in genes or chromosomes but, rather, reflected in a culture external to man's tissue and wider in scope that is embodied in any one man's competency (1965, p. 1007).

Bruner (1973a) considered that the study of children's skills should not be just a chapter in developmental psychology but a key issue for understanding the evolution of humans as a species embedded in his context of action.

Actions, Motor Skills and Embodied Competences

There are different approaches to skilled action in present time. All of them have been called embodied approaches (Wilson 2002). Rowlands (2010) considers that post-cognitive psychology is characterized by four *Es*. Enacted, Embedded, Embodied and Extended. Current approaches have returned to the body and motor skills relevance to understand our way of thinking, learning and communicating (Gallagher 2011; Varela et al. 1992). In the 1970s very few psychologists wrote about childhood skills. Bruner wrote several articles (Bruner 1970, 1973a, 1974; Bruner and Bruner 1968) to explore the organization of children's skills. The emphasis of Bruner in function, and the actions involved in these functions, was instrumental in his research, as he has often recognized. His theoretical orientation has been markedly functionalist in the tradition of James, Dewey, MacDougall, Vygotsky and Tolman (Palacios 1988).

Bruner studied the attainment of competence but a competence embedded smoothly into a large context of action (Bruner and Bruner 1968), a competence that is *Enacted, Embedded, Embodied and Extended*. For him competence implies action, changing the environment as well as adapting to the environment (Connolly and Bruner 1974). Bruner was the first psychologists to employ the concept of enaction. For him a baby/child represents his/her world through actions. His/her knowledge for motor skills (e.g. riding a bike, playing soccer or tennis) are represented in an enactive mode. This is the way that human beings are in the world, and as Beilock (2015) wrote the way a child moves expresses how his/her motor co-ordination relate with his/her mental competence. Bruner's interest in babies was concentrated on motor competence that they achieve during the first year of life. These competences were divided in six broad enterprises (Bruner 1973a, b): Feeding, perceiving or attending, manipulating the world, locomotion, interacting

with members of his/her specie and the control of the internal state. Bruner's enactive knowledge means that perception is a kind of action, a kind of skilful body activity (Noë 2004, p. 2). He highlighted three main themes in the development of this knowledge and the attainment of competence: Intention, feedback and action schemes that mediated between the two (Bruner 1973a, b; Gibson 1988).

When Bruner describes child's actions (grasping or reaching) they show a child embedded in his context of action. He gives emphasis to his intention, to Bernstein's wished future, and it constitutes a core concept in his model.

> It is possible to argue at length about the origin of intention in early infancy, and such arguments may indeed be fruitful in stimulating research. Intention viewed behaviourally has several measurable features: anticipation of the outcome of an act, selection among appropriate means for achievement of an end state, sustained direction of behaviour during deployment of means, and finally some form of substitution rule whereby alternative means can be deployed for correction of deviation or to fit idiosyncratic conditions (Bruner 1973a, b, p. 2).

Bruner leaned to Bernstein (1967) and Vygotsky (1966) to explain how the child programmed his/her actions, how the environment influences these actions and how he/she transforms into a problem solver. He accepts the idea no deterministic of child development, and the corporeal nature of mankind. With Vygotsky he assumes the idea of Spinoza that "no one has yet determined of what the body is capable". Child is a thinking body in the words of Ilienko, a soviet psychologist contemporary of Vygotsky (Surmava 2010).

A thinking body that no one has yet determined. A body whose actions are in accordance with the universal forms of the world of objects (p. 42).

> At the beginning of the last century, when Vygotsky lived and worked, the nature of the human body was associated not with the Ilienkov-Spinoza idea of a thinking body but Pavlov's conception of the body as a stimulus-reaction machine… In the second half of the century, the situation began to change through the efforts of the great Russian physiologist N.A. Bernstein, but each step in this direction still required enormous courage and enormous effort. (Surmava 2010, p. 42)

Bruner shares these ideas of the Russian authors, and consider that cognition is embodied in child's motor skills, and this gave new possibilities to study motor skill development (Davids 2001; Thelen 1984, 1985, 1992). As Gibson (1988) said reaching, grasping, crawling, walking and so on are not necessarily exploratory activities, but they must be regarded as prominent in the service of exploring the world and its furnishings, is a way of extended his mind. The growth of an individual, said Bruner, depends on the history of his species which is reflected in the culture external to human tissue and wider in scope than is embodied in any of human competence, growth of mind is assisted from outside (Bruner 1965) and extends to outside. The limits of growth depend on how a culture assists the individual to use his potential. Cognitive development is embodied and emerged from the intense relationships that children establish with their environment (Thelen and Smith 1998). That is the way a child develops his motor competency.

And in this embodiment process Bruner's considers at least three elements. (1) Being able to select the features from the total environment that provide the

relevant information for elaborating a course of action. (2) Having planned a course of action, the next task is to initiate the sequence of movements to achieve the objective we have set for ourselves. And (3) using what we have learned from our success and failures in the formulation of new plans (Connolly and Bruner, p. 3). He also distinguishes five main stages, which he named: Sequencing, Modulation, Synchronization, Task analysis and Modelling. Some motor behaviourist like Robert Kerr (1982) considered this model relevant to explain motor development because its pedagogical consequences.

These stages were characterized by:

- *Sequencing*. This stage involves the reorganization of action components (subroutines) to get an objective. When action is reorganized it is to have success in their intentions, their performance is less variable and more automatic.
- *Modulation*. In this stage children's system of information processing is released from the control of the action and is ready to interact more openly with their environment, showing more calibrated performances.
- *Synchronization*. In this stage movements learned combined in sequences of more complex action synchronously, in which each component has its time and place in the action, forming what the current ecological theorists would call a co-ordination structure.
- *Task Analysis*. As the child becomes more and more competent and his experience about objects and actions increases, is able to use this knowledge in the analysis of the tasks to be performed.
- *Modelling*. The above four stages are the foundation of this stage called modelling. This stage depends on the level of competence acquired by children. This competence allows them to use more efficiently the model observed and the skills they need for imitation and mastery. When children acquire new motor patterns, they practice to control them. Once acquired, he incorporates them into more complex action sequences.

But we also know from the work of Held (1965) and of White et al. (1964) that practice is crucial in the perfection of reaching (Bruner 1973a, b, p. 3).

Bruner conceives the development of skilled action as a constructive process of serially ordered constituent acts whose performance is modified toward less variability, more anticipation, and greater economy by benefit of feed forward, feedback and knowledge of results (Bruner 1973a, b, p. 5). In different writings across the 1970s, along with Connolly (Connolly 1970, 1977, 1986; Bruner 1970, 1973a, b; Connolly and Bruner 1973), they developed a conception of the process of the acquisition of motor skills in childhood. Their theoretical positions were very critical with maturational ideas, highlighting that motor development should be explained on the base of the concept of skill and adding that these children's "skills" were made up of subroutines (Connolly and Bruner 1973). This view has encouraged to the present time the development of different models and studies on the hierarchical organization of the skills (Freudenheim and Manoel 1999; Giménez et al. 2006; Manoel and Connolly 1997; Manoel et al. 2002).

Following the tenets of Bernstein (1967), Bruner (1970) also highlights the presence of a number of components in this construction process, such as: (a) A mechanism of response (output), which should be regulated. (b) A power regulation, which defines intentional action, (c) A receptor mechanism that records the course of action, (d) A means to compare the response to the intended plan and (e) A process of correcting errors that compare the differences between the proposed plan and the action and transform in new regulatory signals.

The development of motor competence is considered, therefore, as a hierarchical organization of components or subroutines, where previously dominated modules become part of more complex skills in the course of child development. In this process, the concept of modulation is capital, being considered as a process by which a subroutine is dominated to become a unit of action, becoming more automatic, less variable and more predictable spatiotemporally, and can be combined with other units to carry out a complex motor sequence (Manoel and Connolly 1997).

Modulation of skills permits the body to regulate excess of energy in favour of an operational economy, encouraging adaptability to changing conditions and variables. This flexibility and adaptability of skills depend on their applicability to changing contexts and, as Bruner (1970) indicated, it exists in children a real boost to the change that must be preserved and cultivated. It is a process of exploratory development that he knew very well, a process enacted, moving provide children with information about his environment, his possibilities and affordances.

Exploratory motor competence of young children is critical to their future development and even predicts academic performance in adolescence (Bornstein et al. 2013). Clearfield (2011) showed how the social relations of children 9 to 11 months changed radically from crawling to walking. When children change the way of looking at the world they increased the frequency of active interactions with his social and physical environment. This idea is not new, and some authors assumed it in the field of motor development (Keogh and Sugden 1985).

The interaction with the environment causes the children to use their resources for acting strategically, improving them in terms of accuracy and economy, or building new responses to new situations. This is the generative conception of Bruner's development of motor competence. The child has a limited set of rules of action that would enable the realization of an almost unlimited number of possible answers. The Dutch sports psychologist Van Rossum (1987) considered Bruner's ideas and divided the process of child acquisition in two stages: (1) Construction phase and (2) Refining phase. Also the French sports researcher Marc Durand wrote:

> Bruner describes motor development as dominated by processes of integration of key motor components, organized hierarchically, allowing the realization of more complex tasks (subroutines), these subroutines may also be integrated into more complex courses of action to learn new motor skills (1988, p 122).

Another very interesting aspect of these studies (Bruner 1964, 1965 1970, and 2001) is his account of how children's actions are represented. For him representation is a set of rules by which their actions are preserved or represented for future use. It's the way children have to build their knowledge from action. This representation has three main forms that appear in an orderly manner. For

a representation enactive side or action, second iconic representation through images and thirdly, the symbolic representation through symbols. As we said above, it is very interesting to note that the current movement of *embodied cognition* maintains the role of motor actions in the development of the mind, and for some authors have taken up the term *enactive* to highlight it. This is, for example, the case of Varela et al. (1992) as mentioned by Avilés et al. (2014).

Concluding Remarks

The study of motor development has always had a lower status, what some call a Cinderella status (Connolly 1980; Rosenbaum 2005) as compared to other areas of development. Bruner's approach to motor skill development was genuine and well advanced for its time, returning the body and the motor skills its relevance in the study and development of child's mind. His model of skill development embedded in the contexts of action, as well as the role of adults in the development, allow us to see the children in the process of solving motor problems and, in so doing, to expands their minds to solve new motor problems.

Motor development is not considered as an epiphenomenon that takes place as a consequence of other developmental events of far greater importance, such as cognitive, emotional or language development (Pollitt and Caycho 2010. In this perspective the child is a thinking body that plays and explore his environment. And, as Bruner (1973a, b) wrote, playing has the effect of maturing some modular routines for later incorporation in more encompassing programs of action. To become competent it is necessary to exercise. And to make the exercise highly flexible, play must precede it (p. 8). As a declared environmentalist, Bruner emphasizes the role of the environment surrounding children and its instigator role in the development of skills. At the same time he considered the relationships between adults and children as a key factor. With his concept of *scaffolding* he gave a most relevant role to the adult in the development of children's skills.

Bruner's ideas of skill development were product of its time, advanced, new and provocative. Forty years later, many of these ideas are still relevant today for many researchers. Bruner's research on the development of infants and child's skills and competencies, remain a model of how to face the challenge of understanding the development of human beings.

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The Role of Immaturity in Development and Evolution: Theme and Variations

Juan C. Gómez

Nature and Uses of Immaturity

It is difficult to choose one topic to write about Bruner's influence upon psychology and related disciplines—this has been so vast, varied, and extended by his many students and the students of his students! As a member of the latter (hence my reference to Bruner as "Bruner", and not as "Jerry"), I have decided to focus upon one particular period and aspect of his work that, through the mediating influence of my supervisor and former disciple of Bruner, José Linaza, was especially significant for my own growth as a developmental and comparative psychologist—his ideas on the nature and uses of immaturity in development and evolution, and their relation to preverbal communication and interaction.

In 1972 Bruner published his paper "On the nature and uses of immaturity," based upon an Invited Address to the XXth International Congress of Psychology (Tokyo, August 1972), and several other presentations given in 1972, among them one revealingly entitled "The Primate Evolution of Educability" (April 7, 1972. Compton Lecture Series). This paper (re-published in 1974 and 1976 in book compilations) came at a particular junction in Bruner's career. He had just completed his studies on infant skill, and was ready to start studies on infant early communication and their transition into language in Oxford University (as a note in the immaturity paper warns, reprint request no longer had to be addressed to Harvard, but to the Department of Experimental Psychology in Oxford).

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In this paper Bruner addresses the biological nature of human infancy as part of a wider and older evolutionary pattern in the primate order. The premise of the paper is this:

> To understand the nature of any species fully, we need to know … how its young are brought from initial, infantile inadequacy to mature, species-typical functioning… The nature and uses of immaturity are themselves subject to evolution, and their variations are subject to natural selection, much as any morphological or behavioral variant would be…. One of the major speculations about primate evolution is that it is based on the progressive selection of a distinctive pattern of immaturity. (Bruner 1972, p. 687.)

The question is why human infants have evolved to be so dangerously, recklessly immature? How is it that in primates evolution seems to have worked towards increasing and prolonging the "infantile inadequacy" that renders young members of the species unable to survive on their own for such long periods of time? What is the point of making infants increasingly vulnerable and exposed? There must be a powerful, longer term adaptive reason for this apparently maladaptive maneuver.

Curiously enough, as explained in his autobiography (Bruner 1983), his first ever scientific paper was already related to the problem of immaturity and its potentially adaptive role in development—the physiological mechanisms that may delay growth and sexual maturity for an adaptive purpose. In "The effect of thymus extract on the sexual behaviour of the female rat" (Bruner and Cunningham 1939), he and his supervisor confirmed the idea that the thymus plays a role in the metabolism of organisms and the control of the advent of sexual maturity, a finding supporting the hypothesis that the thyme may act as "a buffer system protecting against the attainment of sexual maturity until the organism is ready" (Bruner 1983), a hypothesis that Bruner remembers as having found "interesting" because it was the first true theory of development that he had come across.

Bruner's immaturity paper 32 years later places human immaturity (a delay in behavioural and cognitive growth) in an evolutionary context. Human infants are an extreme version of a primate evolutionary pattern that forces development to take place under adult protection and intervention. Immaturity is an adaptation that sets development inevitably in a socially mediated, *educational* pathway.

The idea that the lengthening of the infancy and immaturity periods, with its inevitable effects on strengthening dependence upon parents and caregivers, may have played a major role in human evolution by promoting development through education was not new. For example, John Fiske, an American philosopher and historian interested in the popularisation of Darwinism, advocated it at the end of the XIXth century in an essay entitled "The meaning of infancy" (Fiske 1883). Fiske explains that he realised the crucial biological function of prolonged infancy after reading Alfred Russell Wallace's account of the immaturity of a baby orang-utan that revealed how comparable it was to the immaturity of human infants. Fiske proposed to "interpret this period of helplessness and dependence as one of plasticity and opportunity… the greater power of man in adjusting himself to the complex conditions of life is due to his educability…" [Fiske 1911; preface written probably by Henry Suzzallo]. He called it "the doctrine of the meaning of infancy" and

emphasised how it provided an evolutionary 'legitimacy' to the task of the educator, as the key to human distinctiveness is our evolutionarily selected educability.

In *Nature of Immaturity* Bruner seizes this theme (unclear if from any particular source, or as a speculation that was somehow 'in the air') and, to use a musical simile, performs a series of creative cross disciplinary variations playing the 'immaturity-as-adaptation' theme from a variety of perspectives—evolutionary, anthropological, developmental, cognitive, and educational— exploring ways in which we can attempt a truly interdisciplinary understanding of the implications of this essential feature of humans.

Indeed Bruner *plays* with immaturity and its implications in this paper, which not by coincidence was reprinted as the very first chapter in the magnificent compilation *Play: its role in development and evolution* (Bruner et al. 1976). This book collected a disparate, disperse interdisciplinary literature about play, object manipulation and exploration, among other phenomena of immaturity, in an extension of the main thesis of the paper. The editors explain how, despite the indictment of play as a subject not suitable for serious (i.e., experimental) scientific research in psychology several years earlier (Schlossberg 1947), ethologists studying non-human primates had found that it was the central activity in primate infancy, especially so in apes. This suggested that there must be something very seriously important about play: "… in the evolution of primates, marked by an increase in the number of years of immaturity, … the selection of a capacity for play during those years may have been crucial."

The aim of this compilation was to help place play and its associated phenomena under the focus of attention of psychology and its allied disciplines in trying to unravel the mysteries of evolutionarily selected immaturity.

Bruner thus placed immaturity in an evolutionary context, but at the same time (and herein lies one of the key contributions of the paper) he showed how biological immaturity was inextricably linked to cultural and educational practices. Nature and nurture are traditionally addressed as opposites. In his view, however, immaturity becomes nature's way of ensuring nurture. In previous years, Bruner had become increasingly interested in the social dimension of development. His developmental approach, after some disappointing Piagetian flirtations, had become definitely attuned with the Vygotskian view of development. Indeed, ten years earlier, Bruner had written the introduction to the first English translation of *Thought and Language* [more properly *Thought and Speech*]. Here a little digression about the profoundly evolutionary roots of Vygotskian psychology might be in order, since this aspect of the Russian psychologist's ideas is not so widely known.

Vygotsky: From Natural Intelligence to the Socially Developed Mind

As is well known, Vygostky emphasized the role of social interaction, cultural practices, and language in the development of thought and intelligence—not a facilitatory role, but a *transformative* one. However, Vygotsky's approach was

profoundly evolutionary. A good demonstration of this was his enthusiastic reception and promotion of what in the 1920s and 1930s was the state of the art in ape research—the work of W. Köhler on chimpanzee tool use (1921, 1927), where the Gestalt psychologist argued that he had demonstrated the existence of intelligence of the human kind in chimpanzees.

By 'intelligent' Köhler understood the ability to perceive the environment in a structured way and solve practical problems with actions adapted to the structure of the situation (or the part of it that the chimpanzees were capable of understanding). For example, a chimpanzee picking up a stick and using it to retrieve an out of reach banana, or piling up boxes to build a tower towards a hanging piece of food (this latter procedure typically executed with a dreadful sense of balance leading to frequent disasters, thereby demonstrating at the same time insight into some aspects of the problem—the need and goal of building higher towers— and lack of understanding of other aspects—visual cues to the statics of objects). Chimps acted with at least partial insight into practical problems, not with the blind, random reactions that Thorndike (1898) had reported a few years earlier in his cats struggling to get out of a puzzle box whose mechanisms were hidden. Köhler concluded that Thorndike was wrong in denying animal intelligence: his own experiments demonstrated that at least chimpanzees, devoid of language, showed practical intelligence of the human kind.

This challenge to connectionism and associacionism was badly taken by Ivan Pavlov in Russia, who denounced it as a return to idealism and dualism in psychology. Pavlov repeatedly argued that his conditioned reflexes, so famously illustrated with dogs, were enough to explain Köhler's supposed examples of insightful intelligent behaviour in apes, any differences being due just to the many more possibilities of reaction that the finely articulated bodies and manipulative hands of apes allow in comparison with dogs (Gómez 1989).

In contrast to this hostility, Vygotsky saluted Köhler's work as a key contribution to his own view of human intelligence. In his introduction to the Russian translation of what in the English speaking world is known as *The mentality of apes* (Vygotsky 1930), he hails this work as a fundamental contribution to Darwinism: "Köhler's experiments provide for the first time an empirical foundation to Darwinism in its most critical, important and difficult aspect: that of psychology,…" For Vygotsky, Köhler had found the missing link in the origins of human thought, and one that he was prepared to use as a perfect point of comparison to illustrate his view of human intelligence and development (Gómez 2004).

Vygotsky argued that when Köhler's tests were given to human children, although in many respects they behaved like the apes, there was something that kids did differently, especially older kids: they talked and tried to recruit the help of others for solving the problems, and this placed the development of their natural intelligence on a completely different path to the apes.

The natural intelligence of children, initially independent upon language, is set to be amplified and *transformed* by social (the help of others) and semiotic (the use of language and other signs as cognitive tools) mediation. For example, children will be able to overcome some of the funny difficulties found by apes (e.g.,

their problems to 'see' how to use a stick when this is perceptually far away from the goal, or their problem with the statics of stacked objects) by using language as a tool to overcome the perceptual limitations of natural intelligence.

Vygotsky thought that this social and semiotic mediation was unique to humans, the key ingredient that differentiated human from animal thought. Kohler's chimpanzees demonstrated that there is intelligence without language above reflex associations (with apologies to Pavlov!). Humans transform this natural intelligence into a more powerful, amplified intelligence through the use of semiotic mental tools acquired through social mediation.

Primate Evolution of Educability

In his Oxford years, starting immediately after the immaturity paper, Bruner set out on a line of research that in retrospect can be described as an exploration and amplification of this aspect of Vygotsky's ideas—the role of adult-infant interaction in guiding children's acquisition of language as a communicative (and cognitive) tool, and the role of the mechanisms of social tutoring in the development of problem solving skills (e.g., Wood et al. 1976).

Thanks partly to his pioneering work of those years, we now know that infants are indeed on a socially mediated developmental pathway well before they have to deal with Köhler-like problems. Their infancy is carefully 'scaffolded' (to use Bruner's trademark term) both for dealing with the world of objects and for entering into the all-important world of words.

However, one thing that the immaturity paper indirectly highlighted was that Vygotsky had gone too far in stressing the discontinuity between humans and primates in social mediation. The new knowledge that had started to be accumulated about the natural life of primates well after Vygotsky's death showed a picture of a phyletic order devoted to and dependent upon sociaI life. Especially in infancy, the immature primate could not survive without the mediation of their parents (see for example Gómez 2004).

Interestingly, Köhler himself had already remarked that the single most serious problem he faced when testing chimpanzee practical intelligence was that the apes always tried first to recruit the help of a human to reach the bananas! In a systematic study of the ability of gorillas to recruit human help in solving practical problems, we confirmed years later that apes indeed use gestures and forms of joint attention to request that humans do things for them (Gómez 2004). The tendency of the immature to expect help from the mature members of the species (or in this case, the phyletic order) is not exclusively human, but part of a primate pattern—as seems to be the tendency of the mature to help the immature. Educability (as captured by the above sub-heading, taken from the title of one of Bruner's talks preceding the immaturity paper) is a product of primate evolution. Bruner's take on human immaturity as part of a more general primate trend situated the social cognitive approach in a better informed evolutionary context than the already evolutionarily committed approach of Vygotsky.

Today we know that many of Bruner's intuitions in the immaturity paper were right, in some cases even more far reaching than he anticipated with the meagre and vague, albeit pioneering, array of primatological data he had at his disposal in the early 1970s; other times, developments have followed unexpected directions. For example, we know that the distribution of cognitive and social skills in animals is less 'échelle des êtres' and 'scala naturae' than it looked in the early 1970s. Tool use and flexible skillful action are surprisingly present and complex in such unlikely species as corvids, apparently sometimes with levels of sophistication that rival or even surpass those of primates (e.g., bending wires to make hooks; see Sanz et al. 2013, for a recent compilation on animal tool use). On the other hand, surprising social cognitive skills are present in non-primate species such as domestic dogs, and the supposed radical divides between prosimians, monkeys and apes are more blurred and nuanced than thought at the time (see Call and Tomasello 1997, for an early realization of this).

In the realm of imitation, observational and socially mediated learning, to which Bruner devotes so much space in his paper, there has been a particularly fruitful wave of progress. For example, the pattern of natural variation and distribution in types of tool use in wild apes suggests cultural transmission processes at work. This was forcefully conveyed in 1999 in a paper led by Andy Whiten, who had been a postdoctoral member of Bruner's research team during the Oxford years, in which the foremost field primatologists put together their findings suggesting that variations in tool using practices of wild chimpanzees reflect processes of cultural transmission (Whiten et al. 1999). The psychological mechanisms for such cultural transmissions are the subject of intense investigation and debate and some of these processes may be phylogenetically wider than primates (e.g., Laland and Galef 2009), thereby providing an even deeper biological foundation for the cultural and educational mentality of humans.

As is always the case in comparative studies, one of the challenges is to disentangle the complex pattern of continuity and discontinuity in the mechanisms of social learning of humans and other animals—what is shared and what is uniquely human? This is particularly well captured in the developmental psychology of Mike Tomasello and his collaborators at the Max Planck Institute of Evolutionary Anthropology, which represent the foremost current incarnation of the Vygotskian view that Bruner mediated into Western psychology. One of Tomasello's aims is to pinpoint what is the breaking point in the evolution of human infants that dramatically and uniquely might set them apart from the social cognitive skills of their ape cousins: shared and communicative intentionality? Unique cooperative motives *à la* Trevarthen? The cognitive motivations and abilities for explicit teaching? (See, for example, Tomasello 2009).

But before saying more on this, let us return to the immaturity of primates and what we can learn through cross-primate interaction.

Natural Experiments on Immaturity: Immaturity Through Captivity

The immaturity paper was an exercise in cross-disciplinary reflection and exploration, a brainstorming attempt at suggesting that a diversity of findings, questions, and approaches across disciplines should be put together to make sense of such crucial matters like the nature of human development, education and knowledge.

There was more (and in a sense also *less*) in that paper than I am discussing in this chapter. When re-reading it now in preparation for this article, I was surprised to discover that many of the specific ideas that I thought I directly received from the paper are actually there only in a sketchy, hinted at form (more like pointing at them with the index finger, than spelling them out!). My access to this paper was 'mediated' by José Linaza, my PhD supervisor and devoted disciple and friend of Bruner, who biased me into reading and amplifying its primatological and evolutionary dimensions. I was at the time starting my work with hand-reared gorillas in Madrid Zoo, trying to explore their spontaneous, pre-verbal means of communication with humans with the aim of comparing them with the pre-linguistic communication of human infants that Bruner and others (most notably Bates et al. 1975) had been investigating in the 1970s and early 1980s.

Interestingly, our ultimate aim in this study with captive, orphaned gorillas that had to be hand-reared by humans acting as part-time surrogate adults, was initially to try to teach them some artificial language *à la* Premack or *à la* Gardner. (The 1970s had been the years of the linguistic apes experiments.) However, we had the good sense of first trying to find out how the gorillas would interact and communicate spontaneously with us before teaching them anything. And we essentially stayed there: so fascinating and complex was what the gorillas did on their own!

The decision to look at the gorillas spontaneous ways of communicating with their human caretakers was partly motivated by the then increasingly important idea, again pioneered by Bruner, that to understand language acquisition one had first to understand the infants' system of preverbal communication (e.g., pointing gestures). As mentioned above, Bruner's Oxford years were driven by the idea that preverbal communication scaffolded and led the way into language acquisition (to put it in his catchy take on acronyms, any Chomskyan LAD [Language Acquisition Device] had to act in partnership with a LASS, [Language Acquisition Support System] to beget anything of interest).

Seeing language development as part of a wider network of social interaction and communication, Bruner was among those that promoted the importation into the study of child language of the philosophical views of the likes of Austin, Grice, and Searle, and the speech act theorists that he found in Oxford. The study of language acquisition was the study of how kids learn to do things with words (Bruner 1975), and to understand this one must first understand how they have learned to do things with gestures.

In our gorilla study, a recurrent discussion topic was how captivity amounted to rendering the gorillas artificially more immature than they actually were. For

example, despite being motorically more advanced than human infants, captive apes have to rely on humans to get their food or to reach anything interesting situated outside their cages. This artificially enhanced dependence upon others seems to have an extraordinary effect upon the apes: they spontaneously develop forms of communication, such as whole hand pointing gestures, that are not common in their intra-specific interactions in natural conditions.

Let's focus on this trademark of infant prelinguistic communication—the pointing gesture. Pointing seems to be almost completely absent in wild apes (despite being a prime candidate to be the missing link in language evolution, a referential tool requiring no speech, capable of reference but with no built-in semantic content, and ideally suited to scaffold language acquisition). However, it is enough to place an ape in a cage for quasi-human, whole-hand pointing gestures to develop (if you want them to become almost entirely human-like in form, add a narrow plexiglass hole to the cage bars and the apes will preferentially point with their index finger through it). Moreover, the apes use their gestures coordinating them with joint attention behaviours (for example, looking at the eyes of the other and calling their attention, much as human infants do (see Gómez 2007 and Leavens et al. 1996).

One interesting difference between the gestures of apes and infants is the expansion of the communicative motives that human infants display. To use the celebrated terminology coined by Bates et al. (1975), apes typically gesture *proto-imperatively*, to request things, whereas human infants also do so *proto-declaratively*, to share attention upon interesting things for their own sake. This led some authors to suggest that maybe requests are primitive, whereas declaratives are cognitively more advanced (maybe an early manifestation of so called "Theory of mind"?).

It is in relation to this issue that Bruner and his collaborators made one of their, in my view, most interesting contributions to the study of early communication. At a time when requests were frequently considered as inferior and cognitively less demanding forms of communication, barely an example of operant conditioning, they highlighted their complexity and social subtlety.

Requesting is a key skill very directly linked to immaturity, a means of increasing the probability of getting the parental investments and resources that the immature offspring cannot get on its own. Maybe because of this, and because in some form or another, begging behaviours are present in many animals (e.g., the birds begging for the worm in their nests), they have some times been considered to require little cognitive sophistication. One of the great merits of Bruner's study on the beginnings of request (Bruner et al. 1982) is to show that requesting can be a very subtle, sophisticated skill. Requests are inherently complex. They typically require to show that one wants something, and also to indicate what is it that one wants. Moreover, this is frequently not enough to be successful. Bruner et al. (1982) emphasised that infants have to learn not only to indicate what they want, but crucially they need to learn and heed the "felicity" conditions of successful requests. Requesting must not only be clear and efficient. Children must also learn what requests are acceptable, when are they acceptable, how to deal with initial negative responses by ingratiating reluctant adults, etc.

And indeed our immature gorillas, despite not being in the business of proto-declaring, displayed a remarkable variety of ways of indicating that they wanted to request things and the things they wanted to request, and even some apparent attempts at using ingratiating strategies, such as engaging in play with the human that moments before had harshly denied something, only to interrupt the play once the caretaker's mood changed, and request again the previously denied thing. An account of some of our findings about the communicative exploits of captive gorillas can be found in Gómez (2004).

The studies of captive apes interacting with humans show something critically important for the problem of the role of immaturity in development. The dynamics of asymmetrical interactions between immature creatures and their competent caretakers can generate complex emerging forms of adaptive behaviour, even when this happens across species, and thus it cannot have been the target of direct selection in evolution. So much so, that authors such as Tomasello and Call felt the need to invent a label to refer to extensively hand-reared apes as "enculturated" and maybe in possession of specially sophisticated (amplified *à la Vygotsky?)* cognition beyond the species typical phenotype (Call and Tomasello 1996). A satisfactory analysis and explanation of the behavioural and cognitive development of hand-reared apes remains to be achieved.

Immaturity, Cognitive Precocity, and Interdisciplinarity Today

Having a quick look at some recent advances in current developmental psychology, one might get the impression that the idea of the immature infant is no longer appropriate given some recent advances in the field. Recent claims suggest that even such complex cognitive skills like understanding the false beliefs of others may in some essential form be present from the very first months of life, if not innate (e.g., Baillargeon et al. 2010).

A group of comparative psychologists (Povinelli et al. 2005), using the theory of parent-offspring conflict, recently speculated that the gaze following or pointing skills of human infants may in fact be "behavioural impostors," evolved to "fake" that they already have superior socio-cognitive skills of the Theory of mind type, when in fact they do not. The argument is that this may make their parents more inclined to take on the burdensome and resource consuming task of providing the extensive care they need, because they think that their offspring is somehow more valuable or of better quality. However, if we accept the *über-competent* view of infant cognition, it would appear that a more likely story would be to claim that infants have been selected to *conceal* their actual competence to elicit 'undeserved,' compassionate care from unsuspecting parents!

Whatever the cognitive seeds and predispositions present and growing in early infancy, infant immaturity and dependence upon others is the key feature of human development that Bruner highlighted in 1972. This is reflected at the

forefront of current research in developmental and comparative psychology, where there is indeed a focus on the nature of immature infancy and its extraordinary implications for the development of the species and the individual. Some of the key players in the scene are deep into the issue. To give but some snapshots of the state of the art in immaturity research, Mike Tomasello's take on *cooperation* and *shared intentionality* tries to find unique ingredients of the human mind that allow the development of what he sees as a uniquely human way of cultural development and cognition, in a perfect modern incarnation of the Vygotskyan view of the 1930s, that Bruner mediated through the 1960s and 1980s into psychology.

Advancing through different routes, Csibra and Gergely's (2006) notion of N*atural Pedagogy* reaches the same key point: most, if not all, of the surprisingly sophisticated social cognitive skills demonstrated in human infants during the last decades of developmental research can be interpreted as biological adaptations to being taught by others. Immaturity may be a ploy of nature to force infants and children to rely on being educated, but education is not the same as training by trial and error or learning *ex tabula rasa*. A good apprentice must be competent enough (have the necessary learning skills) to benefit from education.

On the other hand, social learning mechanisms and functions are being explored in all their glorious evolutionary depth and width by comparative and evolutionary psychologists (see, for example, Whiten et al. 2012), showing that the evolutionary roots and ramifications of the social and cultural mechanisms of development and evolution are older and more complex than previously suspected.

The nature and uses of immaturity are indeed at the centre of cutting-edge research, but not everything that was heralded in that paper has found its way at the forefront of the current scene. There is one theme from the immaturity years that seems to have somehow stagnated—Play. It is one of the dominant and most enigmatic activities of infancy both in primates and humans (and in its symbolic or pretend manifestations, one of the potentially unique features of human infancy; e.g., Gómez 2008), but it looks as if not much progress has been made in understanding human or animal play in recent years, and as if not much interest is currently invested in this key feature of human and animal infancy. Understanding play sadly remains one of the pending tasks of comparative and developmental psychology.

I would like to say one more thing about the special value of the immaturity paper. Maybe the most distinctive feature of Jerry Bruner is his almost compulsive cross disciplinary drive, present in all his work. His is a specially wide-ranging interdisciplinarity, not just across the sciences, but most crucially filling in the perceived gaps between sciences and humanities. The 1970s immaturity paper and play book compilation powerfully illustrated this: the far ranging integration from biology to education and sociology and anthropology, the wide ranging collection of play papers from the comparative description of laughter and smile to the foundations of civilisation through tool use, problem solving, cooperation and competition, sex roles, games, cultural indoctrination, language, symbols, and creativity. One of the most important lessons from Bruner's career is indeed that cooperative interaction is also the best recipe for growth in the sciences and humanities. In

the 1960s and 70s it was the full of promise, but 'immature' venture of cognitive science that was born and thrived out of the strength of the cooperative interaction across disciplines that Bruner so paradigmatically instantiated. Now, in arguably new times of 'immaturity' for psychological and cognitive sciences (times when old paradigms and assumptions are being challenged and new ways of scientific growth explored), maybe the time is coming to not only engage in interdisciplinarity (tending bridges between disciplines to exchange news and views about their respective achievements), but to explore forms of *co-disciplinarity*—scientists and humanists working together in the building of new knowledge from the beginning of the research enterprise.

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The Arts of the Hidden: An Essay for the Left Hand

Alan Kay

Jerry has written many essays over the years, both to communicate with others, and especially to help him think through ideas and issues. Montaigne was a famous precursor—and asked: "*Que sais-je?*" But unlike the French nobleman, Jerry asks not "What do I know?", but "*De quelle façon puis-je savoir?*"—"How do I know?"—and relies not solely on internal knowledge and deductions, but in a deep participation in both the methods and the communities of science.

Still, the sharing of internal thoughts before the careful scrutiny of science is also useful—especially Jerry's—and we were early treated to his "On Knowing: Essays For The Left Hand",[1] writings about the arts and other topics deemed suited for the less careful parts of our minds.

We celebrate Jerry with just such an *"Essai"*[2]: the left hand is happiest when most carefree!

It is difficult to define "Art" with a capital "A" beyond the simple observation that "art" with a lower-case "a" means "making with skill and knowledge", and that the capital "A" requires something special from both artists and their audiences. Instead, we observe how we acquire and use context, and our reactions when we encounter things that don't fit.

[1] Bruner (1962).

[2] "Attempt", "explore", etc. and drawing on a talk dedicated to Jerry for the Kay (2015).

Article Note
Dedicated to Jerome Bruner, to celebrate his 100th year of advancing civilization. We love you Jerry!

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A 19th century metaphor for learning and remembering has rain moving a chance piece of dirt to make a little random channel more efficient at carrying water, leading to further erosion, and eventually a large deep gulley.[3] (In other words, we remember best the things that are like what we already remember, and our thoughts tend not to flow as easily elsewhere[4]).

The Grand Canyon is a really large pinkish erosion gulley! We could imagine growing up in the canyon and only experiencing "pink", and never thinking to look up. As Marshall McLuhan liked to say "I don't know who discovered water, but it wasn't a fish!" He meant that if everything were pink, we would not see "pink". We could spend whole lives, whole generations, coping with our pink world without even getting the idea that there might be a category "colors", and much more and different outside, or even the idea of "outside".[5]

What our mind thinks it knows affects even simple perceptions. A good example is the illusion of "size constancy". An experiment can be done with familiar objects such as quarters, oranges, or thumbs, etc. held so one is twice as far away as the other. Even though the image on our retina has the farther away one at half the size of the nearer object, the knowledge they are the same size produces a subjective "perception" that the farther away one appears almost the same size (about 80 % of the size).

An early landmark paper of Jerry's[6] showed that a rich or poor background would influence the subjective size if *coins* were used! The deep idea here is that what we think of as "normal" and "reality" are just beliefs that distort perception even of directly experienced evidence.

A vivid example of human difficulties with direct experience happened in the "Hammer Attacks" in New York City. On May 11th 2015, four people were attacked by a man wielding a hammer.[7] On May 13th he attacked a female policeman, and was shot by her partner. Eyewitnesses on the scene reported different versions:

> Moments later, Mr. O'Grady spoke to a reporter for The New York Times and said the wounded man was in flight when he was shot. "He looked like he was trying to get away from the officers," Mr. O'Grady said.[8]

> I saw a man who was handcuffed being shot," Ms. Khalsa said. "And I am sorry, maybe I am crazy, but that is what I saw.[9]

[3] A different slant and examples on some of the same ideas in: Kay (2007).

[4] Cf. Ausubel (1978).

[5] For example see: Heinlein (1941).

[6] Bruner and Goodman (1947).

[7] http://nypost.com/2015/05/12/two-women-attacked-by-suspicious-hammer-swinging-suspect/.

[8] NYTimes, May 14, 2015.

[9] NYTimes, May 14, 2015.

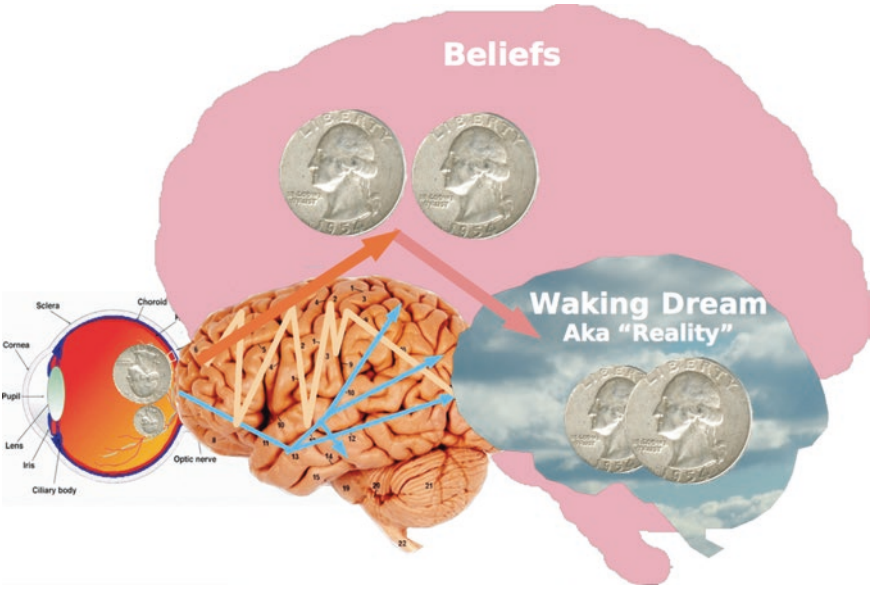

Fig. 1 The images on the retina are routed through many parts of the brain, including the processes that manifest our beliefs. These affect the processes that manifest "consciousness" as a kind of "theatrical production" to form our "Waking Dream"

However, there was also a surveillance camera that caught the action. It showed that none of the eyewitnesses were even close to accurate[10]: the assailant was still chasing and swinging the hammer at the female policeman when he was shot by her partner.

Mr. O'Grady and Ms. Khalsa were not "crazy", but like the rest of us are "normal", which is to say, at best "unsane"[11] In other words, as a species, we *normally suffer from "hallucinatory and delusional disorders"*!

One way to picture this is that the *processes* that arise in the workings of what we like to call our "mind", include (a) a large pink gulley-context: our "beliefs", and (b) a near real-time running overview we can call "the dream" (see Fig. 1).

The dream is made from our attempts to make sense of sensory information both external and internal via our beliefs and other limitations, and is essentially a real-time waking hallucination that we like to call "reality". Another nice zinger by McLuhan: "If I don't believe it, then I can't see it!".

The dream requires constant reference to our environment (as anyone who has tried an isolation tank[12] trip can attest—15 to 25 min of no sensory feedback are enough to allow the kind of dreaming one has while asleep to happen while we are

[10]YouTube, https://www.youtube.com/watch?v=eh-H0FIAL2Q.

[11]Korzybski (1933).

[12]Invented by John Lilly: https://en.wikipedia.org/wiki/Isolation_tank.

Fig. 2 Mrs. Flexer's three stages of fear, relief, and happiness

awake). Still, almost half (47 %) of challenged calls made by professionally trained baseball umpires are overturned.[13]

A second early landmark study in cognitive science was "The Magic Number 7 plus or minus 2" by Jerry's colleague George Miller.[14] This was initially related to short term remembering of number, letter and word sequences, but is now a useful simplified generalization for our limited capacities to deal with ideas. Recent studies have demoted us to 4 ± 3, and it is likely even smaller for more complex ideas not previously encountered. This means that we can be surprised even by things that are in our context, but are not currently in our "4 ± 3".

A good example is a surprise party (there are lots of these to be found on YouTube these days). In "Mrs. Flexer's Surprise Party[15] we see the first grade teacher Mrs Flexer initially frightened half to death by the unexpected sight in her classroom of 30 of her old students. This possibility was in her context and beliefs, but not in her "4 ± 3", so she was initially very frightened, but as we see in Fig. 2 a few minutes later, was quite happy.

Her summary forgot the initial fear: "It was the coolest thing that could've ever happened in my life!" [16]

PET[17] and fMRI[18] scans and other observations show that a context violation producing a large surprise energizes the "fight, flight or submit" response. This triggers adrenaline for hyper attention and possible energetic actions, and also neurotransmitters such as dopamine and serotonin which act as pain relievers (in case something painful has to be done to escape the danger). If there is no danger, then the person is left hyper-alert and full of natural opiates: a very pleasant and happy experience![19]

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[13] http://baseballsavant.com/apps/replays.php.

[14] Miller (1956).

[15] https://www.youtube.com/watch?v=veuSc9ZhpPY.

[16] http://www.today.com/news/goodbye-ms-flexer-students-41-years-surprise-teacher-1D80064803.

[17] Positron Emission Tomography—https://en.wikipedia.org/wiki/Positron_emission_tomography.

[18] Functional Magnetic Resonance Imaging—https://en.wikipedia.org/wiki/Functional_magnetic_resonance_imaging.

[19] Cf. Huron (2008).

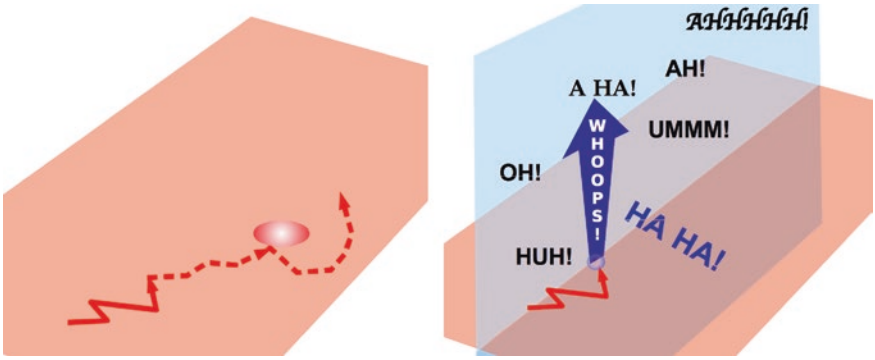

Fig. 3 The pink gulley world made into a "thought plane" seems complete until something forces awareness of another context

The surprise reaction is detected and triggered by what Daniel Kahneman[20] calls "System 1", the neural mechanisms that can quickly match against a situation in real-time. He terms "System 2" the more cognitive thinking mechanisms that take longer to work, but which can better assess what is going on.

An important property of "System 1" is that its reaction is almost independent of what "System 2" knows. So one can watch a door being slammed in a perfectly safe situation, and will still get a burst of adrenaline (because we are genetically sensitive to loud noises, regardless of their cause). We can get on a roller coaster over and over, because even if we know it is perfectly safe (most of us would not get on unless it were), we will still get the thrills and chills. And we can play "peek a boo" with a child over and over for the same reasons.

It's important to point out here that the "System 1" and "System 2" terms should be taken as distinctions useful for discussion, rather than as literal mechanisms. Kahneman calls them "expository fictions", and they join the other useful fictions employed in this essay.[21] (As one should expect, most things mental are more complicated than simple discussion can characterize.)

If we take the pink gulley world we live in—our beliefs where we can't see "pink"—and flatten it out as in Fig. 3, we can liken human thought to an ant crawling around. The ant can pick directions and goals, encounter and surmount obstacles, and lead a rather full life without being aware of non-pink things and more than 2 dimensions. But perhaps in an unguarded moment we might have an outlaw thought: a *blue thought*. However, we've been brought up pink, we've been to school, to church, etc., so there is a usually a "*Kersplat!"* that knocks out the renegade idea.

Still we might be just waking up, taking a shower, or out for a run, and a blue thought forces its way upwards out of the pink gulley. We get a *"Whoops!"*, and

[20]Kahneman (2011).

[21]Examples of mental "expository fictions" about the mind: Charles Hampton-Turner *Maps Of The Mind*, Collier/Macmillan (1981).

this change of context brings System 1 reactions of a surprise, and System 2 contemplation about what just happened.

As Arthur Koestler pointed out in "Act of Creation", we have reactions of the "AH type".[22] If what just happened was a joke we get "HA HA!"—a discovery: "A HA!"—an artistic or religious or meditative escape" "AHHHHH!". And there are also "HAH!", "UH!", "UMMMM!", and others.

Many of these are mixed. For example, a scientific or mathematical discovery is often an "A HA!" and a "HA HA!" because neither nature nor math changed anything just to accommodate us. Like a joke played on us by our nervous system, it was there the whole time, we just couldn't see it.

A glass blower friend once held up a beautiful red-hot molten "gather" of glass and said "If I could, I'd take a bite out of this!" The delights of the arts are a form of love, and we want to merge with our beloved. So we need to add "YUM!" to our list of "aesthetic exclamations".

The "anticipations" and "surprises" are just parts of larger reactions, but even in deeply developed art forms the "peek-a-boo" factor via System 1 is likely to be operating. An early classic study by Anne Blood and Robert Zatorre[23] using real-time PET scans looked at musicians and their favorite "goosebump" sections. Their chosen sections were both quite reliable—they would induce the feelings over and over—and they were rather idiosyncratic to each person (one person's goosebumps inducers were not necessarily another's). The repetition of the induced feelings indicates that the surprises are partly of the "peek-a-boo" type. Using musicians as subjects—who quite understand the "semantics" of the musical structures—highlights the powers of System 1 to transcend understanding and simple anticipations.

Anyone who has done a lot of theater will have had the same experience of thrills and goosebumps on the umpteenth time hearing a great line of Shakespeare (it usually doesn't happen every single time, but it does happen over and over). Another example is a Mass experienced by believers. Every part of the ritual has been experienced over and over, and yet for so many, the other world opens and embraces. If we stay with the System 1 and System 2 "fictions", then we could say that System 1 is so hugely rooted in a particular take on "reality" that "peek-a-boo" can work well in many areas (especially with careful preparation of the environment).

This suggests that "System 1" is not so much like a simple massive neural net, as might first be thought, but is possibly more like caches of interlinked memories of experiences both small and large, perhaps resembling Marvin Minsky's "society of agencies" suggestions.[24]

[22]Koestler (1967).

[23]Blood and Zatorre (2001).

[24]Minsky (1988, 2006).

Paul Hindemith calls the process of listening to music a "co-creation" and "co-construction".[25] The listener is following and anticipating the composer's thoughts in the music, and will get quite confused if no predictions turn out, and rather bored if every prediction turns out. But, if what happens is *a surprise that can then be seen as great*—but not anticipated—then we start to have the chills, the goose-bumps, the oceanic out of body experiences, the transcendences, that are the gifts of Music, and of Art itself.[26] We have been led into "the blue plane". For both the performer and the listener, the phrase "making music" is quite apt; we can see that this co-creation obtains strongly in all the Arts, especially the performing Arts.

Coleridge, who was a theatrical critic as well as a poet, once wrote that people go to bad theater hoping to forget, but go to good theater *tingling to remember*. The theatrical process is very similar to the co-creation of music, and also very much aimed at the different ways that System 1 and System 2 react to surprise. In the trade, the theater is often called the "Magic Mirror"[27] because one of the main aims of serious theater is to reflect the audience's intelligence and knowledge back out at them in ways that get around their current context. It is hard to teach something important in a few minutes, but one can get people to *remember things that aren't in view*, and often get them to place the recovered memories in a more powerful perspective for thinking about them. There is more than a tinge of hypnosis in the Magic Mirror.

For creative ideas—where we are both the leaders and the followers—part of the process is a loosening of the enforcement of our beliefs on our waking dream to allow a momentary slip into the less constrained worlds of our sleeping dreams. As Whitehead pointed out "… almost any idea that jogs you out of your current abstractions may be better than nothing!"[28]

The emotional exclamations—they are not exactly category words, but stand-ins for feelings—also allow us to avoid having to define "Art". We are interested in all processes that catalyze an escape into different contexts and perspectives.

When we hear from scientists and mathematicians—for example, Richard Feynman—that scientists and mathematicians have the same kinds of feelings, utter the same kinds of noises, etc., we have to contemplate the idea that science, mathematics and technology are high art forms on a par with the highest of the official arts.

A big difference—one that has led to many misperceptions of science, mathematics and technology—is that the traditional arts are in terms of our senses—sensual, sensational, sensical …: massage and lovemaking, cooking, painting, theater and ballet, etc. And music—which Leonardo termed "the science of the invisible"—is still sensibly audible, and *playing music* is deeply sensual: it's a

[25]Hindemith (1952).

[26]A number of these ideas have been viewed through a modern perspective by David Huron, in *Sweet Anticipation*, his excellent detailed analysis of "music and the psychology of expectation" (also cf. footnote 19).

[27]Nathan (1960).

[28]Whitehead (1997).

"YUM!" By contrast, most of what is important about the Arts of the Sciences, Maths, Systems, etc., are "*non-sensical*": so methods have to be found to bring them into our limited ways of thinking and knowing. There are deep "YUM!"s here, but of a different sort.

Einstein at 4 or 5 years old was given a compass, and this radically changed his outlook. He recalled: "I can still remember…that this experience made a deep and lasting impression on me…. *Something deeply hidden had to be behind things*". We could call the New Arts of the Sciences, Maths, Systems, etc., "The Arts of the Hidden". And, we mustn't shortchange the traditional arts on this score. For example: "And sometimes, *as was the case for Bach, the notation was designed to hide from everyone but the initiate, solutions to tuning, tempi, pulse, and meaning—a 'hidden art' underlying the surface"*.[29]

Frank Oppenheimer's Exploratorium[30] was criticized by some as "not being a real science museum". Frank explained: "You don't understand. The first door that has to be opened for understanding science is that '*the world is not as it seems'*. Here we have 500 different hands-on exhibits that show this in different ways. With 2000 children at a time, there is a good chance that a particular child will find the particular exhibit that will trigger this monumental insight. They will then be living in a different world."[31] Kahneman's term for our blindness to this world is WYSIATI: What You See Is All There Is.

What are important in this different hidden world are not in the form of stories, and even softer forms of narrative don't serve well. They are relationships and "relationships of relationships"[32] and "systems" whose "parts" mutually influence each other. We also need to take into account that even the notions of "parts" and "interrelationships" are really in the viewing apparatus we've invented to help us make sense of what seems to be opaquely complex.

An early start for both mathematics and the sciences came from taking the Earth as a "hidden" and trying to find its nature through measuring and making accurate maps for navigation and exploration. By the late 18th century, pocket globes that showed what our entire planet looked like from space were exhibited and discussed in the coffee houses of Europe. 200 years later we were able to get out there and take pictures, and found no surprises (to no one's surprise). The pocket globes were the result of early *scientific processes* to *make the invisible more visible*. The photos of the Earth from space were the result of *engineering*: a great feat but wonderfully anticipated by the powerful methods of science for dealing with the hidden, and getting around the problems our brains have with beliefs influencing our perceptions and conclusions.

A British survey document from the detailed mapping of India is a good example, analogy and metaphor (Fig. 4). We see interlinked triangles that represent survey measurements (the triangles are visualizations of the abstract relationships).

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[29]Feinberg (2014).

[30]San Francisco, USA—http://www.exploratorium.edu/.

[31]A reasonably accurate paraphrase of Frank Oppenheimer's explanation of what the Exploratorium is all about.

[32]John von Neumann's characterization of mathematics was: "relationships of relationships".

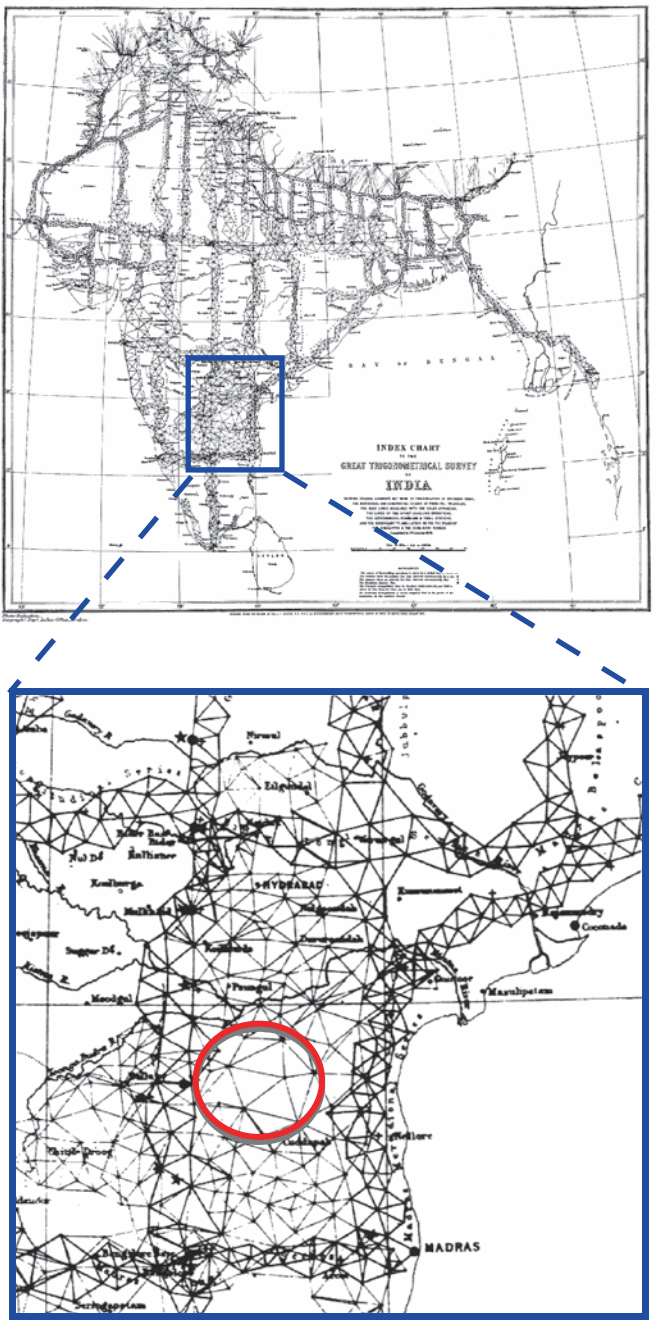

Fig. 4 The survey of India

Fig. 5 Nope! This isn't what is beautiful about Maxwell's equations!

Mathematical connections can share exact points in "idea space". Physical measurements will have some error to them. Measuring out triangles in the physical world creates a *region* instead of a point, but most of the time the region will contain the location of the join. Another word for "error" in this game is the term used in engineering: "tolerance".

We can see that these ideas relate the three fields: we are interested in the *model* made by mathematics and the kinds of reasoning we can do. We are similarly interested in the *differences* between the model and "what's out there?", and in the differences in the model caused by our *limitations in measurement and reasoning*. These differences require a *"larger kind of reasoning"* to be done in science and engineering than in mathematics, even if the gross reasoning is quite similar.

We can see no story here, no beginning, middle or end. We do see a system of interrelationships shown as an ideal with annotations of disparities. Done carefully, we wind up with *a very accurate version of "false"* that can be visualized as the Earth from space. Carried out really carefully—as can be done today—we can track the detailed dynamics of our planet's surface.[33]

This "finding things out" by indirect means—sometimes amazingly indirect—is often quite beautiful both in methods and results.

Though we could "illuminate"[34] words, or musical scores, or math equations,[35] this misses that *the beauty is several steps removed from the forms*; we use our minds to bring the meaning vividly to life. Fluent "readers" *live in meaning*: the forms are almost completely factored out of subjective experience.

This process is taken much further in the "reading" of symbols depicting the hidden: what needs to come to mind is not something in the sensual world, but "a sense of processes and relationships".

[33]For example the LA earthquake of 1994 lowered the hills above my home by about 11 inches. The San Andreas fault is moving at about the rate of 2" per year.

[34]Cf. de Hamel (1986).

[35]Illuminated "Maxwell's Equations" https://twitter.com/rlystad/status/526750612621246464. Also see Walter J. Miller (1959). Fig. 5.

As we have seen, once we understand that our beliefs distort both our perceptions and inferences, we can literally "take measures" to get around some of the "noise" we bring to the party. We can measure what we see to find out what is coming into our eyes, as artists often do, and when we can't see the whole, we can measure parts and how a part fits with another part, as is done in surveying. When we can't see or feel anything, as in magnetic and electric fields, we can invent instruments that can sense what we can't sense. Similarly we can invent reasoning instruments, such as mathematics and computer simulations, to help us think better in virtually every case where we are trying to think at all. Where the six blind philosophers each came up with a local theory about the parts of the elephant they could touch and wound up fighting each other, six blind scientists "can find the elephant".

A crucial principle that pervades this new way of thinking is that where combinations of messages—such as the different points of view of the blind philosophers—can increase confusion and "noise", *it is often possible to come up with ways of combining perspectives that removes confusion and noise*. This is one of the largest and most important discoveries of our species in all aspects of thinking and making.

This way of looking at science can be traced at least to Francis Bacon[36] who listed some of the ways we human beings fool ourselves—through genetics, culture, language, seeming knowledge—and called for methods to deal with our errors of perception and judgment. One of the crucial sources of our noise are many internal reasons for clinging to beliefs-as-reality. Even people who are trying to think well have great difficulties getting past how their System 1 affects their System 2, so a lot of the "de-bugging" and "de-noising" of ideas is best done by others, who do not have as large psychic investments in a particular claim. A good way to characterize this is that *science is the processes we've come up with to avoid falling in love with our own ideas!*

A human society may have stories, but it is a system, not a story. Until relatively recently most of the systems elements of societies (and of most systems themselves) have remained hidden and not thought about. Most societies evolve from traditional patterns—erosion gulleys again!—but sometimes there are attempts at design, especially more recently, and especially correlated with a writing system that allows more complex, often abstract, relationships and processes to be represented and discussed and revisited—Marshall McLuhan's nice line: "You can argue a lot of things with stained glass windows, but democracy is not one of them".

For example, Tom Paine's "Common Sense"[37] is not just an argument against the idea of monarchy, but proposes that something better can be purposely designed: "Instead of the King being the Law, why we can have the Law be the King!"

[36]Cf. Bacon (2000).

[37]Paine (1776), cf. Dover.

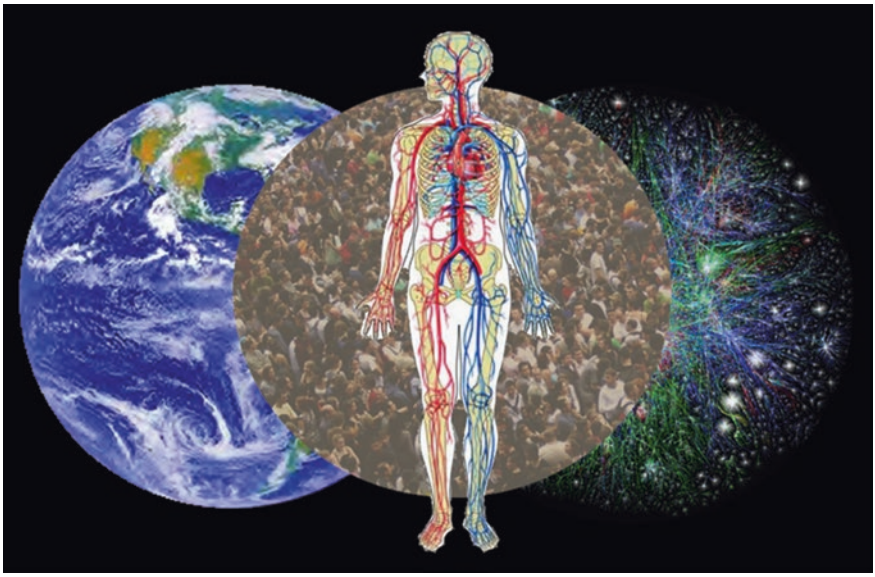

Fig. 6 The systems we live in, and the systems we are: physical, societal, technical, and personal

The Constitution of the United States is similarly not a story, but more like a systems design. In modern terms, it is a kind of "operating system" for citizens and the state: millions of not terribly cooperative processes, but without a complete crash[38] for several hundreds of years now. It is also a great work of Art, in all the senses we've been discussing, and is one of the most important examples of an "Art of the Hidden". (It is also far from perfect, both in terms of addressing the needs of a society, and in having enough error detecting and correcting methods to prevent crashes and allow more creative growth.)

We can depict "*the systems we live in, and the systems we are*": with nature to the left, human society in the middle, technology to the right,[39] and ourselves front and center (Fig. 6).

The intertwining of relationships within and without the parts of this poster are hidden, complex, and mostly undreamt until the last few centuries of the several hundred thousand years our species has been on the planet.

We need to learn the Arts of the Hidden, not just because they are beautiful, and not just because they are powerful, but because *they are intricately intertwined with every aspect of human life and the life of the planet itself*. In other words, understanding the Arts of the Hidden is as important to modern society as is the learning of fluent reading and writing. Learning something difficult and

[38]The Civil War represents a failure of a large part of the system, but enough repair happened to prevent a total crash of the Union.

[39]A self portrait of the Internet.

challenging because one is "called" to it is one thing, but setting up societal programs for *helping everyone learn a subject fluently* have had very mixed results.

An important idea about any kind of learning—even areas that are deemed to be "cognitive" and part of the "slow thinking" apparatus of "System 2"—is that the real-time nature of the "atoms" of slow thinking will *require considerable learning by the much more recalcitrant "System 1"*. Jerry's signature challenge, hope, and belief is central here: *"… any subject can be taught effectively in some intellectually honest form to any child at any stage of development*".[40] This certainly has been shown to work for many sports, music, art, dance and theater. But what about the arts of the hidden?

For a good example of how many kinds of learning work, let us recall what it was like when first learning to drive a car. There are too many things going on! We are not aware of much ahead of us, and nothing to the sides, we can't remember what gear we are in, we are wandering all over the road, we are going too fast, and we can't hear our parent trying to help. Some weeks later System 1 has built many "awareness processes" and reactions for us that detect stop signs, children playing, how fast we are going, a "what gear?" rememberer, a non-overcorrector to help keep us straight, and we can now hear and talk to the person next to us. Still, the cognitive loads of driving have not been reduced to nothing. A nice observation of Einstein: "Any man who can drive safely while kissing a pretty girl is simply not giving the kiss the attention it deserves"!

We find similar patterns of learning as we move to more opaque areas. For example, writing is visible, but the idea of writing down language was hidden until very recently (5000 years ago, about 2.5 % of our species' estimated time on the planet). Writing counts as an invention, and it is more difficult to learn to read than to use our more genetically disposed processes to learn to speak. For one thing, learning to read a writing system co-opts different parts of our brains than those we use for oral understanding.[41] For alphabetic writing, where much initial material is one-for-one with oral use, we still find that the early stages require a considerable amount of System 1 learning. For whole society learning of something difficult, where does the motivation come from for those who are not so interested? In pervasively literate Finland for example, reading and other parts of education were made *intrinsic parts of the culture* alongside traditional learning of customs and mores. The embedding of "subjects" into the cultural environment as "customs" was earlier recognized and used by Maria Montessori, that great genius of teaching and learning, and later by Shinichi Suzuki in the "Suzuki Violin Method".

An interesting example of a societal embrace of a subject normally considered to be a talent-based elective hobby was experienced by the author as a child in a small New England town which only had 200 students in the high school, yet had a tradition of having a full band, orchestra and chorus. This required that almost every

[40]Bruner (1960).

[41]Wolf (2006).

child become a fluent musician. They taught us to sing all the intervals and sight-read single parts in first grade. In second grade we sang two parts. In third grade we sang four parts and started to choose instruments. Predisposition was not a factor, though of course it did show up. This was something everyone did, and everyone enjoyed. Part of what seemed to make it work was that the community had an excellent musical specialist who visited each classroom several times a week to help the teachers, who were not trained musicians, to keep the quality at the needed level.

What needed to be done to train "System 1" fluency—the "art" with a small "a"—was embedded in every process of the Artistic parts of music that are the center of why most humans enjoy it. Big differences here were that the process didn't segregate the population into performers and spectators, and the understanding and thoughtful parts of music were developed along with the underpinnings of real-time fluencies in the many areas that music requires. Most critically for societal learning of difficult subjects: though talent was a factor in the *range* of the results—some children turned out to be really good—*talent was not central for the entire group to learn to fluently make music*.

A front and center example of a designed curriculum for teaching the hidden is the amazing MACOS[42] (Man, A Course Of Study) endeavor, for which Jerry was a main force. It was aimed at three deep questions for an entire population of 5th and 6th grade children: *What makes us human? How did we get that way? How can we become more so?* Almost every part of the core content of cultural anthropology and its biological bases is not just hidden to most members of a human society, but many actively resist the ideas when put before them. We can think of Anthropology as the science which tries to see *us* "from space".[43]

The 5th graders got caught up first with their general interest in animals, and then especially with their built in interests about humans and what they do. A key successful idea of MACOS was to get the children so strongly involved in what was similar to their experience—both animal and human parents and children—that they could get past their genetic and cultural aversions to the differences and human reactions to "the other". A special turning point—making the invisible more visible—in MACOS learning happens when the children see that the Netsilik Eskimos are as human as they are, but have found different ways to cope with staying alive and making their way in the world. Cultures are "differences of method", not "differences of humanity".

Much of the classroom success of MACOS came from a process that was similar to the New England music culture. But the needed involvement of the parents was almost random, and the extreme cases where parents opposed the ideas of MACOS resulted in the entire system being pulled down within a few years.

Turning to fluent learning of real mathematics and real physical science, we find a compelling example in a 5th grade's encounter with the contrast between

[42]Dow (1991).

[43]Alan Kay, "Our Human Condition 'From Space'" (2003), http://www.vpri.org/pdf/m2003001_human_cond.pdf.

Fig. 7 We can paint cars from several perspectives, write programs to move them, and even leave dots behind

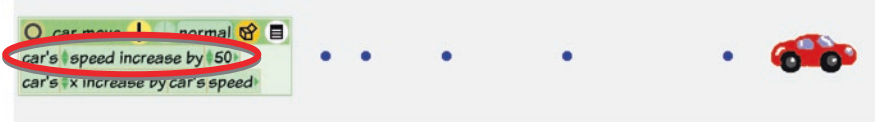

Fig. 8 Increasing the car's speed by a constant amount each tick. This produces a constantly accelerating car

Fig. 9 We can measure distances using stretchable rectangles from the left edge of a dot to the left edge of the next dot

Aristotle and Galileo. Using a computing system designed for their "stage of development" they first write programs that are a kind of mathematics to give dynamics to their own drawings (see[44] for a gist of how they learn and what it looks like).

In one exploration after a few weeks of playing with programming, they take a closer look at what they've been doing with movement. For example, the script below will add 50 "units" to the property "horizontal location" ("x") of the car picture, and then redisplay the car picture at the new location.

This moves it to the right. If this is done over and over (using the built in loop command) the picture will keep moving, and leave behind a horizontal trail of evenly spaced dots (see Fig. 7). "Speed" is distance traveled per a length of time, so this is an iconic and highly memorable representation of constant speed.

If we change the speed—"increase by"—a constant amount on each "tick"—50—we get an *ever faster* moving car, and the dots show visually what happened each tick (Fig. 8).

Even though the program says it is doing a constant increase of speed, it is a good idea for the children to check by measuring. They use translucent rectangles that can be stretched and fit over each other for easy comparison (Fig. 9). When

[44]Kay (2005) An expanded presentation of these examples including videos of the children doing the experiments can be found in Kay (2007).

Fig. 10 We can visually compare the incremental differences by stacking the translucent rectangles

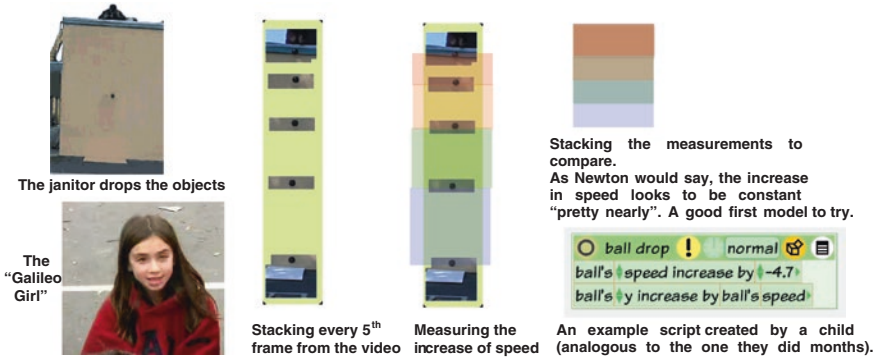

Fig. 11 The "Galileo experiment"

the measuring rectangles are stacked up (Fig. 10) each successive one seems to be "just about the same" distance longer, and this looks "just about" 50 units.

The "just about" is a "visual partner" for the exact measurement (as we will soon see).

The term for "increase in speed" is "acceleration", and thus this is "constant acceleration".

Some months later, the question of what happens when you drop something comes up, and the children are invited to find and bring in objects of many different weights roughly the size of oranges. So: shot puts, croquet balls, sponge balls, oranges, grapefruit, etc.

The janitor drops the objects from the roof of the school. The children first try to use stopwatches but it is hard to see exactly when the janitor drops and when they hit. Finally a "Galileo girl"[45] points out that you should drop objects of two different weights together and then listen to see if they hit at the same time (Fig. 11).

To look closer at what is going on, the children take a video and line up every 5th frame. They immediately exclaim "constant acceleration" because they all have remembered the visual pattern from several months earlier. To confirm, they

[45]We have found that in classes of 20–30 children there will almost always be a "Galileo child" who can see this good way to make a comparison (Aristotle's problem was that he wasn't a child, and didn't think to ask one!).

measure using the same translucent rectangles. Now, how to write a program that will *model* this movement? At some point several of the children realize that this is exactly the same situation as months before, but they have to do the movement by changing the "vertical property" ("y"). Some of the children leave dots behind that match to the video, some move a simulated ball to drop at the same rate as the video. They will "jiggle" the acceleration constant to match up to the video.

Why does this work so well with 5th graders, when the topic of "Galilean Gravity" is misunderstood by about 70 % of college students (including science majors)?[46] First, the kind of mathematics used here only uses iterated addition and is acted out on the screen. Second the children create and derive the model rather than having to parse out one that is given to them. (It is very likely that this approach would also make a big difference with the college students, who usually are subjected to being told what the relationships are in an abstract "for all time" form that uses both multiplication and exponentiation rather than in an exploratory concrete moment-to-moment incremental form that only requires addition.) Those familiar with mathematics and science will recognize that the math the children learned is "an intellectually honest" discrete version of the calculus (especially as Babbage saw it in regard to machine calculation), and the "intellectually honest" version of science uses a modern way to assign equal durations of time to observations of distance traveled that Galileo would have recognized and appreciated.[47]

The classroom process was similar to the New England music learning approach, in that the classroom teachers were able to meet the curriculum more than halfway, and there were visiting "experts" to help the teachers with both the science and the curriculum.

It's worth pointing out here that this perspective is very different from the "everyone should learn to code" fad in which we are currently immersed. "Coding" is primarily trying to use a few ideas found in programming languages. Here, at the center, are "powerful ideas" made more visible and understandable by creating them as systems that can be simulated. If "*the computer is an instrument whose music is ideas*" than the codes are just the "notes", the *ideas* are the larger representations that make the "music".

For example, consider the systems dynamics of an epidemic[48]: processes that most adults don't really understand. However, a 10 year old child can turn the car from the previous example into a "villager".

A copy can be made with similar behavior and colored blue. A little program can be written by the child to see if a blue car and a red car have collided, and if so to turn the blue car red. The child can pretend that a blue car is a healthy person, and an infected person is red (Fig. 12a).

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[46]Cf. Lillian C. McDermott and the Physics Education Group Univ. Washington: many papers over the years showing that science students are in a basic human "gulley" and almost none of standard physics presentations heed that gulley. For example, see: http://wolfweb.unr.edu/homepage/jcannon/ejse/mcdermott.html.

[47]See Drake (1975).

[48]Adapted from Kay (2013) Available online at: http://www.vpri.org/pdf/future_of_reading.pdf.

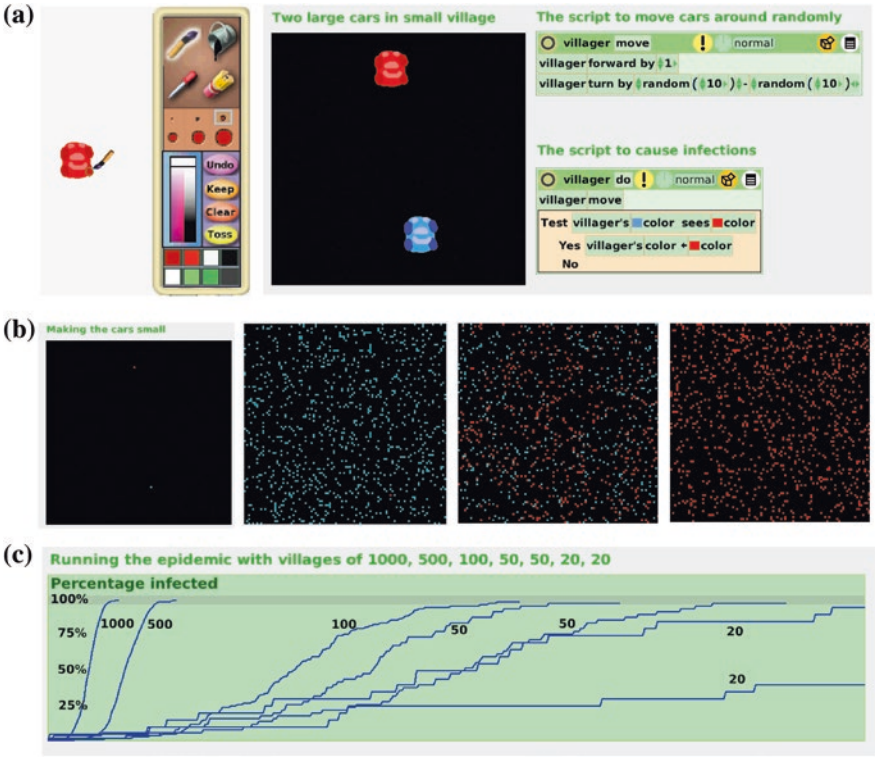

Fig. 12 **a** Making an epidemic simulation from scratch. Turning cars into "villagers" and writing programs to move and infect. **b** Making the cars small. Making a thousand uninfected villagers and one infected one. In the simulation all wind up infected. **c** Trying different size villages and population densities. All wind up being infected with a similar "S" dynamic

The child can make thousands of tiny blue cars and one red car, and set them loose to see the dynamics of an epidemic (Fig. 12b). The progress of infection over time can be displayed dynamically (Fig. 12c).

Different sized populations can be tried. The smaller the population the more sparse the "village", and the longer it will take for infections to happen. Children are fascinated by the variability of "luck" (note the two trials with 50 villagers: similar but not identical). Still, all the villagers perish. Fast infections are like typhoid. Very slow ones are like AIDS. They can see that everyone will notice typhoid, but AIDS might seem to be invisible until too late.

The child has made a *model*[49] that helps create insight into why it is critical to pay attention to non-curable infectious deadly diseases no matter what commonsense seems to conclude. Millions of humans in the world, perhaps billions, do not have these insights, and are dying because of it.

[49]These system examples were inspired by the work of Seymour Papert, Mitchel Resnick, and several decades of our own research.

The child can post this simulation on the web—in a YouTube like site for children's creations—and other children can download it, think about it, make changes, etc.

With their *model-making and re-checking*, the children have now acquired a very *distinct-from-story* way to depict, explain and think about complex happenings. We are genetically predisposed for language and stories. We had to invent our second way of thinking—logical reasoning—which is powerful but a double edged sword in that it only expands connections from things taken as "given" (and we have seen that so many of our "givens" are just fond beliefs). The third and most important thinking invention—science—uses reasoning to speculate, model, and suggest but requires rechecking with comparisons back in the world of phenomena. Science doesn't completely tame the dangers of Reasoning, but allows many of its powers to be used more safely.

Symbolic model-making is an extension of making real things from building materials such as "Tinker Toys". A Tinker Toy bridge is both a real bridge and a model of a bridge. Like the survey of India, its inner connections go beyond stories to systems relationships. The symbolic modeling techniques of modern science are analogous to these constructions.

Another important process—similar to the Music-as-an-Art-for-all program in New England—had the children introduced to *mathematics, science, and computing as creative arts*—with them as the artists-in-learning This took advantage of the artistic learning and making environment of the Open Magnet School[50] in Los Angeles, a school very much based on the ideas of Jerome Bruner.

"Art" is sometimes thought of as "soft", but this quite misses what it is all about. As Howard Gardner once pointed out: *an artist has a relentless urge to reveal deep truths about the world.*[51] This is as deep or deeper in the artists of the "Hidden Arts. And we were not surprised to find the children ready and eager for these new art forms.

We can see that much of the approach here is "a first course in Jerry"—heavily influenced by the general principles in his early books,[52] especially:

- multiple ways of knowing and learning: *enactive*, *iconic* (figurative), and *symbolic*[53]
- custom reinvention of adult knowledge to heed the level of development of children
- a carefully scaffolded environment in which real discovery can actually work
- prompting children to make analogies and "go beyond the information given"
- participating with the emotional depth that deep thinking always brings

[50]Itself a fine Work of Art by the Principal Roberta Blatt (previously one of the first wave of MACOS teachers), and the many fine teachers we worked with.

[51]Gardner (2012).

[52]For example, Jerry's influence on the invention and design of the now pervasive overlapping windows and icons GUI is partly chronicled in: Kay (1990).

[53]Also see Howard Gardner's extensive works on multiple ways of knowing and learning, and the many ways that Art pervades human existence and development.

We will not take this further here, but hope that readers are encouraged that these ways of learning the hiddens can be carried much further, especially with a computer to be the instrument to "play the simulations" created by the learners. Cesare Pavese said it well: "To know the world, one must construct it".

Finally, let me argue that a primary aim for learning any of these Arts—and especially with technologies that might help both learning and doing—is to *get better processes going in our own minds* rather than to create a composite human-plus-prosthetic—a kind of "cyborg"—for thinking. The latter worry is found in Socrates' complaint[54]—via Plato—that among other things, writing will harm people's memories and ability to memorize—nicely ironic considering that this complaint is delivered in written form! A positive way to interpret this is that Plato wants us to notice that, if we *decide to remember*, then writing is the greatest invention ever, because *it gives us so many more powerful ideas to remember and use internally*. This problem has been encountered in music learning as well: those who start music with instruments instead of singing, are far less likely to hear the notes internally when sight reading: they have externalized the production and sense of pitch to the machine.[55]

For an "art of the hidden" such as calculus, we would desire that our internal outlook on ideas and processes will now have a *calculus intuition* to help see what's going on—a "calculus brainlet". If we take the "System 1" and "System 2" metaphors as real enough to think about, then this calls not just for "System 2 to learn to think slowly and carefully in the world of calculus, but also for "System 1" to learn how to "think fast" in the world of calculus: this is one way to give meaning to the idea of *intuition.*

So, although we will certainly use tools/instruments—such as computers—that can do what our minds cannot, we still must not let our basic thinking be done by agencies outside our own minds. That caters far to much to our pre-dispositions for religion and beliefs. As Jerry urged in MACOS, we both have to find out what it means to be human *and* find out how to be more so.

This is also a deep need in a democratic society, where it is quite likely that specialists will be able to do certain kinds of thinking and actions better than the average citizen. Real trust comes from Jefferson's observation *"I know of no safe depository of the ultimate powers of the society but the people themselves; and if we think them not enlightened enough to exercise their control with a wholesome discretion, the remedy is not to take it from them but to inform their discretion by*

[54]Actually, in the *Phaedrus*, Socrates relates the complaint of the Egyptian Pharoah Thamus when presented with the invention of writing. Plato, *The Phaedrus*, (Oxford World's Classics), Oxford University Press (2009).

[55]Pianists have many more problems of this sort because the instrument doesn't require breath or change of bow, so there is nothing external to motivate phrasing, etc. There is no way to make a struck tone get louder etc. One remedy is to have piano students also learn a more expressive instrument (which ideally would include the human voice!).

education".[56] In other words, all the citizens need to be at least fluent in the main ideas and conversations of their society.

Because our passions are so much of who we are and who we can become, a humane solution is not to quash the passions but to give them new and uplifting contexts in which to express the richness and joys of living itself. We'll have the same old brain for quite a while, and more and more powers, but we can do a lot to help it learn not just better ways to think slowly, but much more important, to learn better ways to think fast.

In the deepest spirit of Jerome Bruner, we need to move "Towards A Theory of Instruction" not just in the "Arts of the Hidden" but especially in the "Arts of Art".

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[56]Thomas Jefferson to William C. Jarvis, Monticello (Sept. 28, 1820).

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Narrating Possibility

Colette Daiute

Introduction

Possibility is wrought of human intelligence and imagination, and, as Jerome Bruner has argued, narrative is a means of enacting possibility. Given the contemporary circumstances of violence and instability where millions of young people are growing up across the globe, those of us interested in human development must consider the meaning of "possibility" and how young people in challenging circumstances might be using narrative to imagine possibilities. Although narrating cannot change the circumstances of war, forced migration, child abuse, and other situations threatening human development, narrative and other symbolic media guide our perceptions, interpretations, and actions. There is, for example, evidence from previous research that, in certain circumstances, narrating one's negative and positive experiences holds promise for developing meaning, creating social connections, and strengthening responses to challenges. For this reason, our inquiry into narrating possibility raises questions about how young people growing up in the midst of dramatically changing and challenging circumstances narrate their experiences and intentions and how children and youth use narrative to interact with societal narratives, such as reform policies and institutional missions. This discussion also considers conceptual and methodological insights required for investigating narrative possibility, and the high stakes in supporting practice and inquiry into narrating possibility.

In this chapter, I discuss narrating as a process of possibility—imagining and enacting social change with this lifelike yet creative symbolic system. I define the foundational concept—relational narrating—as an everyday process that can,

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with support in practice, foster the development of individual-society interactions. I then discuss how relational narrating is embedded in everyday discourse, heightened during certain times of crisis and supported in certain kinds of narrating contexts. Consistent with the theme of this book, "cultivating possibilities," I argue that research with narrative should occur in the context of practices to support developmental uses of narrating so it can be a means of social change in circumstances that challenge child and youth development. This discussion begins with foundational definitions of narrative.

Narrative

Narrative is a mode of discourse reporting events in oral, written, and visual language. Discursive activities, like speaking, writing, choreographed movement, and certain kinds of visual expressions, not only express symbolic thinking but also form it and develop it (Parker 2015). Narrative appears to be universal, yet is developed in specific cultural contexts, and thus is complex and particular as well. Agreements about the major elements of narrative include time, plot, landscapes of action and consciousness (Bruner, 1986), and phases of referential and evaluative meaning (Labov and Waletzky 1967/1997). For example, narrators use myriad elements, including characters, settings, plots with events that set stories in motion (also referred to as "trouble"; Bruner 2003; Daiute 2011), high points or climaxes (Labov and Waletzky 1967/1997), resolutions, and morals as tools for sharing experience, feelings, and intentions.

In his study of civilization, Bruner has focused on narrative as a doubly oriented human process, enabled by culture but also constrained in culture. The communicative nature of narrating—*how* people express themselves—creates cultural meaning. People narrate in relation to surrounding contexts, playing some role in what they narrate, how they do that, and what they leave out. The recognition is that each narrative (like any utterance) interacts with other narratives, from broad histories to conversations in daily life to ways of knowing enacted in political documents, and personal stories (Bakhtin 1986; Best 2012). Disciplines focusing on narrative include sociolinguistics (Labov and Waletzky 1967/1997), developmental psychology (Vygotsky 1978), philosophy (Austin 1962), discourse theory (Fairclough 2010; Wortham 2001), literary theory (Best 2012), and narrative theory (Bamberg 2004; Daiute 2014; Nelson 1998).

This definition is concerned not only with narrative form but also with purpose and function—that is, the process of narrating. Narrating is, thus, a dynamic activity that individuals, especially those struggling with changing and challenging circumstances, such as migration, national citizenship conflicts, and access to education, use to mediate their experiences and might benefit from support in doing so.

Three narratives by a community college student in the United States provide an anchor for defining narrative. These narratives come from a study with students sharing experiences in community college—a rapidly changing institution in the United

States—and highlighted in a policy designed to help immigrant students (Daiute and Kreniske 2015). A student, Sofia, identifying as female, Hispanic, and immigrant shared these narratives. Although not written in perfect standard English nor literary style, Sofia's narratives are expressive and conform to a basic definition of narrative. They also illustrate more complex concepts discussed later in this chapter.

In this narrative of a difficult experience in college, Sofia recounts a series of past events.

> My most difficult experience was to get enrolled after have studied before outside the country. It took more than a year between the process of submit all the documents in the way the college wanted and for them to review it, even though I did not want those credits transferred

Elements of narrative structure in Sofia's narrative include ("was to get enrolled", "have studied before", "took more than…", "for them to review it"); psychological orientations of diverse participants in the events ("college wanted", "I did not want"), and an ending indicating her critical reflection on the narrated events ("more than a year," "all the documents" "in the way" "even though"). Sofia narrated that experience with various past tenses, clearly distancing from the experience in that way, as well as with the implication that her intentions were not taken into account.

In the following narrative of a best experience, Sofia is more succinct, while stating "possibility" explicitly, with one past event and temporal marker ("after have come to the country," "not long ago") and two present events ("to get to study," "be eligible").

> The possibility to get to study after have came to the country not long ago and be eligible to financial aid

In the next narrative, Sofia interprets the deferred action policy, which suspends deportation for young people aged 16 to 30 who came to the United States illegally when children. This policy affects not only many community college students, as a high percentage are immigrants, but also affects their U.S.-born peers who share the college experience.

> (President Obama made this deferred action policy) Because there are a lot of children of undocumented people who came here (to the United States) at a young age, but because of the migration status they were not able to attend college or have good jobs even though they lived here most of their lives and consider themselves Americans

Here, Sofia narrates a general migration process of "a lot of children" with certain histories "undocumented people who came here", problems "undocumented status," "unable to attend college," or "have good jobs," ironies "even though they lived here most of their lives" and subjectivities "consider themselves Americans". She used that narrating opportunity to expand to a broader American condition, what she had earlier shared as a personal experience. These different narrating positions—difficult experience, best experience, narrating policy—illustrate integrations of relations in narrative. The best experience narrative aligns with the institution that affords her possibility. The difficult experience narrative enacts the author's possibility to distance from bureaucracies, which appear not to take her seriously. And, the narrative including many other immigrants portrays solidarity.

Sofia's meanings across these narratives are embedded in temporal expression, a quality relevant to possibility. As I noted in introducing those narratives, time is a narrative quality that links with possibility and the human condition. Although Sofia, for example, is not a native speaker of English, she used temporal expressions to relate in different ways to the college experience, the institution, and other people. She used past tense to narrate difficulty, present tense to narrate a positive experience, and a mix of temporalities to narrate the social conditions facing millions of young people in the U.S. today. The interplay of narrative times within and across those and other narratives offers meaning, related to possibility, well beyond Sofia's explicit statement about possibility. For this reason, we consider temporality as, at least in part, an aspect of narrative opening possibilities.

Possibility and Narrative Time

The concept "narrating possibility" focuses our inquiry on temporality—the nature and consequences of time in narrative meaning. In the second decade of the 21st century, millions of children are born each day in the barest of circumstances, often in makeshift shelters or bereft of shelter altogether, with lack of full nourishment, socio-emotional nurturing, and activities for guided intellectual development (www.unhcr.org; www.unicef.org; www.crin.org). How might we put possibility to work to address issues of narrating in such situations? Given the increased incidence and visibility of inequalities and their relevance to life possibilities, we can inquire into human resourcefulness via symbolic media and activity. To do so, we must take seriously the possibility of narrating, and, thus, advance beyond defining this cultural invention in seemingly individual experience or historical terms of past, memory, and master-narrative. Our understanding must shift to an understanding of narrative in terms of critical and creative engagement of challenges—and possibilities—in daily life where intentions are salient and sentient. Because these inequalities are created in broader politicial-economic systems, we explore how individuals' narratives interact with those of institutions. In this case study of the community college, that means narratives by the colleges and the national policy.

According to some theories, including Bruner's, narrative is a genre for enacting possibilities, as narrating is not only about memories of the past but also a means of enacting the present and most interestingly, imagined, hypothetical events and understandings. People sometimes narrate possibilities they achieved in the past, but narrating is also a means for imagining what has never occurred and what will never occur. As an expressive medium rooted in the world and in activity but also employing symbolic devices, narrative is hypothetical thinking. Truth and fiction are entangled in the narratives that construct our daily lives, requiring not only factual reporting but interpreting and imagining.

Scholars have defined narrative in terms of time, such as with at least several past time phrases depicting events (Labov and Waletzky 1967/1997), the grounding of literary narrative in a three-fold present of author-story-aesthetic effect

(Ricoeur 1984), and the construction of narrative meaning as it resolves (Freeman 1998). Theory positing that people use narrating to figure out what is going on around them, how they fit (Nelson 1998), and what they want to change embeds past, present, and future time expressions at the time of telling (Daiute and Botero Gomez 2014; Daiute and Nelson 1997). Jerome Bruner's writing about possibility overlays these temporal dimensions of narrative with the role of narrative in hypothetical thinking, which can, ideally be hopeful. Time, moreover, integrates landscapes of action and landscapes of consciousness in narrative discourse (Bruner 1987). Just as tense and temporal markers organize narratives, narrative meanings emerge in relation to temporality—assumptions about purpose, values, and causality in extant social relations. Sofia's narrative about those who qualify for the deferred action policy, for example, addresses the context of immigration rights and responsibilities with a sense of history and values. While narrative discourse integrates diverse time frames (such as assumptions about causes and consequences of past events) with time markers (such as tense and words like "before") organizing the narrating process, possibility implies a future-oriented gaze. Given diversity in the contemporary human condition, how might every day narratives be temporal in a way that allows possibility?

This discussion of possibility and time benefits from recent scholarship in African American literature and post-colonial studies addressing what is at stake in reading time in histories and novels of slavery and other extreme inhumanities. Reading the temporal frame of narratives such as Toni Morrison's *Beloved* and drawing on literary theory about whether and how narrative deals with the past, Steven Best explains the importance of openness to possibility from the perspectives of those who were wronged in slavery. Because events and subjectivities are embedded in the present circumstances and time of slaves and others with whom "we crave connection" readings in our present cannot recover the past of those persons (Best 2012, 457). While a seemingly obvious possibility, as in some of Morrison's novels, the desire for freedom or redemption is unpredictable when posited today, and, thus not from the imaginations of those who knew the circumstances. Best, for example, explores the unrecoverable nature of past desires, to consider how circumstances of that time might persist into today.

An insight from a vast literature about inhumanity is that possibility occurs in the relational context of the lived present, rather than in a temporal line from past to future. Compared to experience, which is knowable only in its present, possibility is that which is not known, not by observers maybe not even by those who experience events. This lack of knowing constitutes lack of recovery. Faced with such foreclosed possibilities (for actual redemption), we have only our present conjuncture, only our current predicament. …" (Best 2012, 457). Narrative, like history, becomes less about reconstructing or correcting past events than about the relation among diverse narratives from diverse perspectives engaging with one another by interested persons in the present. How, then, might we enact possibility in the sense that Jerome Bruner (and others) described it, not only about a better future but also about people mustering their intelligence to deal with the human condition? If an ethical way to deal with the past is "to discern structural

inequalities repeated in the present" (Best 2012, 463), then this process could be narrating possibility.

When reading possibility in narratives of every day life, how do we participate with those whose possibilities we, as teachers, researchers, and activists crave to know, even across experiences of race, class, age, power, and so on? Following the logic that the past is unredeemable (Best 2012), we should neither emphasize past accounts as authentic nor possibilities as corrections of past wrongs. Instead, reflecting from diverse stances, with diverse purposes, and diverse others can offer insights about the range of issues or "constellations" (Benjamin 1969) of intentions around an issue, like immigrant rights, for example, as we read in Sofia's narratives above.

Narrating is, thus, temporally liminal—that is, not defined in terms of linear progression from past through the present to a future. Consistent with that view, possibility would not necessarily be narrated as progress but would emerge in salient narrative details indicating uncertainty, intrigue, upset, or other narrator concerns. What reductions or injustices do we commit by reading narratives by young people in challenging circumstances as though we know how to define what bothers them, such as post-traumatic stress, or what they imagine as ideal or dreaded possibilities, such as moving "beyond" war? As I noted in my research with the generation growing up during the 1990s wars across the former Yugoslavia, assumptions that the past and the war defined their present lives, such as when researchers assume responses like trauma or cycles of violence, can be oppressive (Daiute 2010). Can we, likewise, become oppressive in our assumptions about possibility, as desire to move on or to repair? What then are the relevant conditions for examining narrative possibility? How do we read possibility in narratives of students, research participants, our selves, our leaders, and collaborators? It is also worth asking whether narrative imaginings might be escapes from challenging life circumstances, playful engagements of experience, or effortful figuring out of alternative interpretations of experience and intentions.

This brief discussion of time has been, I hope, useful for loosening assumptions about any pre-determined nature of possibility as future, as positive, or as desired. Having explored the openness of time in possibility, I turn to another dimension of narrative—relationship—as relevant to possibility. Based on research in diverse communities in diverse circumstances, I propose a theory of dynamic narrating with the concept "relational narrating" to explain how children, adolescents, and adults use narrative discourse to interact in their environments.

Relational Narrating

Narrating is an activity people use to mediate—to manage—interactions that matter to them. Narrators recount experiences and tell stories to solve problems, to make friends, to pursue opportunities, to live good lives. This sense-making function involves using narrative as a tool to figure out what is going on in the environment,

how one fits, and how situations might be better. For these reasons, narrating is a process that occurs within a complex network of social structural, interpersonal, and environmental relations. As the basis for research design, the next section expands the definition of narrative, in particular as interacting in social systems.

"Narrative" becomes "narrating" when we realize it is a process. As a process, narrating involves the use of narratives for making sense of what is going on around one, how one fits, and what people may want to change. Any spoken, written, acted narrative, thus, embeds temporal, social, and situational relations. According to discourse theory, knowledge and identity are created in the context of culturally meaningful activities in verbal and nonverbal practices, as each linguistic utterance is a response in "the chain of communication" where "no utterance is the first to break the silence of the universe" (Bakhtin 1986, p. 69). Interaction occurs "when the listener perceives and understands the meaning (language meaning) of speech, [and] he simultaneously takes an active, responsive attitude toward it. He either agrees or disagrees with it (completely or partially)" (Bakhtin 1986, p. 68). As a social-relational activity, narrating is dynamic.

The interactive process of person-in-world has been identified in the narrative quality of "addressivity" (Bakhtin 1986). Addressivity is a quality of each meaningful utterance, a word, brief narrative, or novel, responding to others in the present, prior, or imagined moments. Whether in the room or in the imagination, those others have created some motivation for an utterance—a definition, explanation, or justification—and a basis for response or resistance. The insight for narrative inquiry is that writers and thinkers, like speakers, direct language to audiences distant or imagined, such as others who may judge, as well as to actual audiences in the immediate context. In this way, imagined others and present audiences become integrated in the narrative. Possibility is, then, also relation, rather than as a desire for a future that differs from the present or past.

Although the assumption is that narratives are oriented primarily to the past, to memories, the narrative process is rooted in the present to *do* something in the world, with past, future, and multiple temporalities interacting in persons' lived and intentional experiences. Similarly, although the assumption that narratives are primarily personal, each narrative embodies the author, purpose, audience, situation relations. It is infused with the speaker/writer/actor meanings of the event with those relations. Each narrative is infused with the telling situation, including the physical, social, and symbolic contexts. This interactive narrative process occurs as appropriate across diverse cultural contexts where people relate to present and imagined others, including individuals, communities, and institutions (schools, community organizations, workplaces, etc.), in social and physical environments. We understand the profoundly dynamic nature of narrating not only as a medium of communication but also in terms of the interactive qualities of narrative genres, such as the ways that narrative plots build to attract the attention of listeners and readers, build toward a turning point, and resolve events to make clear that the story has ended (Labov and Waletzky 1997). This theoretical insight is brought to life with principles explaining that narrating is a process of use—to do things in the world in relation to diverse other people and to physical and symbolic environments.

The principles of use, relation, materiality, and diversity guide the work of narrative in contexts of practice, research, and public engagement (Daiute 2014). The relation principle is that narrators interact with present and implied others, objects, and ideas in environments—that is in terms of different speaker/author-audience-issue relations. Narrating is a relationally complex process, because for each telling and listening arrangement, the author must consider which details to select, how to arrange them to highlight the most interesting points to maintain the listeners' attention, how to present him- or herself in the telling, how to avoid certain taboos, or how to suggest another life with the story. Recounting the same event at another time, in another place, or in another social arrangement would provoke some change in the meaning, because narratives embed audience, time, and place, implicitly as well as explicitly. For this reason, designs for research, reading, and practice should observe, elicit, and analyze the narratives participants share in relation to diverse circumstances. Whether participants mention issues like race, gender, or political persuasion is likely to be determined by the present and presumed listeners and readers of the narrative. What may loom large as an expectation or a taboo in an interview about voting preferences and ethnicity with a person of the same ethnic group is likely to differ from what looms large in an interview on the same issue with someone from another ethnic group. Likewise, what emerges in a narrative framed as one's own experiences with a certain difficult situation is likely to differ from what emerges in a narrative about another person's plight. Ignoring such relational complexity—variation of narrator stance and meaning—and any contradictions in favor of coherence could seriously limit the results of a study.

The materiality principle accounts for the fact that narrating is firmly rooted in actual life. The physical features, like exclamations (!) or repetitions, and the structural features, like prosaic openings (e.g., "Once upon a time") contribute to meaning, so we pay attention to those features in narrative analysis. For example, exclamations (among other detailed narrative features) indicate what is especially important to the narrator. Elements of plots, like openings, indicate the narrator's stance on narrated events. "Once upon a time," for example, indicates that the narrator wants us to judge her story as a comment on life from a distance rather than exactly as *her* life. We should, therefore, consider the concreteness of meaning in discursive acts and elements, such as whether the genre is autobiography or fiction and the specific features that go along with each, such as whether the referent of the "I" character is the author or an imagined other. Important messages may or may not be stated (often the most contentious ones are *not* explicit). Sofie, for example, used general categories to narrate injustices experienced by young immigrants, while phrasing positive experiences in more personal terms (Daiute 2014).

The diversity principle refers to differences within and across individuals and groups in narrators' stances—purposes, feelings, and thoughts—in relation to their audiences at the time of telling. This kind of diversity is like a network of connections rather than primarily inside the narrator or about narrator identity. Researchers often design their studies based on diversities between groups distinguished by categories like gender, ethnicity, and citizenship. Such factors

play a role in narrator experiences, but they do not completely define individual or group experiences or their tellings, as is explained with the diversity principle. Categories like gender and ethnicity, which are presumed to be within individuals, are disassembled and complicated when we imagine various situations from the perspectives of diverse others as well as from our own perspectives, including adversaries in a conflict, unfamiliar groups, or those of another age group. A shared narrative—or script—might emerge from an analysis of narratives by people who had an opportunity to tell several versions of a story. Given the complexity of contemporary life and human relations, assuming unitary experience based on predetermined factors may not, however, offer the kinds of personal nuance researchers, teachers, or interlocutors in daily life want from narratives. Narrating diversity does not mean giving up one's point of view or giving in to another point of view; rather, it involves acknowledging one's complexity and sensitivity to others.

Relational narrating occurs in narrative systems. When we shift from narrative to narrating, it becomes difficult, and rightly so, to speak in binary terms of master narratives and counter narratives. Instead, if narrating is an interactive process, multiple relations are enacted—among expressive social structures, groups, and individuals, with diversities within as well as across them. For example, understanding protests playing out in public via the media as well as across public spaces requires identifying relationships among participants in different roles, actual and virtual conversations across those participants, expressive media, and shifts in meaning as those interactions occur over time and space. When we understand meaning as emerging interactively in systems, notions of master narrative versus counter narrative and even authentic narrative dissolve. Statements such as "police protect public order during protests" and "protests decry repeated police murders of Black men and boys" are not absolute and change from ideologies to narratives in relation to surrounding circumstances, such as repeated police killings of unarmed Black men. Different strands of such meanings emerging in activities (like a protest) as expressed with words, movements, and assemblies (like "Black lives matter") combine in a media presentation with specific features for specific audiences (albeit massive if broadcast electronically) at a given time. Whether the meaning of such a collaborative enactment persists over time is an empirical question, and certainly some meanings persist longer than others, with fewer or more changes given the materialities of time, situation, resources, media, and so on.

Narrative Systems

The context of narrative is an ecology—a system of settings, institutions, physical environments, formal and informal social relations, and events. When hearing narratives in daily life or imagining a narrative relevant to a research project, a researcher or teacher, for example, would, thus, consider a broad set of relevant

relationships. The concept "activity meaning system" extends the idea that narrating is a social process to include relationships involved in meaning making and, in that process, temporally fluid meaning. Activity-meaning systems are lenses for understanding and practicing narrating as fluid in terms of time, interactors, and positions.

A narrative system to explore the meaning of the contemporary community college includes relevant participants in different spheres of activity and roles, along with expressions relevant to making sense of the community college. With the relational narrating theory, these are in virtual interaction with one another. I have presented several of Sofia's narratives and will expand this system with a narrative by the U.S. administration and with narratives of others at community colleges. Narrative analyses integrate across the system by identifying the shared and diverse organizing values. Each relevant stakeholder in a narrating system might for example express different descriptions and interpretations of the shared endeavor, as in our example here, the community college.

Narrative is more than a means of communicating about personal experience. Narrating is also a means of social relations and social change, in part with the interaction of diverse values that organize narrative meaning. Any single narrative may be organized in a way that conforms to a social norm, such as the value of gaining higher education. Based on peer group values, for example, someone sharing an experience at college might or might not mention having serious questions about the quality of education at the college. Narrating is also, however, more than a means of reproducing social values of the powers that be—whether those powers are peers or a government. For example, if a person's peer group shares different values about the college experience from those of the person's family, he or she might not include the detail about problems at school yet would include that detail when recounting stories with friends. Because people use narrating to figure out what is going on around them and what is stirring within them, values from diverse life contexts come into play when sharing experience in research. No matter how carefully controlled a narrative research design, values organize narratives, so the careful researcher must consider narrative values.

Values are "culturally-specific goals, ways of knowing, experiencing, and acting in response to environmental, cultural, economic, political, and social circumstances—a definition based in socio-cultural theory" (Daiute et al. 2003, p. 85). Values are principles that people live by. Values may be enduring moral codes, situational norms, or, more likely, flexible and changing over time, situation, and other factors. Unlike rules, values are believed, at least to some extent. Nevertheless, values are enacted flexibly in daily life. Because narrating is a dynamic process, any single narrator can adopt different values he or she has learned in diverse cultural contexts of daily life.

In increasing contexts across the globe, people are not living in places where their birth cultures dominate, thereby requiring that they learn multiple cultural values (Sassen 2008). Any young person growing up in a city, for example, learns a culture in the family, which may conform to ethnic and religious norms, a culture in school that conforms to national norms, and cultures related to participation

in activities of interest or generational orientation. In this way, people's values expand, and as narrators they can select among or intermingle values in relation to their diverse groups. Expressed in actual activities, like narrating, values guide narrators, their selection of details, such as characters, connections among causes and effects of events, and the point of a story" (Daiute 2014).

To enact a national narrative about the importance of higher education in immigration reform, we point to a relevant policy statement, which we also asked, Sofia and her peers to interpret. An excerpt of this policy, expresses the mission of easing some restrictions, such as deferring threat of exportation, to certain students attending college.

> Secretary of Homeland Security Janet Napolitano today announced that effective immediately, certain young people who were brought to the United States as young children, do not present a risk to national security or public safety, and meet several key criteria will be considered for relief from removal from the country or from entering into removal proceedings. Those who demonstrate that they meet these criteria" (such as those currently in school) will be eligible to received deferred action for a period of two years, subject to renewal, and will be eligible to apply for work authorization. (www.dhs.gov/news/2012/06/15)

This policy was an executive action by President Barack Obama after years of stalemate of legislative action on broader immigration reform. The deferred action policy addresses children brought to the U.S. without visas and/or overstaying visas, children who report living in the shadows and in fear of being deported. The Obama administration's proposed that those involved come out of the shadows, declare their positive participation in society, especially in education, which involves their ongoing development and contribution to society. Relevant young people viewed this proposal in different ways, thereby adding to the complex of the narrative system around immigration reform.

While the policy excerpt values supporting those who are in the U.S. consistent with deferred action criteria, another community college student identifying as female, Hispanic and U.S. born shared a narrative of a difficult experience in college. This student, self-named as "idk", expressed very different values from Sofia. Also as part of the urban community college system, idk's responses express mostly different values from the deferred action statement and from Sofia's. Along with narratives by 382 other students, these reflections expand a range of meaning making about the contemporary community college. Idk acknowledges that some immigrants come the U.S. for a better life and work hard, but her values include disconnecting from this effort for reasons of scant resources ("barely enough jobs and benefits for people who are from this country" and "schools (and neighborhoods) are already crowded".

> I honestly think that it should just had stoof they way it was. I understand that immigrants do come to this country foR a better life and do work hard. (some of them). But there are barely enough jobs and benefits for the people who are from this country. Schools are already crowded and so are neigborhoods idk but i think its best for things to stay the way they are.

Idk's personal experience narratives echo a very small portion of the participants in our study and differ drammatically from the one by Sofia. Another important local meaning-maker is the college as expressed, for example, in mission statements like the following.

The following mission statement on a community college website marks the place of the institution in a complex narrative system. Whether and how different community colleges express their purpose in the same way is, of course, a question for further inquiry. All the same, this specific statement occurs in the ecology where faculty and students interact.

> … Community College's students are increasingly diverse and non-traditional in nature. They enter with significant impediments to academic success. They are more likely to be older, educationally and economically disadvantaged, have experienced academic failure at another post-secondary institution, have a significant commute to and from school, have frequently not gone directly from high school to college, are un-or under-employed, and are caring for children and/or aged parents.

The value of diversity is enacted in the community college mission statement, albeit in terms of categories ("non-traditional" "failure" "un- or under-employed" and so on) rather than in personal terms. Students are likely at some point to read this description. Administrators and faculty may also echo the values of diversity, thereby creating a ripple effect of those meanings, if not expressing them exactly. Sofia and idk both narrate issues of diversity, albeit in very different ways from each other and from the college mission statement.

Faculty, like administrators, are numerous and diverse in orientation to the meaning of the college, their role, and more. The following is but one expression by a faculty member, and research can sample many more for a focus on the instructional role in the narrating system (Daiute 2014; Daiute et al. 2013; Daiute and Kreniske 2015). This excerpt echoes the mission statement by highlighting the inability of community college students.

> … To create a world of young people skilled at analysis you first need to create a world of young people receptive to complexity, and many of Dr. X's students, he said, "cringe at complexity." … "Their experiences in the education system have been coercive. It's not really clear to them what the value of academic knowledge actually is. If they come here with the goal of doing something very specific—to become a stewardess, or a makeup artist—they may think, 'What's the point?' … He gave students an assignment on the work of the psychologist Edward C. Tolman, a pioneer in the concept of latent learning. [He] gave students a graph with two curves that corresponded to the conditions in Mr. Tolman's famous experiments with rats, which showed that they learned to navigate mazes even when they were not rewarded. Despite the evidence that learning could occur in the absence of external incentives, many students looked at the data in front of them and determined precisely the opposite. 'They could not contrast the curves and generalize what they meant in context,' … 'What it suggests, is that data contradicts their assumptions and confuses them. Often learning requires changing one's position toward some issue and they resist this.' (reported in the New York Times, 12/14)

A certain kind of inability, although not exactly those noted by the professor, is indicated in the writing skills both Sofia and idk, yet there are other elements—possibilities—that do not emerge in the professor's reflection. Of course, it is not

an exhaustive reflection of teaching and students, but negative values register. Idk's comments are somewhat similar in tone to those of the college mission statement and to the faculty member who focuses on deficits rather than potential.

> The accent of most of my proffesors makes it difficult to communicate. I think that proffesors should be able to speak "good" english if their going to teach a primarily english speaking class. Me not being able to understand them, i feel just puts setback while im in class.

On the other hand, idk's narrative of a best experience in college was more similar to that by her peer, Sofia.

> My best experience in college so far is the hours that my class strats Being able to strat class at one in the afternoon is somthing i really found out works for me. Im not tired i am able to stay more focus. I never liked having to wake up early in high school. College is just so free.

In the previous discussion, I have defined and offered brief illustrations of narrating as a system of interactive meanings. Understanding narrating as a process of communication in relation to diverse social and temporal relations provides a foundation for narrating possibility. The examples of narratives by different participants in meaning making about the community college system—a national policy, a college mission statement, a faculty member, and two students writing from different perspectives in the college (aligning with the college in narratives of best experiences and distancing in narratives of worst experiences), we can learn about diverse meanings across the system. Identifying the values organizing these narratives, we learn about what is shared and not across these participants. The discussion above is not exhaustive (for full analyses see Daiute and Kreniske 2015 and Daiute et al., forthcoming). Nevertheless, the illustration here indicates that there is some consensus about the meaning of community college in that urban setting (that participation by students from diverse backgrounds is important), and that other meanings differ (that the participation by immigrant students may or may not be valued). Because of possible pressure on students in a research or practice setting, we sampled a relatively broad range of narratives to enhance the expressive range.

Toward that end, supporting possibilities that are positive from the perspectives of individuals and groups with much at stake in their situations, supporting who might be disadvantaged within a narrative system is important. We extend these insights about the interactive nature of narrative to consider how narrating might involve social change, through imagining possibilities.

Cultivating Possibility with Narrating Systems

Cultivating possibilities with narrating means acknowledging the active relational stance of a speaker and writer with each narrative. Those of us who participate in practices like education, community development, and research can acknowledge

that each narrative enacts relationships—not only an individual memory or imagined experience but also a narrative speaker or writer's purpose and audience in that telling.

If narrating mediates diverse interlocutors and interactions, scholars can expand practice and inquiry by learning more about the dynamic narrating process. Beyond theory, we can learn about how individuals adopt and transform shared narratives. Scholars have identified cultural narratives as dominant discourses, master narratives, hegemonic discourses, and so on, while characterizing individuals as resisting or adopting these. Examining interactions across participants' expressions in activity-meaning system designs, we have noticed more power and nuance in the interaction process. Much is at stake in expanding our understanding of the individual-societal interaction, which Vygotsky, Bruner, and others today have claimed characterizes human development. In the increasingly poly-cultural societies today, we can examine how individuals interact with cultural scripts that circulate in the various spheres of their experiences—virtually and physically. We can ask, for example, how young people newly involved in social movements enact their values.

Ironically, much research tries to limit the relational dimension, in part because it creates dissonance and in part because the emphasis is typically on conformity and truth. Survey research, for example, minimizes participants' language production. And, as discussed above, research with narrative often emphasizes coherence. Those may be important goals over the life course, but to achieve a coherent sense of self, individuals go though the process of dealing with conflict, tension, and contradiction. Those dynamics are embedded in the narrative process, albeit often unexpressed in favor of a good story or the right story—so research designs must allow the expression of multiple stories relevant to the inquiry.

What we learn from sampling narrative systems to consider the cultural nature of meaning and possibility in narrative is much like what Walter Benjamin referred to as constellations. " 'It is not … that what is past casts its light on what is present, or what is present its light on what is past; rather … what has been comes together with the now to form a constellation' " (Benjamin, The Arcades Project). We can, thus, do justice to those we hope to understand in order to create better pedagogy, developmental theory, or simply better understanding, if we read closely and relationally across narratives to observe what is salient, what is missing, what is sought after repeatedly and between the narratives. We should seek a constellation of meanings in social relation and, therein, is the possibility of human connection sought and human connection possibly achieved.

Returning to the issue of inequality—when we define, sample, and support constellations of narratives—narratives in relational systems of meaning making—the perspectives of different stakeholders become obvious. In the brief examples I presented here, participants in the community college systems across New York City might be defined as "low income" colleges and people, "first generation college students", "minority students", or as they define themselves "born in the United States", "studied before outside the country", "did not want", "consider themselves Americans", and so on.

As I have indicated in this brief analysis Sofia expressed some values quite similar to those by the Presidential policy, and some different values across her various narratives. In contrast, idk, also taking advantage of a low-cost college in a time of big debt (another narrative system occurs around that!), narrates values quite different from those expressed in the deferred action policy, by Sofia, and by President Obama. Such diverse perspectives on diverse realities in contemporary life require us to consider social and political dimensions of "possibility" with a goal of enhancing possibility where it is most challenged.

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Bruner's Ways of Knowing. From the Cognitive Revolution to the Digital Revolution: Challenges for the Schools and Teachers of Today

Britt-Mari Barth

We are living through a period of enormous cultural and social change which puts great pressure on schools and teachers. Expectations for schools have never been greater and at the same time the capacity of schools to satisfy them is put in doubt. In order to meet the new challenges arising in the "knowledge society", schools are asked to reinvent themselves. The digital revolution is proposed as an agent of change to transform schooling. But under what conditions?

The Cognitive Revolution

Since the late nineteen fifties, a cognitive revolution has been under way which has changed our view of the learning process (Barth 1995a, b). This new "science of the mind" has not, however, had a great deal of influence on pedagogical practice. It began with a change in perspective: instead of studying observable behavior, — the object of *behaviorism*—psychologists turned to the question of how the *mind* functions. The early efforts led to the conception of learning as processing of information, in the way a computer does. This was the first cognitive revolution. For a number of psychologists, however, and particularly for Jerome Bruner (Barth and Bruner 1998), that was a reduction of the understanding of the mind. It was necessary instead to try to understand, in association with other human sciences, the way in which one constructs *meaning*, and the means by which the mind takes shape through history and culture. "Acts of meaning" (Bruner 1990) introduced the second wave of this revolution, emphasizing *"the nature and cultural shaping of meaning-making and the central place it plays in human action"* (Bruner 1990, p. xii).

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Continuing in the tradition begun by Dewey (1933, 1938) and Vygotsky(1962, 1978, 1987),[1] Jerome Bruner is the leading theorist of the cultural orientation of cognitive psychology. According to Bruner, *"it is man's participation in culture, and the realization of his mental powers through culture that make it impossible to construct a human psychology on the basis of the individual alone"* (Bruner 1990, p. 12). Culture thus becomes a "tool-kit", which serves as a support to the making of meaning from reality. These tools may be intellectual, material, or symbolic, *language* being the most important one. Culture, in this largest sense, has thus a constitutive and structuring role in the development of human cognition. The way children learn every day at school forms an integral part of their culture and of their development. Rather than seeing learning as an individual processing of information, this approach emphasizes the importance of *social and cultural mediation* in the process of teaching-learning, for "culture shapes the mind", as Jerome Bruner reminds us.

"Our culturally adapted way of life" (of which learning is part) "*depends upon shared meanings and shared concepts and depends as well upon shared modes of discourse for negotiating differences in meaning and interpretations*" (Bruner 1990, p. 13). Bruner argues that *"it is culture and the search for meaning that is the shaping hand, biology that is the constraint, and, that, as we have seen, culture even has it in its power to loosen that constraint"* (1990, p. 23). One function of education, then, is to equip human beings with the needed symbolic systems. As Bruner states "(…)'*thinking about thinking' has to be a principal ingredient of any empowering practice of education"* (1996, p. 19). In fact "(…)*one of the most crucial ways in which a culture provides an intellectual growth is through dialogue between the more experienced and the less experienced, providing a means for the internalization of dialogue in thought. The courtesy of conversation may be the ingredient in the courtesy of teaching*" (1971, p. 107).

This "nutshell" synthesis has emerged from a long pedagogical journey. My first encounter with Bruner—when searching for a theory that could help to engage children in the classroom—came with the discovery, at first, of "A Study of Thinking" (Bruner 1956). This was in the late 1970's, in France. As an educator of Swedish origin, I had been observing children in the classroom and was struck by the fact that they did not seem engaged in learning. They memorized the right answers without knowing if and why they were right or wrong, often feeling insecure. They did not seem to know what it meant to know, nor how you could tell when you knew. The common assessment, a mark from 0 to 20, did not show the state of the learning. These matters were not something talked about at school.

Bruner theorized that you could conceive of learning as an interactive process of *conceptualizatio*n, making inferences and testing hypothesis in order to better explore the meaning of a phenomenon or an idea. Involving children in these processes, while cultivating the habits to give reasons and explanations, inspired an exciting vision of what the classroom could turn into! "*Knowing is a process, not*

[1]See also Barth (2001).

a product" (1966b, p.72)! Bruner's question of how an individual makes meaning out of a complex world—including learning at school—became my question, too.

While experimenting thinking in the classroom, new problems arose and in parallel I caught up with former books and followed the new ones to come (Bruner 1960, 1966a, b, 1971, 1973, 1983a, b), integrating the ideas I felt close to my own and getting a deeper understanding of their theoretical underpinning. In "Child's Talk", the concepts of "intersubjectivity" and "formats", permitting the child to engage in the conversation, having a participating role to play in a "joint action", were most helpful in grasping the "scaffolding" role of the adult. The "joint attention" serves as a frame for understanding the *context* in which the conversation takes place. This is something often missing in the school situation when children don't understand what they are doing.

This framework was immensely fruitful in thinking through the social and semiotic interactions at school. It invites the teacher to reconceptualize her role, her conception of knowledge, and the way in which she supports and enables pupils so they can make sense of what they learn in school—and of their school experience.

Pedagogical Implications

As a teacher and scholar, I have been immersed in this theoretical framework since my first explorations in the classroom, and I have tried to give shape to these principles in a particular *pedagogical approach.* (Barth 1987, 1993, 2001, 2013) which emphasizes the *co-construction of meaning* and a *socio-cognitive mediation of learning*.

The teacher thus becomes a *mediator* between the pupil and knowledge, the one who organizes "encounters" with the knowledge-in-action, where the context gives it meaning. For that, the teacher must know how to render abstract school knowledge *accessible* by transforming it into learning *situations* in which the pupils can *participate.* These "situation-examples" place the abstract knowledge in a particular context which permit the pupils to have a personal *experience* of it, which then also involves the affective side of cognition. How is one object or idea like another? In search for comparable traits, a first working hypothesis can emerge as a tool. This collective experience in the classroom thus brings about a "joint attention" which makes possible a common reflection in a group, even a larger one.

The teacher can then elicit the interpretations of each and everyone, initiate exchanges, and encourage debate, in particular among sub-groups. Listening to the pupils allows her to assess what they understand so she can pick up the discussion here and there as seems useful. In this way, she can guide their reflection, introduce them to the use of "thinking tools" (like *comparisons, analogies, inferences, and hypotheses…*) to "go beyond the *information given*" (Bruner 1973).

She thus engages them in an activity which in reality is a process of co-construction of meaning. The pupils learn to *direct their attention*, to *say* what they can observe, and to *listen* to others to deepen their understanding through the diversity of responses. They learn to *justify* their responses and defend them, and to *evaluate* their pertinence against the situation-examples, which represent the content—all of which demands a coherence in their statements. Most important, they learn how to *participate in a dialogue*, contributing with their own observations, while developing their understanding further, thanks to interactions—interactions with others, but also with the knowledge itself, in the form of situations or examples, made available to them by the teacher.[2]

An Experimented Class-Room Scenario

Let me illustrate this process by a middle school class-room example in history:

The pupils begin to understand what the phenomenon *"migration"* means, through the study of the Indo-Europeans, by means of a guided reflection of selected documents/examples. After analysis and reorganization of the observations, the first, more general, level of definition can be constructed with the pupils:

Change of location on a rather large scale

- in a certain manner
- in any length of time
- with varying rhythms
- from the place of origin
- to one or several destinations
- which can be explained by various causes
- preserving certain ties to their origin.

This "definition" can then be mobilized again and transferred to discover and explore, for example, the migration of the Greeks during the VIIIth—the VIIth century B.C., and also the Germanic migrations in the Vth century of our era as well as the Crusades during the Middle Ages. The first definition is not meant to over-simplify the meaning, but, on the contrary, to serve as a first tool, which enables the students to use it and then, gradually, enrich their understanding, through comparing different migrations. They can analyze them, make new connections of what they can recognize as being equivalent, if not the same, and then, restructure the definition again, making it more detailed, more precise.

The teacher's mediation is constantly available, whenever needed, as a human resource, with frequent feed-back as well as through the procedure itself and

[2]These situation/examples may take different forms depending on the context: a picture, a document, a video, a model, an analogy, a metaphor, a narrative, an observation, a museum visit, an experiment etc.

the choice of documents, but the pupils are doing the main part of the thinking, including the weaker ones. As the working strategy becomes familiar, they can collaborate in small mixed groups, and work together like in a research team. Gradually they learn to proceed more independently. Now, the modified, more complex, definition can be used as a grid to find out which movements of population can be interpreted as migrations, as compared to colonizations, war conquests or pilgrim conquests. By using the insights in more and more complex activities and questions, the pupils develop their understanding further and more deeply. The learning goes on through the activity itself. The process can actually go on all one's life in an ever growing Brunerian spiral! But it has to start somewhere, with some basic tools to get into the "field"! Salomon's and Perkins' theory (1991) of *distributed intelligence* fits in well here, the kind of intelligence which is not only in persons' heads, but which depends as much on artifacts, and on symbol systems that support our thinking. This is what the school should provide. In this example (Jadoulle et al. 2004), the learning can go on with more complex activities, like using the new insights to formulate relevant questions, to compare historical migrations with what is happening today, to select the most important facts, to study the effects of present migrations and to evaluate the arguments of today's interpretations, knowing there can be different perspectives.

In this process of mastering an organizing concept in a specific subject matter, the pupils also become acquainted, over time, with a procedure that guides them to be more proficient in distinguishing what it is that they are exploring, to get deeper and deeper into the heart of meaning. Gradually, the procedure itself can become a resource—a powerful thinking tool—to advance their understanding in other domains of knowledge, for example in literature genres. What are the differences between a satire, a blasphemy and a caricature? In Clifford Geertz' perspective (Geertz 1973), every discipline can be seen as a culture of its own and in order to enter it, to participate in it, perhaps even to contribute to it, one needs to recognize and understand its questions, its perspectives, its schemes of interpretation, its organizing concepts.

The pupils in this experiment were fully involved in the intellectual work and expressed satisfaction with it. They clearly enjoyed it. The teacher was satisfied with the depth of analysis they demonstrated: the concept had become a useful tool, a lens, ready to use in new situations.

To learn becomes learning to use a whole collection of cultural tools, that is, modes of thought, procedures, and key concepts in each subject. To teach is first to identify the common *tools of analysis* which the pupils will need for the new learning; it is to create *intersubjectivity* to ensure that mutual expectations are well understood; it is to *design scenarios* which, thanks to the back and forth exchanges between dialogue and concrete situations, allow pupils to *negociate meaning* and thus to *contribute* to the evolution of the teaching-learning process, taking some *responsibility* for their own learning.

The problem in most school learning is that pupils seldom have the opportunity to develop the power of abstraction themselves although, paradoxically, it would make their learning more concrete! School, in David Olson's words, is "a world

on paper" (Olson 1994), and the difficulty for the pupils is to make connections between symbol systems and their personal experience of them—if at all they have such an experience. But whose difficulty is it really?

Our conception of learning as being individual is thus changing. The learner is not a container to be filled, nor a sponge which absorbs. He learns in interaction, interaction with others, but equally—and that is just as important—with the supports of all kinds which he finds in his environment. This poses the question of knowing which environment we offer to learners as supports for the construction of their knowledge—with whom and with what are our pupils going to think?

The Digital Revolution

It is here that the digital revolution makes its appearance, borne by the multimedia culture, a world of hyper-information but also of misinformation and manipulated information. Pupils are imbued with this new cyberculture. They no longer come to school or to university with the same expectations—and that can no longer be ignored. There is a new relationship to authority, to knowledge, and to learning; pupils and teachers have access to the same information. Faced with this new situation, some authors proclaim "the end of school". The experiment of Sugata Mitra (Mitra et al. 2005) of the "hole in the wall" intrigues us as well.[3]

How can the cognitive revolution guide this digital revolution? How can we place these new resources in the service of the learning process? How can we reorganize roles? How can we take diversity into account? I will mention three perspectives.

Enrichment of the Supports and of the Environment of Learning

First, digital technology permits us to enrich the environment of learning. To construct the meaning of an abstract idea, of a concept, pupils need concrete supports. They need to make the constant going back-and-forth between "knowledge-in-action", the situation-examples, and abstract words (or other symbols), their explanation. To have three-dimensional images in order to understand the function of a cell, for example, or to watch a play in which there is the scene you were studying in class, or to have a virtual tour of an ancient site in order to understand history better …these are "experiences" which are facilitated by digital means.

[3]Sugata Mitra's Hole in the Wall project (2005) showed that children could teach themselves, and each other, how to use technology. It has has since gone on to become a significant project, referred to as Minimally invasive education (MIE).

As Edgar Morin, the French philosopher, reminds us (1999) the abstract knowledge is necessary, but it is mutilated without a concrete knowledge. The challenge for the teacher-mediator is thus to invent or have access to "concrete knowledge" which allows pupils to familiarize themselves with different ways of expressing the same abstract knowledge, in order to understand its significance and imagine its possible transfer to other situations.

The *variety* of illustrations made possible by digital technology can provide a fresh look, permitting a greater number of pupils to get a deeper understanding of what they learn. Having interesting experiences in order to better understand, will make for more cognitive involvement. Using contrasts will help to direct attention to what is essential. The sense of pleasure comes from the pleasure of meaning—of shared meaning. The different illustrations or situations proposed invite all students to participate in a dialogue in which diversity becomes an advantage rather than a problem. It is in this dynamic of relational interaction that knowledge is constructed.

This kind of learning is an act of consciousness and not only the processing of information. It is about engaged reflection and intentionality, about interaction and argumentation, about imagination and creativity to explore the unknown, but also about stretching the mind to the utmost just to comprehend what is there. In Mihaly Csikszentmihalyi's (1990) words, intention, cognition and emotion cannot be separated.

However, the goal is to arrive at a valid meaning of the object of the learning. It is important for the teacher, beforehand, to clearly define and make transparent the ways the pupils are expected to demonstrate what they have learnt, a condition to propose relevant learning situations. The assessment can also be differentiated. Once you agree on the intended transfer, there are many ways of demonstrating understanding.

Through the creation of networks of exchange—facilitated by the Internet—teachers will be able to share their ideas and resource links, creating a community of practitioners, thus reinforcing collaborative structures and allowing the community to extend in wider circles of expertise. This is all to the benefit of their pupils.

Facilitation of Interactions and of Collaborative Work

Digital tools (graphics, video, numerous applications…) facilitate personal contributions within a themed class project. By allowing each one the possibility of creating a personal "oeuvre" (Meyerson 1992) in the context of a collective project, we create at the same time a "community of learners" (Brown and Campione 1994). This allows pupils to engage in independent and group work of a topic of inquiry, then to share their expertise of some designated subset of the inquiry (for which they are responsible). Each pupil should have a specific role, both to inquire and to share, so that all participants in the group have access to the whole topic. The procedure favors both learning of meaningful content and the creative

process, which takes account of the diversity of students' contributions (Gardner 1983), and brings about mutual enrichment and the feeling of competence.[4] Another example of collaborative work is a "Twitter" competition in Quebec, designed for the need of both native and second language learners to become more efficient and reflexive in using the French language. This challenging invitation inspired 7000 pupils (in groups, or even a whole class) to take part in a contest of "creating sentences" according to progressively more difficult criteria, depending on the age of the participants (ages 7–17). A "twitterature" began to flourish through these exchanges, as did "twictees" (mini-dictations in 140 characters which are created, exchanged, and corrected by "twittclass networks" taking turns). All this motivated pupils to engage in the habit of observing language as a material to which one has access, which one can modify, correct, and improve. These efforts left space for reflection, for *metacognition*, for becoming aware of what you are thinking about. The constraint is a fruitful way to inspire commitment. This could, of course, be done without Twitter, but the interactive process it offers in addition makes it more attractive and serves well in keeping up the pupils' efforts.

To carry out grammatical or literary analysis in class, a digital interactive board is advantageous. As on a computer screen, one can work with the text to comment, underline, highlight, circle, etc. in order to emphasize the desired elements. Each one can interact (with a laptop if available) both with the text and with others. Pupils learn together how to *analyze* a text. It is the intellectual capacity of analyzing which is at stake, here applied to literature. The teacher can follow the observations of the pupils and help them to direct their attention to certain points (the structure of a certain "genre" for example). She can model efficient strategies, thinking out loud with them. It is easy to visualize links, to structure the whole, which aids memorization, not only of the content, but of the activity itself. With the aid of a screenshot, each one can keep a printed record of the procedure, which a traditional blackboard or other support does not permit. These are beneficial opportunities to study language and literature in depth, essential in a cultural perspective (Bruner 1986).

Facilitation of Personalization/Individualization of the Path to Learning

Finally, thanks to digital technology, it is possible to *vary* and to *personalize* individual paths to learning according to identified needs. In the same class hour, one can choose differentiated activities, propose tutoring of weaker students by stronger ones, group pupils with similar difficulties to work with the teacher, undertake formative evaluation (in the form of self-corrected exercises). For all

[4]See also Barth and Gardner (1998).

these activities aiming at conceptual change or deepening understanding, digital technology can offer the teacher resources for presenting content or exercises *differently*, to give the pupils *time* to deepen their understanding *at their own speed*. Different on-line learning activities might be a useful complement for some pupils for specific purposes. The important thing is to choose resources according to the individual needs and the goal which has been agreed upon.

One can also leave a certain choice of resources up to the pupils, making them more conscious of the use of digital resources, and thus more responsible. This can be achieved through a collective class project, a research project, for example. By participating more actively in such activities, guided by the teacher, they will learn to ask pertinent questions and to locate, sort, contextualize, validate, and structure the information found, in order to respond. At the heart of these different activities lie the very processes of learning themselves. Above all, to learn is to learn to reflect, to discern. To learn to link conceptual knowledge to experience. To learn to see the difference between what one thinks with, and what one is thinking about. But without this metacognitive mediation by the teacher, the ability to organize and articulate knowledge will not be assimilated by pupils and they will not be able to benefit from free access to information. School is thus more necessary than ever to learn how to construct and to transfer knowledge!

What Perspectives for Tomorrow? An Ethical Aim

What we have learned from the cognitive revolution can thus help us to better apprehend the digital revolution, to realize that enlightened and critical use of it determines the value. The cultural psychology of Jerome Bruner provides a framework for thinking about pedagogy in the era of multimedia.

Education is part of culture. The way one conceives of the "culture of education", then, becomes an important matter. *"The chief subject matter of school, viewed culturally, is school itself. That is how most students experience it, and it determines what meaning they make of it"* (Bruner 1996, p. 28).

When we talk about meaning, it is not only the meaning of subject matters, but also the meaning of the school experience itself. When pupils "have a place" in school, when they are enabled to participate, even to contribute to the learning, when they are treated as someone who has a "voice" worth listening to, they become engaged in the process of learning. Getting into ideas can be an exciting thing to do. When I hear the children say "could we make ourselves another concept today" or "if that is the way it works, we could help the teacher!", I know we are on the right path of getting them involved in the pleasure of thinking and knowing.

Albert Einstein, like Jerome Bruner an "eternal student" ("der evige Student"), put it well: "Never regard study as a duty but as an enviable opportunity to learn to know the liberating influence of beauty in the realm of the spirit for your own personal joy and to the profit of the community to which your later works belong".

Cultural psychology is attentive to how people learn, interact, to *"create a form of mutual attention, a harmony or 'intersubjectivity'"* (Bruner 1983a, p. 27). It can also be defined as *"how people come to know what others have in mind and how they adjust accordingly"* (Bruner 1996, p. 161). I believe this goal of creating "joint attention", of being attentive to that which engages our pupils today should help us understand how we can best use the new digital tools in the service of their life long learning. It should also lead us to think of assessment in a different way.

In an intercultural perspective, with the ever growing diversity of our pupils, of their paths of learning, of their projects, and in view of the diversity of the needs of our societies, the importance is no more to assess the learning of an identical "content". The idea is rather to use these contents as a means to develop the capacity and the desire for life long learning (supported by solid knowledge). This way of viewing assessment makes the pupils look forward to demonstrating what they know instead of fearing to be judged on what they don't know. This view is consistent with an acceptance of different cultures, it is based upon it.[5]

If the school experience, as a whole, engages the children from early age on, they can discover their strengths, develop their interest for this or that discipline, construct their motivation and perseverance, be confident in their own abilities. They can develop more control of their own mental activity—that is what "agency" is about. Such a school experience would naturally give meaning to their studies because it touches their very existence and makes them aware not only of their growing knowledge but also of their growing sense of identity. For the teacher, the challenge is to look in a new way at knowledge which is being constructed, and at pupils who are learning, and to reconceptualize her role, which has become more complex: from the teacher-transmitter, she becomes the teacher-mediator. Authority, then, is understood in its etymological Latin sense—*auctoritas*: to enable growth. It is in offering her pupils the means to learn that she enables them to grow.

This is Bruner's ways of knowing. And the way I learnt it was to have the privilege of having him as a mentor and a friend, over the decades. The manner in which he inspired discussion and listened to arguments, asked pertinent questions, showed interest, made you feel like a valid interlocutor … has been a living example to me and a life long learning experience. The courtesy of conversation may indeed be the ingredient in the courtesy of teaching.

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[5]This form of individualized evaluation has been experimented for a period of five years at the Master level, by means of a personalized "processfolio", which permits to follow the learning process as it unfolds along with the learning activities. See also, Barth (2012).

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Jerome Bruner at the Helm: Charting a New Course in Cultural Psychology Through Narrative

Noelle A. Paufler and Audrey Amrein-Beardsley

I think the most important general influence has been to get away from the idea that behavior is somehow to be chopped out of its context. It always has to be looked at contextually. What forms context? It's culture. That is why I say to be an adequate human being, to some extent, you have to be a little bit of an anthropologist.

—Jerome Bruner, 2011, *Inside the Academy* Interview

The personal and professional journey of Dr. Jerome "Jerry" Bruner, an exemplary scholar in the field of educational psychology, has been digitally archived through *Inside the Academy*, a free online repository sponsored by Mary Lou Fulton Teachers College at Arizona State University. *Inside the Academy* features enlightening and often entertaining interviews with America's most distinguished and influential educational researchers, most of whom are members of the National Academy of Education. Through each honoree's personal webpage, viewers can explore customized photo gallery collections, read candid reflections from family and friends, and access supplementary materials for further reading. Intended to serve as a resource to students, teachers, and the general public, *Inside the Academy* offers viewers a unique opportunity to meet Dr. Bruner and share in his passion for education. Please join us to get a glimpse into the life behind one of the finest psychologists and scholars in the academy: Dr. Jerome Bruner. To view a brief, two-minute overview of the *Inside the Academy* interview with Jerome Bruner, please see: https://www.youtube.com/watch?v=KtQJeWJr5UE. To view the complete *Inside the Academy* interview; his photo gallery; and reflections from family and friends, please see: http://insidetheacademy.asu.edu/jerome-jerry-bruner (Amrein-Beardsley 2011).

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Highly regarded as a distinguished psychologist, researcher, and scholar, Dr. Jerome "Jerry" Bruner has had a profound influence on the field of psychology transcending two centuries. Unbeknownst to many, he has also honed his skills, literally and proverbially, as a seasoned sailor. Fascinated by the idea of sea travel since childhood, Bruner was the first (and only) professor to sail his own boat, the Western Till, across the Atlantic Ocean to begin his faculty position at Oxford University (Amrein-Beardsley 2011). He has long served and remains at the proverbial helm in the field as well, defining the course, hoisting the sails, and guiding the ship in often uncharted waters. Proving to be a worthy helmsman for colleagues and students alike, he continues to inspire and challenge others to "develop a sense of the possible"—both within and beyond the classrooms of the new century (Amrein-Beardsley 2011).

As a past president of the American Psychological Association and exemplary member of the faculty at Harvard, Oxford, and New York University, Bruner developed a keen interest in psychology early in his post-secondary education, receiving degrees from Duke University (1937) and Harvard University (1939, 1941). Conducting pioneering research on perception and cognitive processes in his early career, Bruner has long shared his expertise, serving as a committee chair for the National Academy of Sciences and National Science Foundation, Cofounder and Director of the Harvard University Center for Cognitive Studies, member of the President's Science Advisory Committee (on the Education Panel) under the Kennedy and Johnson Administrations, and later Director of the New York Institute for the Humanities. For his distinguished contributions to cognitive development, cultural psychology, and the theory of law, Bruner has received numerous awards and honors including fellowship in the American Academy of the Arts and Sciences, election to the National Academy of Education, and honorary degrees from multiple universities in the United States and abroad. In recognition of his original contributions to research, he also received the CIBA Gold Medal for Distinguished Research (1974), G. Stanley Hall Award (1975), International Balzan Prize for "contributions to our understanding of the human mind" (1987), and the Society for Research in Child Development (1989). Also honored as one of the "fifty modern thinkers on education" (Gardner 2001), Bruner is widely recognized for his scholarly excellence in published works, including: *A Study of Thinking* (1956; with J.J. Goodnow and G.A. Austin); *The Process of Education* (1960); *Toward a Theory of Instruction* (1966); *The Relevance of Education* (1971); *Actual Minds, Possible Worlds* (1986); *Acts of Meaning* (1991); *The Culture of Education* (1996); *Minding the Law* (2000); and *Making Stories: Law Literature, and Life* (2002).

Born and raised with his two siblings in New York City by Polish immigrant parents, Bruner moved frequently throughout his childhood (following the death of his father), attending six schools before graduation. Displaying an early interest in research, Bruner pursued his doctoral studies at Harvard University in the midst of World War II. His dissertation, entitled "A Psychological Analysis of International Radio Broadcasts of Belligerent Nations," emanated from his experiences investigating public opinion, propaganda, and social attitudes in the service

of the United States Army Intelligence Corps and work as a graduate assistant for Gordon Allport, Harvard University psychologist renowned for the study of personality (Gardner 2001). Beginning his career in academia at Harvard in 1952 first as a lecturer and later a full professor, Bruner (with Leo Postman) challenged the largely behaviorist faculty at Harvard by promoting perceptions as a form of information processing that involves interpretation and selection rather than simply responding to stimuli. Reflecting on his conversations with nuclear physicist Robert Oppenheimer, Bruner et al. (1956) wrote *A Study of Thinking* with Jacqueline Goodnow and George Austin, to explain how people think about and group things into classes and categories. Bruner's research in this area provided the cornerstone for his subsequent work in cognitive development.

Defining the Course

In the late 1950s, the American public expressed increasing interest in cognitive development due in large part to the Russian launch of the satellite Sputnik in 1957. A fear of inadequate public education and related loss of economic competiveness prompted an infusion of school funding, primarily intended to elevate students' capacity in math and science. Bruner had long believed that humans could use and transmit knowledge of technology to shape their environment, a view that proved useful as Americans entered the "Space Race" with the Russians. In 1959, the National Academy of Sciences and the National Science Foundation convened 34 researchers and scholars with expertise in science and education at Woods Hole, Massachusetts. Serving as the meeting chair, Bruner guided the blue ribbon committee in their efforts to develop new science curriculum (Gardner 2001).

Describing the main themes from the conference, Bruner (1960) redirected curriculum reform efforts in early childhood education in his best-selling book, *The Process of Education* (1960). Widely respected for introducing and reinforcing the basic premise that all students can and should be engaged in active learning throughout their development, Bruner (1960) explained that:

> We begin with the hypothesis that any subject can be taught effectively in some intellectually honest form to any child at any stage of development…. The general hypothesis that has just been stated is premised on the considered judgment that any idea can be represented honestly and usefully in the thought forms of children of school age. (p. 33)

He argued that young children should learn the structure of science and other disciplines before memorizing facts and figures; students who understood each subject area could then think critically about new issues (Gardner 2001). Rejecting the idea of children as "assimilators of knowledge" or little adults, Bruner (1960) revealed the child as an active problem-solver with his/her own way of making sense of the world. Furthermore, children should be taught using spiral curriculum by introducing topics early using age appropriate techniques and continuing to revisit them over time (Bruner 1960). Bruner's prolific argument against withholding opportunities from children who otherwise would not actively engage in

science and the humanities until they reach the secondary level challenged then-conventional practices and undoubtedly reshaped the early learning experiences of generations of students.

Believing that psychology should focus on the cognitive processes (i.e., humans' unique capacity to gain, store, and work with knowledge), in 1961 Bruner co-founded the Harvard University Center for Cognitive Studies, an interdisciplinary research center devoted to the study of cognition. In collaboration with George Miller, Bruner dedicated his research to the study of human language capacity, specifically how thinking is culturally conditioned. Bruner (1996) later expressed his appreciation of culture, noting that "culture shapes the mind, providing us with the toolkit by which we construct not only our worlds but our very conception of ourselves and our powers" (p. 1). As part of his related research with Educational Services, Inc. in the early 1960s, Bruner worked collaboratively to design and implement "Man: A Course of Study," a comprehensive curriculum based on the then-contemporary understanding of behavioral sciences. The curriculum presented lessons as ethnographic and case studies with major themes, including: (1) the nature of communication systems, (2) the use of ancient and modern tools and media, and (3) kin relations and social organization of culture (Gardner 2001). As a practical application of his theories of instruction (Bruner 1966), researchers developed the course in collaboration with teachers and students for national and international use throughout the 1960s and 70s (Gardner 2001). In retrospect, Bruner discussed the pragmatic challenges of transmitting research to practice, noting that "We never quite solved the problem of getting the material from Widener (library at Harvard University) to Wichita (largest city in Kansas, the heartland of America)" (Gardner 2001, p. 93).

As issues of race and poverty took precedence in education amidst the frustrating and divisive Vietnam War, Bruner (1971) presented a compilation of essays written as early as 1964 in *The Relevance of Education.* Explaining that "educational and socializing practice, before the school years as after, reflects and reinforces the inequities of a class system" (Bruner 1971, p. 133), he further emphasizes the importance of developing problem solving skills and acquiring language as a child, especially for disadvantaged children. Reflecting this view, Bruner's work played a key role in the development of Head Start and other programs intended to quell to some extent the social turbulence of the previous decade.

Hoisting the Sails

Joining the faculty at the University of Oxford as Watts Professor of Psychology and Fellow of Wolfson College in 1972, Bruner chose an unconventional method of travel—he was the first (and only) professor to have sailed his own boat to occupy his new position. Perhaps analogous to his trans-Atlantic voyage, Bruner also embarked upon a new trajectory in his scholarly research at Oxford, developing studies of infant agency and investigations of children's language development (Gardner 2001). Initially inspired by Soviet psychologist Lev Vygotsky, Bruner

credits reading his once-banned book, *Thought and Language* (written in 1934 but suppressed by the Soviet authorities for over 20 years), as profoundly shaping his theoretical approach to language acquisition (Gardner 2001).

Later praising Vygotsky as "plainly a genius" in *Actual Minds, Possible Worlds*, Bruner (1986) described language as "(in Vygotsky's sense as in Dewey's) a way of sorting out one's thoughts about things" (p. 72). Bruner (1986) believes, like Vygotsky, that language precedes action, noting that both "reflect the tools and aids available in the culture for use…" (p. 72). Drawing heavily on Vygotsky's "Zone of Proximal Development" in his subsequent work, Bruner (1985, 1986) emphasized a social interactionist theory of language acquisition and characterizes the interactions between an adult and child as "scaffolding" language development. In *Child's Talk: Learning to Use Language*, Bruner (1985) explained the interconnectedness of three aspects of language acquisition: syntax, semantics, and pragmatics. He further argued that a child must display an understanding of grammar (although not necessarily adult grammar), refer to objects and actions with meaning, and use language to accomplish tasks (Bruner 1985). His work in language development served as a transition to subsequent research introducing cultural psychology in the field.

Charting a New Course

As a leader of the cognitive revolution, Bruner emerged as a critic of the movement by the 1970s and 80s. Publishing a series of lectures in *Acts of Meaning*, Bruner (1990) expressed concern that this movement reduced human thought to a set of computational routines (Gardner 2001). Recognizing the need to change course in the field to some extent, he echoed the concerns and commitment of colleagues when articulating the need for cultural psychology as a constructed space to consider the meaningfulness of culture in its historical context (Gardner 2001, pp. 93–94). Challenging the understanding of the world as immutable, essentially "there to be observed" (p. 1), Bruner (1991) argued that knowledge and skill acquisition are situated within domains, asynchronous and variable in their rate of accumulation, and not inherently transferrable. Bruner (1991) described these domains as akin to cultural tool kits, rarely mastered en masse by an individual but rather acquired and utilized ad hoc in domain-specific, culturally-bounded ways.

Assuming a faculty position at the New York University (NYU) School of Law in 1991, Bruner continues to guide research on narrative, studying ideas surrounding stories, specifically the role of storytelling in the legal process. In his discussion on "cultural psychology," Bruner (1990) described the importance of storytelling as "an act of *constructing* a longitudinal version of Self" (p. 120). This is not a "free construction," according to Bruner (1990, p. 120); it is constrained by the events of a life and the demands of the story the teller is in the process of constructing.

Narrative, in all its forms, is another cultural tool for knowledge construction (Bruner 1991, 2002). As defined by Bruner (1991), narrative is "a conventional form, transmitted culturally and constrained by each individual's level of mastery

and by his conglomerate of prosthetic devices, colleagues, and mentors" (p. 4). As such, narratives are appraised based on convention and necessity rather than empirical verification or logical assailability (Bruner 1991). Although many remain recalcitrant in evaluating narratives as either true or false, Bruner cautioned against such a misnomer. Arguing that the most salient concern relates to the operation of narrative "as an instrument of the mind in the construction of reality" as opposed to the construction of narrative as text (Bruner 1991, p. 5).

In *The Culture of Education* (1996), Bruner discussed the importance of four ideas in education: agency, reflection, collaboration, and culture (p. 87). Regarding *reflection*, he explained the concept of "going meta" or "turning around on what one has learned through bare exposure, even thinking about one's thinking" (p. 88). He addressed the fear that reflection will generate dangerous "alternative stories" that contradict the theories of science. He continued to explain that story making can help a child discover where a theory is needed. In *Minding the Law*, Amsterdam and Bruner (2000) argued that "the law is awash in storytelling… this endless telling and retelling, casting and recasting is essential to the conduct of the law" (p. 110). Actors (clients, lawyers, the judge, and jury) all comprehend whatever series of events is the subject of legal action through stories (Amsterdam and Bruner 2000). While law has traditionally be considered an examination of free-standing factual data, many now recognize the importance of some overall narrative in describing *what happened* or *how the world works* (Amsterdam and Bruner 2000). As part of his pioneering work in this area, Bruner founded the Colloquium on the Theory of Legal Practice (with Anthony Amsterdam, Peggy Cooper Davis, and David Richards) at the NYU School of Law to study the application of law in practice using interdisciplinary tools. He continues to examine cultural and legal practice as Research Professor of Psychology and Senior Research Fellow in Law at NYU and co-teaches the "Lawyering Theory Colloquium."

Learning the Points of Sail

Throughout a career spanning more than a half-century, Bruner has both inspired and challenged generations of researchers and educators in their scholarship and practice. Perhaps analogous to the seasoned helmsman who teaches a sailor the points of sail as a means of describing a boat's orientation in relation to the wind direction, Bruner has provided steady guidance in the field, profoundly influencing the work of colleagues, aspiring scholars, and students alike. The authors of this chapter are no exception—Bruner's conceptualization of self-narrative has provided a framework for their own research in educational policy, specifically with regards to teacher accountability systems and the impact of such systems on practitioners in context. Evidencing the expansive reach of his work, the authors have utilized self-narrative to better understand how storytelling serves as a cultural tool for teachers to construct their own identities as the subjects of and actors within teacher evaluation systems in practice.

The authors have found Bruner's recent work examining the use of storytelling in law analogous to their inquiries in educational policy, specifically relevant to practitioner narratives in the context of locally-designed and implemented teacher evaluation systems. Explaining the dilemma of narrative as imitation of life or its converse, Bruner (2002) argued that "we know in our bones that stories are *made*, not *found* in the world. But we can't resist doubting it" (p. 22). In this respect, Bruner (2002) assuaged that "we try to take the sting out of the dilemma by gracefully admitting that, indeed, stories are always told from a particular perspective" (p. 23).

He further criticized the human tendency to view a story as "a transparent window on reality, not a cookie cutter imposing a shape on it" (Bruner 2002, pp. 6–7). Characterizing self-narratives as "notably unstable" and as a result "highly susceptible to cultural, interpersonal, and linguistic influences" (p. 694), Bruner (2004) described life narratives as inherently reflective of the "possible lives" available in one's culture. Accordingly, the narrative models available for use in telling the story of one's life become another means of understanding culture (Bruner 2004, p. 694).

Bruner further argued (2004) that the cultural and linguistic determinants of self-narrative processes can wield power of their own by structuring experiences and organizing memories—in essence, one's life becomes the narrative told (p. 694). In their application of narrative as a framework for teacher evaluation, the authors recognize the fundamental importance of the culturally- and linguistically-bound "possible lives" from which teachers can choose when telling their self-narratives. Understanding these "possible lives" has become a preeminent focus in the authors' research thus far.

In the context of growing public demand in the United States for teacher accountability that relies at least in part on measures of student achievement, states have been prompted to implement policy-directed, locally-developed evaluation systems. Such systems are based on the premise that teacher quality can be both defined as a construct and quantified for the expressed purpose of making inferences about the effectiveness of individual teachers as professionals. In an effort to better understand participant perspectives regarding the purpose, components, implementation, and impact of teacher evaluation systems in context, the authors have conducted research studies that include qualitative data collection, most often interviews with individual teachers. In their analysis of interview data, the authors have utilized self-narrative as a framework for understanding the "possible lives" teachers may construct when telling their story.

The construct of teacher quality, its purportedly quantifiable domains, and the inherent inferences generated from its reification in policy and practice must be understood in terms of their policy context. In this regard, the authors argue that narratives of self are told by the 12 teachers interviewed as part of their research study in a large suburban school district in the United States. For the purpose of this chapter, the study exemplifies the use of narrative as a tool by teachers in their construction of self as effective professionals. Based on their analysis of qualitative interview data, the authors have identified a

series of "possible lives" based on the most prominent self-narratives told by teachers.

As discussed here, the "possible lives" reflect the policy context in which the teachers are enveloped, specifically the culture-laden and linguistically-bounded definition of teacher effectiveness in state legislation. In this case, teachers across the state are evaluated annually based on locally-designed systems mandated to include measures of professional practice (e.g., most often classroom observations) and student achievement (e.g., based on complex statistical models). The preliminary findings in this study suggest that teachers construct self-narratives bounded in part by the policy-directed effectiveness label they receive as part of the evaluation process (i.e., highly effective, effective, developing, ineffective). Teachers rely on these labels when choosing from "possible lives" that focus on their understanding of themselves as a good teacher.

The Highly Effective Teacher

Although the self-narratives presented here are arguably simplistic, they provide foundational descriptions of "possible lives" that merit more careful consideration and greater depth of analyses. "Highly effective" teachers generally told stories that relied as least in part upon the components of the evaluation system as evidence of their professional quality. Teachers evaluated as highly effective often discussed their professional work in terms of the characteristics and behaviors delineated in the classroom observation rubric including: (1) extensive planning, (2) use of instructional strategies based on best practices, (3) impact on student learning (e.g., academic, social, emotional), and the like. Frequently citing their students' achievement (e.g., to some extent evidenced by their scores on large-scaled standardized tests for the purposes of the evaluation system), highly effective teachers told stories that attributed value to (or at least did not detract from the value of) the evaluation process. Even when not formally articulated, teachers who received favored evaluation outcomes inherently legitimized their effectiveness label by constructing a self-narrative bounded by its components. The highly effective teachers whose stories reflected a departure from this theme may have juxtaposed their understanding of self with the evaluation components, processes, or outcome; however, their use of the evaluation system as a counterexample inherently demonstrates the contextual nature of narrative as well.

The Effective Teacher

"Effective" teachers also told stories structured at least in part based upon their participation in the evaluation process. Teachers evaluated as effective relied to some extent on the components of the classroom observation rubric to

contextualize their stories. Interestingly, their stories often extended beyond the characteristics cited in the rubric as traits of a good teacher. These attributes were frequently presented as applicable albeit incomplete indicators of their professional competence. Citing additional evidences external to the observation rubric in their construction of self, effective teachers extended the "possible lives" but remained bounded in the policy context even in their critique of the instrument as missing important attributes of quality teaching.

Additionally, effective teachers generally devalued the statistical measure of student achievement used in the evaluation system in that they rarely told stories about their professional identity that relied upon students' test scores as primary evidence. A few effective teachers even dismissed the statistical calculations as invalid, unreliable, and/or unfair; however, these criticisms generally did not detract from their narrative. Rather, they addressed the perceived inadequacies of the student achievement measure without further reference. The effective teachers' self-narratives also reflected the boundedness of their "possible lives" in their utilization and omission of various aspects of the evaluation system.

The Developing Teacher

Perhaps unsurprisingly, "developing" teachers more frequently told stories that challenged the evaluation components, processes, or outcome in some way. These teachers generally constructed their self-narrative based on a belief that they were in fact better teachers than might be inferred from their effectiveness label. Often expressing concerns related to both the evaluation system components and processes, developing teachers might have questioned the use of an arguably incomplete observation rubric or the validity, reliability, and/or fairness of the statistical model used to estimate the teacher's impact on student achievement via test scores.

In reference to the evaluation process, teachers frequently suggested that the time spent by their evaluator was insufficient to adequately capture evidence of their instructional skill. In addition, some developing teachers questioned their evaluator's objectivity, content knowledge expertise, and/or rubric-specific training as detracting from the representativeness of their evaluation outcome. As discussed in reference to highly effective and effective teachers, again as defined in the policy context, developing teachers' overall reliance upon the evaluation system as a structure for telling their stories further reflects the boundedness of "possible lives" in their use of narrative as a tool.

The Ineffective Teacher

"Ineffective" teachers' use of the evaluation system in their construction of self serves as a compelling example as well. Generally citing their less than favorable evaluation outcome as counterintuitive based to their understanding of self or even

irrelevant given the system's arguable inadequacies as a measure of effectiveness, ineffective teachers may have acknowledged areas for professional growth but generally disregarded their evaluation outcome as evidence of such. In their collective critique of the evaluation components and processes, these teachers challenged not only the comprehensiveness of the observation rubric but also their evaluators' potential bias in selecting evidences to justify their rubric score. In addition, a few teachers expressed disappointment in the inadequate amount of time spent in dialogue with their evaluator, responsiveness of their evaluator to concerns, and/or willingness of their evaluator to consider additional evidences. Furthermore, a few teachers charged that their evaluation outcome and related inferences had a detrimental effect on their professional sense of self. In this respect, the policy-directed evaluation system not only provided a structure for teachers' construction of self, its adverse impact on their narrative actually reinforced the structure. Presumably intended to prompt teacher reflection, especially among those deemed ineffective, the prominence of the evaluation system in teachers' narratives may further legitimize the system as an effective policy in practice.

Setting Sail

Bruner's distinguished contributions to contemporary understandings of cognitive development, cultural psychology, and legal processes further illustrate the relevance of and need for continued research in each area. The utility of self-narrative to the authors' research serves as only one example of Bruner's profound influence on emergent pragmatic issues of policy to practice. Further extension of Bruner's narrative research examining the intersection of culture and the law to applied research in educational policy presents an important opportunity for researchers and educators alike. The need to recognize and understand the cultural embeddedness of current educational policies from a global perspective is paramount, especially for emerging scholars and students who hope to conduct meaningful research in a rapidly changing policy environment. The ever-present need for reasoned, meaningful policy debates informed by research and grounded in theory and practice poses a challenge for emerging scholars. A new generation of researchers, educators, and students continue to look to their helmsman for inspiration and critique. As a visionary in the academy, Bruner's own personal and professional story can serve as a compass for the next leg of the journey.

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Bruner at the Bar: Jerome Bruner's Influence on Law and the Legal Academy

Eleanor Fox

In this section we present three essays and a play written by colleagues of Jerry at New York University School of Law, where Jerry taught from 1991 until he retired as emeritus in 2013. Jerry came to NYU Law School in 1991 as the visiting Meyer Professor. This professorship was reserved for distinguished scholars who were not lawyers and who promised to enrich the study of law. The Law School had in mind that Jerry, as Meyer Professor, would collaborate with Professors Anthony Amsterdam, Peggy Davis and others in constructing the theory of lawyering as an interactive, sympathetic, personal engagement between lawyer and client. Jerry's year as Meyer Professor was indeed inventive and productive. Jerry helped to construct the Colloquium on the Theory of Legal Practice, which drew upon insights from psychology, anthropology, linguistics, and literary theory. Thereafter, Jerry was appointed Research Professor at NYU Law School and University Professor at New York University. As University Professor he could choose his academic "home," and he chose the Law School, concerned that the study of psychology had become increasingly descriptive, and being attracted to the law's normative possibilities. Thus, Jerry's third academic career, after Harvard and Oxford.

Jerry had a great impact on NYU and, in particular, on a coterie of colleagues and students and on pedagogy in areas close to his heart—criminal justice, including death penalty and prisons, poverty, inequality, and culture and its meanings. His work on narrative and his essential contributions to the dilemmas of what is fact, what is intent, what is mind, and what is evil found resonance in the classroom. Moreover, his love of people and his caring for each and every one of his students produced hundreds of law graduates in his thrall.

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Jerry's closest law faculty colleagues include the four who have written the essays and play that follow. Jerry co-taught the lawyering theory colloquium with Tony Amsterdam and Peggy Davis. For almost two decades, he co-taught Culture and the Law with Oscar Chase and Vengeance and the Law with Tony Amsterdam. His intellectual companionship with David Garland, one of the world's leading law, sociology and criminology scholars, spanned the years from the early 1990s after NYU recruited him from the University of Edinburgh.

Jerry's collaboration with Professor Amsterdam—the leading anti-death penalty lawyer in the nation—ran especially deep. In their seminar they drew upon, and they endlessly discussed, Aeschylus' Oresteia. Also figuring large in their classroom and pre-class discussions were Graham Green's Brighton Rock, transcripts from the trial of Susan Smith (who was convicted of killing her two children), anthropological insights of Clifford Geertz and Bronislaw Malinowski, and psychological insights of Lev Vygotsky. Jerry and Tony collaborated in writing the wonderful book of mind and law and the treachery of assumptions that pass as fact—Minding the Law (2000). Also, they collaborated on numerous anti-death-penalty and life-without-parole briefs, resonating Jerry's work on mind and its relationship to age, environment, poverty and opportunity. The Brunerian footprint is not only in the amicus briefs but also in Supreme Court outcomes in cases such as *Roper v. Simmons*, 543 U.S. 551 (2005), prohibiting the death penalty for offenders under the age of 18; *Graham v. Florida*, 560 U.S. 48 (2010), prohibiting juvenile sentences of life imprisonment without parole for non-homicide offenses, and *Miller v. Alabama*, 132 S.Ct. 2455 (2012), requiring courts to take mitigating factors such as youth into account before juveniles convicted of homicide can be sentenced to life imprisonment without parole.

It is therefore with such pleasure that we present the essays and play that follow. First is the essay by David Garland: "Two or three things I know about Professor Bruner." Second is the essay by Peggy Davis, his early collaborator on lawyering theory: "Bringing Wonderment to the Legal Academy." Third is the essay by Oscar Chase, evolving from the Culture and the Law seminar: "Narrative, Inference, and Law in Cultural Context." Last is the play by Jerry's revered colleague Tony Amsterdam, "A Satyr Play," the notionally "recently unearthed" "fourth" play of the Oresteia, born from the bowels of the Amsterdam/Bruner Vengeance seminar. This stunning "satyr" plumbs the depths of cycles of vengeance, the human condition, and the ineluctable role of justice, casting Jerry Bruner as defense counsel for Orestes, famously charged with killing his mother, Clytemnestra, to avenge his father, Agememnon, who sacrificed their daughter, Iphegenia, before the Highest Court of gods and men. Was the predicament of Orestes not rife with mitigating circumstances? All of us can enjoy the play; but I hope above all that it is read by Jerry's and Tony's beloved law students, graduates of the Vengeance seminar—who will find that they are lovingly cast as The Chorus.

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Two or Three Things I Know About Professor Bruner

David Garland

Jerry has been a friend and a colleague for more than 20 years now. Here are a few things I've learned about him in that time.

I first got to know Jerry in the early 1990s when I was a visiting professor at NYU School of Law. At that point, NYU Law—led by an audaciously ambitious dean named John Sexton—was reinventing itself in all sorts of ways: as a top-5 law school, as a pioneer in global education, and as an interdisciplinary research center that attracted scholars from any and every discipline, so long as they were interesting and their work had some bearing on the life of the law. (I fitted into that last ambition, being a sociologist and criminologist: and perhaps the fact that I came from Scotland made me a little "global" too.) Jerry had been recruited as a distinguished university professor the previous year and although he had a position in the Psychology Department, as one would expect, he was also cross-appointed to the Law School, where he taught a lawyering theory class on "Interpretation" with Tony Amsterdam and Peggy Davis.

At some point in that year, a law school colleague suggested that I might like to have lunch with Jerry—a suggestion that was surely a thoughtful way of putting me in touch with a fellow social scientist but also, I now realize, a neat ruse to sell me on the charms and intellectual riches of NYU Law School (Which of course it did: I moved there a few years later and have been there ever since).

So Jerry and I emailed and set a date for lunch, arranging to meet in the attractive faculty restaurant atop Bobst library with its bright sunlit views of Washington Square Park and its bustling, senior common room atmosphere. That restaurant

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has long since disappeared, its sunny spaces taken over by an ever-growing university administration, but the details of that first meeting with Jerry remain bright and fresh in my memory.

It's a little embarrassing to admit now but at that time I knew rather little about Jerry, despite his fame. I knew he was a world-renowned psychologist—the Law School's publicity materials proudly said as much—and I was dimly aware that he had had a hand in developing modern cognitive psychology. I had also read one or two of his essays in the *New York Review of Books*—I recalled Jerry's review of a book by Oliver Sacks and another about the role of culture in the acquisition of language—but beyond that: nothing much. And as for Jerry the man—or the lunch companion—I didn't have the faintest idea. What if he were stuffy? Or pompous and grand? What if he were to talk about his work and uncover my shameful ignorance of it? What if he were just dull? (My prior experiences with ultra-distinguished academics had not always been encouraging: back in the UK I had once complimented a famous sociologist on the remarkable breadth of his work only to be told "You don't know the half of it!")

So I decided I should do some background preparation prior to our get-together. And because these were the days before Google, that meant going to the university library, checking the author catalogue, and leafing through Jerry's books to get some sense of what he had been up to. I don't clearly remember which of the Bruner publications were there in the stacks on the 4th floor of the university library: I recall seeing *On Knowing: Essays for the Left Hand* (1966) (a copy of which I subsequently acquired) and *The Process of Education* (a best-seller published in 1960 and still in print to this day). And *Acts of Meaning* (1990) had just been published, so perhaps it was there too. But the book that caught my eye, and which I proceeded to read over the next few days with equal parts astonishment and pleasure, was *In Search of Mind: Essays in Autobiography* (1983). Today, twenty-odd years later, a copy of that book sits on my desk, and if anyone reading this appreciation hasn't yet had done so, I urge you to get a hold of it immediately. Its combination of personal charm, life-and-works biography, star-studded intellectual history, and sheer narrative pleasure, is simply unbeatable.

It has been twenty years since I read that marvelous memoir—commissioned for the Alfred P. Sloan Foundation's 'lives in science' series—but here are some of the plot-elements and anecdotes that have stayed with me ever since.

First and foremost, Jerry's encounters and collaborations with the luminaries of the academic universe: each episode framed by theoretical asides, transfixing I-was-there detail, and a relaxed familiarity with the common rooms and dining tables of the world's leading universities and research centers. Jean-Paul Sartre, Jean Piaget, Noam Chomsky, Robert Oppenheimer, B.F. Skinner, Isaiah Berlin, Anthony Kenny, Charles Taylor, Iris Murdoch, Talcott Parsons, Gordon Allport, Claude Levi-Straus, Erving Goffman, Roman Jakobson, Ruth Benedict, and Margaret Mead are among the cast of characters that populate the scenes and stories that Jerry recounts. And nor is this merely high-class name-dropping for the sake of entertaining the reader. (Though what would be the harm in that?—Jerry's name makes as big a splash as any of them.)

Each character or encounter is introduced in a way that helps plot the unfolding of an institutional development, a scientific debate or a psychological discovery—about the nature of perception, cognition, language, culture, narrative, and so on—in many of which Professor Bruner himself had a hand. In Jerry's warmly colored recollections, these scientific journeys are always made of human as well as intellectual stuff. Look, for example, at what he has to say about the contrasting personalities of Piaget and Vygotsky ("Though I know Piaget and never got to meet Vygotsky, I feel I got to know Vygotsky better as person") or about Talcott Parsons ("a honeybee, searching out new flowers with which we in Social Relations could cross-pollinate"); or about the sources of unhappiness in the "institutionally appalling" department that he took over when he moved to Oxford. From every encounter there are philosophical inferences to be drawn and thinking about human nature to be deepened—and Jerry shares these with the reader in a prose style that somehow manages to be light, relaxed, and intimate despite the weight of erudition it bears.

And then there are Jerry's personal vicissitudes. He was born blind, not receiving "the gift of sight" until a surgery at the end his second year. "I have no memories connected either with my early blindness or with my newly found sight, none whatsoever." His family's fortune was lost in 1922 when his father invested in grain and malt companies "on a firm tip that Prohibition was about to be repealed." His father—to whose memory the book is dedicated—died in 1927 when Jerry was still a boy, after which came frequent moves from town to town ("six different high schools in four years") with his plucky, distant, distracted mother. Then the take-off of Jerry's career—from Duke to Princeton, Harvard and Oxford—once he had discovered the questions that he would make his own.

Here is the passage where he recounts, with that distinctive note of boyish pleasure and excitement, how his scientific journey—at once aleatory and determined—led from one discovery or insight to another:

> Studying perception, becoming convinced that the true story lay in our powers of inference, I shifted to the study of thinking. When I sensed that the way we psychologists studied thinking was too square, too lacking in opportunity for the expression of intuition by our 'subjects', I was drawn off to a season of studying an inventors' group and of reading mythology. And then, because the processes of thought are so swift, I retreated to the study of cognitive development, hoping to find my quarry in simpler surroundings moving at a slower pace, until I was finally studying infants. And then back I came from that venture, studying language because it seemed to be what was shaping the primitive processes of early cognition (1983, p. 8).

As I read this remarkable, event-filled memoir, what came across most powerfully to me was not the depth of Jerry immersion in the world of science and literature, or the great good fortune of someone who had lived such a life and was very much still living it. What struck me most was his sheer love of people and their foibles: his piercing—and often piercingly funny—descriptions of the social and intellectual scenes at Duke, Harvard, and Oxford; his account of the research, the questions that drove it, the experiments that he and his collaborators came up with; the debates and struggles over the soul of psychology; his public involvements; his ability to tell a tale and teach you something at the same time….You can't imagine how much I looked forward to lunch after reading it.

I soon learned at lunch that the author of this astonishing book—the person who had made this remarkable, prodigious life for himself—was warm, modest, gregarious, a beguiling story-teller, and hugely enjoyable to be with. Moreover—and this was to be true of Jerry in the decades that followed—he wasn't in the least interested in reciting his past triumphs and achievements. Indeed he wasn't especially interested in talking about psychology or about the past. He was—and he still is—intensely interested in the person he is talking to; and in what is happening in the world right now. So at lunch, his chief concern was getting to know me; learning what was I up to; discovering which part of Scotland I came from (he knows Scotland well, of course); how I found the shift from Edinburgh to New York (identifying tell-tale details of cultural difference is a stock-in-trade of Bruner conversation); what I thought about the law school and its professional ambitions; and eventually, once we had established a rapport and a comfort level conducive to thinking together: what did I think about this new, law-related problem he was mulling over in his mind. 'Grand' and/or 'stuffy' could not have been wider of the mark.

Every time I've met him since—in the corridors in the law school, on the street in Greenwich Village, sitting beside him at some colloquium, as his guest in the seminar he taught on law and culture—it's the same thing: "David, I've been puzzling about X: what do you think of this way of framing the problem…..?" Go to lunch in his apartment and you will no sooner have knocked on the door than there stands a smiling, slightly distracted Bruner, with the threshold remark: "David, I've been thinking…."

Jerry was well beyond three score and ten when we first met, and in the decades that have followed, I have sometimes been prompted to remark on the wonderful contrast between his chronological age and his youthful energy and productivity. But Jerry won't hear of it. So much so that I have learned not to mention it, deciding that if he regards it as a trivial irrelevance, I ought to do so as well. He wears his age lightly, like a thin cloak that can be thrown off at any time. (In a magazine profile published earlier this year under the title "The Centenarian Psychologist", the interviewer introduces the subject by asking "You'll be turning 100 this year…." to which Jerry responds with a polite, cheerful, "Yes, nifty isn't it?" Now that's out the way, you can feel him thinking, can we get back to more interesting topics?

In Jerry's company there are none of the "organ recitals" that often pervade the conversations of the elderly: no long, pained rehearsals of what is wrong with this organ or that. If you ask Jerry about his health, he might give you a brief, polite update but he will present these encounters with the medical world offhandedly, as so many amusing episodes. Instead of alarm or anxiety what he projects is a mild amusement at the young doctors—they are all young now—and their diagnoses and concerns: it is as if he is indulging them. His sunny mood is a triumph of the will and perhaps of the character. Jerry's mind, like his psychology, is always and necessarily embodied. But it is the mind that prevails.

One of Jerry's important psychological insights is captured by his well-coined phrase "Going beyond the information given"—and he famously demonstrated

that human cognition, or intelligence, should be understood as our ability to move beyond perception in a principled way. By applying the logics, codes, concepts and narratives that we acquire from culture and from social life we unlock our innate capacity to *think*. Another well-known Bruner insight is that the basis for education and culture in their higher senses is not survival, as the evolutionists think, but *curiosity*: that capacity to be interested, to be engaged, to be fascinated with the world. And there is no one more curious, more *fascinated* by the world than Jerome Bruner.

When I sat down to writing this note, I found myself leafing through *In Search of Mind* once again, rediscovering the passages that I had so enjoyed a quarter century before. And, having gotten to know the man in the meantime, I'm struck by how deeply self-aware Jerry was when he wrote that book and how many of his sentences offer a key to understanding this remarkable man. So let me conclude by quoting one or two of my favorites.

Explaining that he was born two years after his sister, Jerry remarks that he was "*conceived out of my mother's conviction that it is better to raise children in pairs—a child of a theory*" (1983, p. 10).

Describing himself as a child, as being *"head-in-clouds and enthusiastic…. cheerful enough to be called 'Sonny' (or was it 'Sunny'?)"* adding that "*I suppose I continued to be 'bright' and buoyant and relatively cheerful…. There is some way in which I have, like Peter Pan, remained a child—or rather, there is always a child in the cast ready to speak more lines than it seems were allotted to him*" (1983, p. 5).

Growing up, moving from home to life as an undergraduate at Duke University, he says *"I became a man of intentions"* and early on *"formed the conviction that showing what is possible will alter what one will do"*.

Of his intellectual style, he writes, "*I am a fox rather than a hedgehog, preferring to know many things rather than one big thing…. I am not a good discipline man and do not like boundaries…. There have been times when I thought I would have been better off in the seventeenth century, when it was more usual to follow one's curiosity than the straighter arrow of specialist study*" (1983, p. 9).

Finally, the one that stays most vividly in my mind: "*When in 1972 I was lured to Oxford, my wife and I sailed across the Atlantic in our sailboat, Wester Till with some friends as crew. It was a great adventure, birds with us virtually all the way—the good luck of a June passage by the northern route, replete with icebergs. The Vice Chancellor assured me on my arrival in Oxford that no other professor in the history of the university has ever thus sailed to his chair, though a professor surgery in the nineteenth century, a Scot, had driven a wagon from John O'Groats in the far north of Scotland to Merton, where he parked it outside, only to find that it had been stolen when he returned to drive it to the stable*" (1983, p. 285).

In Search of Mind was published in 1983. At that point in Professor Bruner's century-long voyage there was no clear indication that the study of cognition would lead him to culture, and to narrative, and eventually to the serious narratives and forensic rhetoric that are the stuff of case law and litigation. But in retrospect, his late turn to the study of law makes perfect intellectual sense—as

readers of his book *Minding the Law* (2000) (co-authored with Tony Amsterdam) will know. Perhaps it makes biographical and psychological sense too, since that story-line was already prefigured by an intuition that Jerry mentions towards the end of his memoir: *"I think my father vaguely harbored the idea that I should be a lawyer…."*

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Bringing Wonderment to the Legal Academy

Peggy Cooper Davis

In the 1980s, the NYU law school was pioneering a quiet revolution in legal education. Anthony Amsterdam, legendary both as a litigator and as a legal scholar, was leading the best clinical program in United States legal education and beginning to expand the use of experiential learning throughout the law school curriculum. Experiential legal training was not new. At the end of the nineteenth century, Harvard Law School's Dean Christopher Columbus Langdell had transformed the law professor from a reciter of legal principles to an inquisitor testing students' capacity to reason from precedent to answer new legal questions. Now, Amsterdam was asking law professors to go beyond being Socratic inquisitors—first, to become scholars of legal process and then, to nurture students' sophistication about the deliberative social practices involved in arguing, using and extending the law. A huge ask. Even a devoted Amsterdam disciple like myself trembled a bit at the invitation. Happily, we were calmed and fortified when we encountered Jerome Bruner, a Pied Piper of interdisciplinary wonder.

I first saw Jerry at one of the periodic lunches the New York Institute for the Humanities holds—or used to hold—in a dim and smugly cozy room on the northern edge of Washington Square. I was a novice professor at the Law School that sits at the southern edge of Washington Square, trotting across each month to mingle with the University's best and brightest scholars of "The Humanities." I had completed a decade or so of lawyering and judging and was trying to understand how best to train aspiring lawyers.

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Lunching on the other side of the Square was an important part of my agenda as a developing law professor. Although I would have been at pains to explain it, I had a firm conviction that engagement with the humanities was a necessary grounding for successful professional training. Amsterdam's experiential learning project seemed to imply as much, for it put students in role and in the complicated mix of ego, group, and culture from which legal pronouncements (and legal consequences) often emerge. As it turned out, Jerry would give us words to explain why being a good professional school teacher—or being a successful student within a profession—requires serious interdisciplinary thought. And he would show us what fun and excitement that kind of thinking could bring.

The Institute's members did not gather behind drawn shades, but when Jerry walked in it seemed as if shades had been lifted. Engagement intensified. Jerry's talk was embellished by gestures and body language that suggested delicious secret-sharing. He didn't *tell* us things as much as he pointed out things and invited us to be curious about them. This was a tactic he said he learned from a remarkable elementary school teacher who would prompt her students' activities with sentences that began: "I wonder why…."

Jerry's wonderings carried insights from the astonishing range of fields he commanded and helped to shape. Sweeping across cognitive theory, education, linguistics, literary criticism and cultural anthropology, he sparked thinking throughout an intellectually diverse room. When Jerry talked about his classic study showing that poor children overestimate the size of coins far more than rich children do, a sociologist thought more richly about income inequality, and an educator thought differently about children's counting exercises. Jerry offered a snippet of discourse: A asks, "Have you seen Paul? B answers", "I saw a yellow volkswagon in front of Mary's." In seconds, his audience had a new appreciation of how premises go unstated in ordinary conversation: Paul must drive a yellow Volkswagon, and Paul must be in the habit of visiting Mary. With this, a social psychologist would gain new insight about speakers' need for charitable listening and about listeners' connection or estrangement. Jerry wondered why well-formed stories generate momentum to restore a prized but disrupted state of affairs, and a fiction-writer, or a literary critic, had new tools for constructing or analyzing plots.

Observing all of this, I began to realize—with delight approaching glee—that virtually all of Jerry's musings stimulated and enriched thinking about law and lawyering. How might witness perception be affected by need or desire? How might mistakes about shared premises corrupt a client interview or derail a negotiation? If, as Jerry suggested, humans are wired for receptivity to narrative form, and if, as Jerry suggested, narratives generate a longing to smite trouble (or trouble-makers) and restore a disrupted stasis, then why not cast judges (and other decision-makers) as heroes who could discipline trouble-makers and restore happiness? Who could, for example, punish the negligent and restore us all to a state of mutual care?

Then came the ton of bricks. Seeing that witness perception is affected by desire, or that communications were loaded with unnoticed and unstated assumptions, or that a judge's mind responds to plot was but a piece of seeing law as

something constructed as humans address actual or potential conflict in ways patterned by both cognition and culture. And Jerome Bruner was the perfect tutor for legal educators trying to develop—and to share with students—a sophistication about how law is practiced, made, and used.

I may have run back across Washington Square Park. Such was my eagerness to tell Tony Amsterdam that I had found an invaluable ally in the quest to understand, and to teach, what we called Lawyering.

The rest is history. Jerry joined us, first as a Fellow within the law school and then as a University Professor. Thus began the study of something that we called Lawyering Theory. Thus began a Lawyering Theory Colloquium that spawned a vibrant new kind of legal scholarship. And thus began the astonishing collaboration within which Bruner and Amsterdam produced *Minding the Law*: another Bruner classic and a bible of a sort for those of us who study law as a culturally embedded and inescapably human construction.

Narrative, Inference, and Law in Cultural Context

Oscar G. Chase

2015 Preface by Oscar G. Chase on the Occasion of Jerome Bruner's Centennial

For almost two decades beginning in the mid-90s, I had the great pleasure and honor of co-teaching with Jerry Bruner a seminar called Culture and Law at the NYU School of Law. Having previously contributed so much to psychology and education, Jerry had become interested in law and all its peculiarities soon after he joined the NYU faculty as a University Professor. Before long he was contributing to our understanding of law's connection to the minds of those who live in and under it (this led to, among other things, to the influential book, Minding the Law (2000), that he co-wrote with Anthony Amsterdam, another NYU colleague). Among the "other things" that intrigued Jerry was the trilateral relationship of law, psychology and culture. As I had been teaching the Culture and Law seminar for some years, we realized that we had mutual interests (and soon thereafter, mutual affection) so it made perfect sense for us to join intellectual forces in the form of co-teaching. Together with our students and occasional guest scholars, we plumbed those issues. Jerry certainly broadened my understanding of the interior and exterior "worlds" law lives in, and I like to think that his facility with

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law grew as well. Our joint 2003 conference piece, set out below, will give you a taste of what we were about. But only a taste, because in addition to pursuing our own scholarly writing, for both of us, a principal focus was always on the students. Jerry of course cares enormously about the art of teaching; and few things please him more than a really fine student paper. "Oscar," he would say, "isn't [Ms. or Mrs.'] paper terrific!" I once replied, "Jerry I am so impressed that with all your scholarly projects done and to-be-done, you care so much about student work." Looking at me quizzically, he made an observation I shall not forget: "Oscar, what the hell are we in this business for if we don't enjoy good student work!"

On a more personal note: Jerry, you are mentor, guide, educator, inspiration, and dear friend.

Narrative, Inference, and Reality

Where to begin a discussion of inference, narrative, and law? Perhaps best start abstractly, for inference itself is an abstract idea. It is a method of evaluating the truth of a proposition by observing other phenomena, themselves believed to be true, and then testing the proposition against one or more truth-seeking criteria. One obvious difficulty, of course, is that the "other phenomena" against which we must check are past events whose certainty may also be in doubt. In any case, we can identify four criteria that may be (and often are) used in the inferential process: (a) some sort of "consensual" criterion (every witness to the event agrees on a particular account); (b) some sort of "intentional" criterion (the witness has no motive to lie and has a motive to be truthful, such as an oath); (c) some sort of "coherence" criterion (what's been told makes sense, hangs together, fits the context just right); (d) some sort of "need" criterion (what's been told fits the political or personal need of the decider).

Each of these criteria is presumed to be based upon knowing and taking advantage of departures from randomness in a postulated world of unrelated, independent events. Only when events in the world turn out to be non-random and related to each other do we usually rely on inference. Inference depends on our sensitivity to order in the world, on our knowing how come the world isn't "one damned thing after another." In my view, the order on which we depend for our inferences is "made" as often as "found." And it's precisely at this point that inference gets interesting as a human rather than just a statistical problem.

One of the important human attributes that affects the inferential process is our dependence on narrative. For we tend to construe departures from randomness in the world as expressing some sort of story or narrative, and this gives our inferences a distinctive twist, which is illustrated below. I want to argue in this paper that narrative is an essential aspect of the process of "inferring truth," and that the believability of narratively driven inferences is culturally specific rather than abstractly general (as with inference in its general, logical sense).

So, to begin with, how does a story guide inference? And what exactly is a story or narrative? The prototype story starts by setting forth or implying some expected state of the world—how things are supposed to be under ordinary

conditions: "I was walking along Bleecker Street the other day…" There follows some violation or disruption of what had been expected when one was so engaged: "…then this guy comes up to me and asks right out, 'Hey, would you like to buy a theory…'" Aristotle called such disruption of the expected the "peripéteia." A breached expectation in turn impels efforts either to restore the expected state ("You've got to be kidding, fella. Is this some kind of a rag?") or to change expectancies about what's to be expected these days ("Interesting. Who's selling theories these days?") The story continues until some resolution is reached—e.g., the episode is some sort of rag, or a new kind of marketing has come into being around university neighborhoods, or the guy is out of his mind and we get him to the student health service, whatever. All the above is often followed up with a coda, a normative aphorism summing it all up, as in Aesop's fables, like "No telling what you'll run into these days!" Those are the bare bones of narrative, and they are mighty sturdy, mighty ancient bones!

A story, again typically (and this time echoing the great Burke 1945) a story is composed of a Pentad of constituents: an Agent, an Act, a Purpose (or Goal), an Agency by which action is effected, and a Scene (or Setting) in which things are occurring: Agent, Act, Goal, Agency, and Scene. When any of these constituents gets out of whack with the others, Trouble ensues: again Aristotle's peripéteia. As the tantalizing Russian folklorist Propp (1968) put it long ago, a narrative's constituents achieve their significance, their meaning, by their place in the plot of the story. They are all creatures of the story of which they are a part, functions of the story, as Propp would say.

So how, then, does narrative guide inference? Paraphrasing Vladimir Propp again, traditional narratives display a voracious and stubborn integrity. They not only hang together tenaciously, but assimilate whatever they can to make them fit their narrative requirements. Narrative is thus essential to the "coherence" phenomenon we described earlier. Narratives are expected to make sense and events will be interpreted in the light of the expected. In the quest story, as Propp calls it, a young and well-born young adventurer, Prince, courageous orphan, is left alone, deserted, abandoned. He sets forth on an adventure, pilgrimage, journey, and encounters a fair young maid who is enchanted by or captive of an evil parent, witch, ogre. He and the maiden fall in love, he rescues her, only to encounters an opposing dragon, witch, monster whom he must slay, trick, evade, etc. etc. The story's content ("functions of the plot," as Propp calls them) may vary locally, but its narrative form remains invariant. And the number of story forms in the world are, of course, limited.

It is narrative expectation that lead us to inferences about what is required next, what is congruent with the story line that has been established—what "fits" and what doesn't.

Narrative and Culture

In many ways, English common-law writs are like classic folk-tales, each exemplified by a set of local variants. Indeed, even the classic names of the writs serve somewhat as the story's coda—moderata misericordia, quare clausum fregit,

assumpsit on quantum meruit. It is this narrative integrity that guides legal inferences, that makes us see or imagine things as hanging together in particular cases. Somehow, we begin to intuit how much penalty a given infraction deserve, or when indeed an entry is a trespass, or what's a fair and reasonable recompense for work done. Challenged, our standard lawyerly answer is "Go look at the precedents." Reading Anthony Fitz Herbert's classic 16th century hornbook, the New Naturum Brevium gives one a lively, implicit sense of what the "right story" to tell when seeking redress for a particular wrong. The doctrine of stare decisis, which limits the range of wrongs a court may redress, leads us to assimilate variations to standard, traditional forms. And therein lies the opportunity and the risk of narratively guided inference—the opportunity to clarify and the risk of doing so too easily.

To protect against the power of narrative to convince too easily, Anglo-American common law is crafted with a view to pitting adversarial stories against each others. Both sides get a turn, and each side may cross-examine the other's stories. Yet, the story that prevails, whether in the minds of jurors or in the holdings of appellate judges, is the one that is "most believable" and one that fits the narrative pattern of the "continued story" that comprises a line of precedent.

One last point before turning to an illustration of what's been said thus far. Recall that the engine of narrative is the upset of the expected, the banal, the habitual. In that famous chapter on "Habit" in William James's Principles (1950), he remarks on the fact that "habits often become motives," we come to treasure their exercise as if they were vital needs. It's in the nature of legal pleading particularly, but also in judicial holdings, that the legitimacy of a story's initial canonical state becomes inflated, exaggerated, even sanctified.

Now to a case that illustrates the power and riskiness of narrative-based inference. Amsterdam and Bruner (2000), in their recent *Minding the Law*, describe the striking opinion written by Justice Scalia. in Michael H.V. Gerald D.[1] The case is about the relationship between a natural father and the child conceived by him and another man's wife, the specific legal issue being whether the out-of-wedlock father's claim to visitation rights would be protected as a "liberty interest" protected by the Due Process Clause of the Fourteenth Amendment.

The figures in the story are plainly contemporary. There is a married couple, Carole and Gerald, living together in California except when either is away on a business trip. A couple of years into her marriage with Gerald, Carole starts a six-year affair with Michael, a man living nearby in California. Three years after the affair began, Carole gives birth to a daughter, Victoria, a few months after which Gerald moved permanently to New York. Carole and Victoria stay behind in California, mostly living with Michael, though Carole also had a brief affair with another man as well. Carole believed Victoria was Michael's child, and blood

[1]491 U.S. 110, 105 L.Ed. 2d 91, 109 S.Ct. 2333 (1989). The description of the case is based, with Jerome Bruner's permission, on the discussion found and discussed more fully in Amsterdam and Bruner (2000).

test showed the probability of this being so was 98.07 %. Indeed, Michael publicly treated Victoria as his daughter in the seven or eight months he, Carole, and Victoria lived together in California over a three and a half year period. Gerald, however, was listed as Victoria's father on her birth certificate and he also treated her publicly as his daughter.

When Victoria was a little over a year old, Carole refused to let Michael see Victoria any longer, whereupon he filed a legal action for a declaration of paternity and visitation rights. Through a court-appointed guardian ad litem, Victoria asked the court to permit her to maintain filial relationship with both Michael and Gerald. The court thereupon gave Michael restricted visitation rights while leaving Victoria in Carole's sole custody, pending litigation. Two years later, Carole and Victoria moved to New York and resumed living with Gerald, who then immediately moved for a summary judgment in Michael's paternity case on grounds that there were no triable issues of fact involved since, by an applicable California statute "the issue of a wife cohabiting with her husband, who is not impotent or sterile, is conclusively presumed to be a child of the marriage."

Michael (and Victoria through her guardian ad litem) responded by asserting that the applicable statute would violate their right to due process by forbidding them to prove factually that Michael was Victoria's father. The California trial court rejected their argument, refusing to receive evidence of Michael's paternity. Gerald's motion for a summary judgment was granted and, indeed, Michael's visitation rights were terminated as being inconsistent with Gerald's exclusive parentage. The California Court of Appeals affirmed and the California Supreme Court declined discretionary review, whereupon Michael and Victoria appealed to the Supreme Court of the United States.

That Court forthwith rejected Michael's constitutional claims with the all-too-familiar vote of five to four. Justice Scalia was joined by Chief Justice Rehnquist and, except for one footnote, by Justices O'Connor and Kennedy, in holding that the relationship between Michael and Victoria did not constitute a protected "liberty interest" as intended by the Due Process Clause of the Fourteenth Amendment. The dissent argued that a Fourteenth Amendment "liberty" could not be terminated on the sole ground of a California statute's mere presumption of Gerald's paternity.

Justice Scalia's narrative of the case is as striking as his interpretation of the "liberty interest" of the Due Process Clause. Within three lines of the opening of his argument he states,

> California law, like nature itself, makes no provision for dual fatherhood. Michael was seeking to be declared the father of Victoria.[2]

This then portrays the case as the story of Gerald and Michael being rivals for Victoria.

[2]491 U.S. at 418.

> …to provide protection to an adulterous natural father is to deny protection to a marital father, and vice versa.[3]

Imposed on the case is the classic script of the "unitary family" threatened by the wicked despoiler. Justice Scalia casts the narrative as a winner-take-all combat. After declaring that "Michael was seeking to be declared *the* father of Victoria," he goes on:

> The immediate benefit he evidently sought to obtain from that status was visitation rights… But if Michael were successful in being declared the father, other rights would follow – most importantly, the right to be considered as the parent who should have custody,…a status which 'embrace[s] the sum of parental rights with respect to the rearing of a child…' [4]

Whereupon Justice Scalia cites verbatim and in extenso from a California family law hornbook just how extensive such rights would be.

The tale of Victoria, Carole, Gerald, and Michael has been transformed by the Court from a rather sad modern tale into an old-style, anachronistic morality play: Michael has become the greedy despoiler, Gerald is upholding family rights, while the two feminine figures have been virtually painted out of existence. Carole and Gerald's individual plights have been scrubbed clean, reality sanitized in the light of law. We gain few insights into the confusions and mishaps of contemporary life from Justice Scalia's narrative. It has been transformed into cast of prepared characters—a hero, a villain-despoiler, and by implication a feckless woman, and victim child. And the Court's narrative will now enter the corpus juris, a guide to future stare decisis.

Narrative and Law

A vexing problem in any fact-based dispute resolution system is sorting among different versions of past events. No system can claim complete reliability because the past cannot be fully reconstructed and is ultimately unknowable (the difficulties are pointed in our own system, as we have been forced to confront the undermining of traditional methodologies such as confession, eye-witness testimony, and fingerprints). Each society does its best, using the criteria we described earlier. A compelling narrative, a story that makes sense, becomes increasingly attractive to decision-makers.

Trial lawyers are, of course, well aware of narrative's force. Thumb through any of the many guide books for trial lawyers and see if you can find one that does not instruct on the importance of a persuasive "story" to present the jury. The "OJ" trial is a famous example. The defense team did not merely attack the credibility of the prosecution witnesses—they offered an alternative story. Allusions

[3] 491 U.S. at 130.

[4] Id. at 118–119.

to the "Colombian Necktie" suggested that the cut throats were the work of drug lords with a grievance against a regular customer. That no evidence supported the theory was irrelevant. It provided a narrative version that allowed jurors skeptical of, or hostile to, the prosecution with one more respectable reason to acquit. To be convincing the narrative must be plausible within the culture doing the evaluating. This involves local detail. In the OJ example the jury is ready to embrace the drug murder theory, because of locally specific "well-known" use of drugs by the rich and trendy murder victims. In the local culture an allusion to the drug connection is enough to create the salient inference.

The work that "local knowledge" does in making narrative credible in the service of judgment is also illustrated by the "Central Park Jogger" case. As New Yorkers will recall, a criminal prosecution was brought against a group of African-American teenagers some years ago after a women who had been jogging in the park was found unconscious, the victim of a brutal rape and assault. Although she recovered, she had no memory of the event and could not identify her attackers. The defendants were arrested when they were identified by other persons who had been assaulted and mugged in the park at around the same time as the rape. After extensive police interrogation, the defendants confessed. They were convicted on the basis of their confessions and other evidence, though no one claimed to have witnessed the assault on the jogger. Years later, a convict serving time for other rapes and assaults announced that he had violated the jogger, and had acted alone. Following a new investigation, and many demonstrations and protests in support of the original defendants, the D.A. successfully moved to set aside the conviction. He focussed primarily on the new confession and alleged weaknesses in the police interrogations/investigation. Thus, two different narratives, both culturally-based, supported the different outcomes. In the first, leading to the conviction, the story is one of wild black teens, out to cause mayhem in the park, raping a white woman. In the second, racist cops, out to get a conviction in a notorious and unsolved crime, zeroed in on the black kids and tricked or coerced them into false confessions.

Now a word about another source of narrative's power over inference, perhaps its greatest power. It is narrative's uncanny power to convince, to make it seem that *this* story is the *right* story, the *true* story, even the *only* story. As noted earlier, the adversarial nature of legal process protects us somewhat from such extremes. Yet, we do well to examine this quality of verisimilitude in stories. The "reality creating" power of stories certainly lies well beyond that of the syllogism or of statistical proof. For believability is nourished by desire, by loyalty, and by the myriad things that create and nourish self-interest. And self-interest is inevitably shaped as well by one's culture loyalties and identifications that are so subtly established by where and with whom one grows up and continues to interact. So it is not surprising that a Manhattan jury could easily be drawn that would convict the accused parties in the Central Park Jogger. The testimony in the case fit a by-now standardized and fearsome narrative of the alien marauder, instantiated in this instance by a band of teenage African-American boys out for no good on a summer evening. It "confirmed" a culturally ingrained, politically commodious

version of reality and in that sense impelled an unwarranted certainty of inference. The conviction, to be sure, was reversed on the basis of later evidence. Our point, rather, is that it was the first narrative's fit to a culturally standardized and socially "useful" folk-tale that led it to prevail. But let it be noted that the ultimately successful later narrative that led to the setting aside of the first conviction *also* reflected cultural conceptions about how our society works—different ones, to be sure, also stemming from deep-seated cultural beliefs about how life among us should be. This latter narrative comforts because it represents our society as fair, just, and non-discriminatory, a view that also has its canonical narratives in our conflicted culture.

This account seeks to refresh recognition of narrative's power in guiding inference, even if it does so quite surreptitiously at times. Perhaps the only defense against narrative's treacherous *sub rosa* effects is to assure that competing narratives are heard in court, "lest one good story should corrupt the world." For stories, after all, are surely our chief means for imposing order on the human scene.

Acknowledgments Russell D. Niles Professor of Law, New York University School of Law. It is with deep gratitude to Jerome Bruner that I dedicate this brief essay to him. No one familiar with his work will miss the "Brunerian" influences on my essay; in particular the explication of narrative and the whimsical-but-serious examples. As the saying goes: "If you are going to learn, learn from the best." I therefore make no apology for having internalized much of Jerry's wisdom after many years of teaching together. I do insist that any errors in the work are mine alone. I acknowledge with thanks the support of the Filomen D'Agostino and Max E. Greenberg Fund of the NYU School of Law.

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A Satyr Play

Anthony G. Amsterdam

Aeschylus's *Oresteia* has fascinated legal theorists. And if there is one quirk of Jerry Bruner's that makes him who he is, it is Jerry's capacity to find fascination in everything. Unsurprisingly, *The Oresteia* has long captured Jerry's imagination.

In many of the meetings that preceded every class we taught together, he and I mused about what meaning we might make of the Aeschylean trilogy. We started from Kenneth Burke's twin observations – one trite, one incisive – that "the great Greek tragedies were devices for treating of civic tensions … and for contributing to social amity by ritual devices for resolving such tensions,"[1] and that when the social "network of expectancies and fulfilments … [is] summed up *dramatically* … [and] converted into the fullness of tragedy, … an almost terrifying *thoroughness* of human honesty is demanded of us, as audience."[2] Thoroughness drove us beyond the traditional view that *The Oresteia* celebrates the victory of the Rule of Law, rationally administered by courts of justice, over an eldritch regime of ever-recycling blood vengeance.[3] But we balked at the opposing view that this

[1]Kenneth Burke, *Form and Persecution in the Oresteia*, 40 The Sewanee Review 377, 394 (1952) [hereafter, Burke].

[2]Burke at 380.

[3]For varying illustrations of this view, see Anthony J. Podlecki, The Political Background of Aeschylean Tragedy 63 - 81 (University of Michigan Press 1966); Brooks Otis, Cosmos and Tragedy: An Essay on the Meaning of Aeschylus (University of North Carolina Press 1981) [hereafter, Otis]; Richard Kuhns, The House, The City and the Judge: The Growth of Moral Awareness in the Oresteia (Bobbs-Merrill 1962) [hereafter, Kuhns]; Harry L. Levy, *The Oresteia of Aeschylus*, 4 Drama Survey 149 (1965). Paul Gewirtz endorses it, finding in *The Oresteia* "the aspiration for a wise resolution of conflict" through "the possibility of closure that a legal judgment provides" – ("Before law – without courts – there is revenge after revenge, a

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supposedly civilizing victory was hypocritical and hollow: – that "Aeschylus portrays a cosmic and political order which is neither moral nor just, but rather tyrannical, in the sense that its ultimate foundations are force and fear."[4]

Mondays and Wednesdays we saw the arc of the trilogy as ascending from the compelling savagery of the first play, *Agamemnon*, to the triumph of the Rule of Law in the third play, *The Eumenides*. Tuesdays and Thursdays we saw the arc as descending from *Agamemnon*'s raw, unflinching struggle of creatures trapped in the contradictions of the human condition into the *The Eumenides*'s conscience-drugging "dramatized legalism" and "ingenious hagglings."[5] Fridays we usually disagreed. The opportunity to try again to persuade my dearest friend and colleague of my [latest] reading of the mystery is irresistible. So, Jerry, here is that lost satyr play with which the *Oresteia* ends:

The Players

Assistant Prosecutor	-	Anthony Amsterdam
Chief Prosecutor	-	Antonin Scalia
Defense Counsel	-	Jerome Bruner
Zeus	-	William H. Rehnquist
Hera	-	Sandra Day O'Connor
Hephaistos	-	Anthony M. Kennedy
Three Justices in Blue Robes, Three in Red	-	Extras.[6]
The Chorus	-	500 beloved NYU law students

A neo-Corinthian 1930's appellate courtroom.

Zeus: Call the case of *The Erinyes v. Orestes*.

AGA: Anthony Amsterdam for the petitioners. I prosecute on behalf of both the State of Argos and its judiciary, the Erinyes.

Footnote 3 (continued)

cycle of violence without end. … With law, there is the possibility of an ending, both in individual cases and in systemic struggles. The establishment of Athena's court and legal process becomes the central event that propels the action toward the transfiguring harmonies of the play's close") – although he also notes that "[l]aw's image in the *Oresteia* gains its richness … from other features," Paul Gewirtz, *Aeschylus' Law*, 101 Harvard Law Review 1043, 1046 (1988): principally the notions that "retribution must play a central role in a system of criminal justice" (*id*. at 1047 – 1048), and that Aeschylus's law is "a highly gendered phenomenon" (*id*. at 1050) combining "female privilege *and* female subordination within the legal order" (*id*. at 1054). See also Burke at 383 – 385.

[4]David Cohen, *The Theodicy of Aeschylus: Justice and Tyranny in the* "*Oresteia*," 33 (number 2) Greece & Rome 129, at 129 (1986).

[5]Burke at 384.

[6]This satyr play is a low-budget production. It cannot give actors speaking parts when their roles, predetermined by proclivity or principle, will not affect the outcome or arouse dramatic interest. (Except Zeus.)

Hephaistos: Are those two interests identical?

AGA: Yes, in this case.

Zeus: Yes, always.

Hera: … except when a State's judiciary joins its convicts in foisting unwelcome decision making responsibility onto the federal courts.[7] We have enough to do.[8] Get on with it, Mr. Prosecutor.

AGA: Thus stands the case:

Orestes brutally murdered his mother, Clytemnestra. His sole theory of defense to the charge of matricide was that she had killed her husband and his father, Agamemnon. The case was initially tried before those ancient keepers of the peace, the Erinyes. They rejected the plea of justification. Orestes sought to upset their decision by petitioning Athena for a writ of *habeas corpus*. She not only accepted jurisdiction but made a novel, unprecedented ruling that Orestes was entitled to a jury trial by citizens of Athens. The jury divided, and Athena then cast the deciding vote herself, pursuant to the trial procedure she'd concocted. She acquitted Orestes and pensioned off the Erinyes, reducing their status and emoluments to those of retired adult probation officers. It is these unheard-of rulings that we ask this Court to review and reverse.

In a case of such importance, my clients are entitled to be represented by the most effective advocate they can retain. I therefore pray the Court to entertain a most unusual motion. I move the admission *pro hac vice* of the eminent American jurist Antonin Scalia – senior member of highest court in his nation – to serve as lead counsel for the prosecution here.

Hephaistos: You ask that Justice Scalia serve as chief prosecutor? What's so unusual about that?

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[7] *O'Sullivan v. Boerckel*, 526 U.S. 838 (1999). See *Coleman v. Thompson*, 501 U.S. 722, 738 – 739 (1991): "State courts presumably have a dignitary interest in seeing that their state law decisions are not ignored by a federal habeas court, but most of the price paid for federal review of state prisoner claims is paid by the State. … It is the State that pays the price in terms of the uncertainty and delay added to the enforcement of its criminal laws. It is the State that must retry the petitioner if the federal courts reverse his conviction. If a state court, in the course of disposing of cases on its overcrowded docket, neglects to provide a clear and express statement of procedural default, or is insufficiently motivated to do so, there is little the State can do about it."

[8] "Unless federal proceedings and relief – if they are to be had at all – are reserved for 'extraordinarily high' and 'truly persuasive demonstration[s] of "actual innocence"' that cannot be presented to state authorities … the federal courts will be deluged with frivolous claims of actual innocence." *Herrera v. Collins,* 506 U.S. 390, 426 (1993) (concurring opinion of Justice O'Connor).

AGA: Well, procedurally unusual, not substantively unusual. Yet even as a procedural matter, there are precedents. The present case follows *a fortiori* from Justice Jackson's appearance at Nuremberg. A jurist like Justice Scalia, who insists that history unequivocally resolves most issues, is surely entitled to return to the past and invent that history.

Hephaistos: Your professedly unusual motion sounds more and more like business as usual.

AGA: Precisely, Your Honor. It is really nothing more than a motion for a miniscule change of venue

Zeus: Motion granted. Justice Scalia will be seated at the prosecution table and may take the podium when he is ready.

Scalia: Thank you, Chief. I will argue three principal, vital points.

First, Orestes's savage crime of matricide cannot be justified as the fitting retribution for his mother's killing of his father. To accept such a justification would perpetuate a vicious cycle of private vengeance ultimately destructive of every vestige of law and order and public safety. Orestes murders Clytemnestra for murdering Agamemnon for murdering Iphigeneia, and they all escape blame by claiming to occupy the high ground in the seesaw of murders running back through Atreus and Thyestes and Pelops and Tantalus. Civilization can tolerate no claims of this sort. The power of life and death and the right to employ violence for correction or coercion must be placed firmly in the hands of government and nowhere else.

Second, Athena's arrogation of jurisdiction to review the Erinyes' condemnation of Orestes was unwarranted. Law, order, public safety all depend on the capacity of government to bring criminal predators to book promptly and decisively. In a federal system, responsibility for prescribing and enforcing the criminal law rests primarily with the constituent States, not the central government. When a State's authorized judicial agencies have rendered a judgment convicting an individual of a crime, that should be the end of the matter except in the very rare case in which one of those agencies has unmistakably disregarded an unequivocal, historically settled command of the central government's constitution. This is not such a case. Here, Athena had no cause or competence to interfere with the normal functioning of Argos's authorized criminal-justice adjudicators, the Erinyes.

Third, even if Athena were correct in ruling that she, as a central-government judge, has the power to review a criminal conviction rendered by the Erinyes and that the convicted defendant has, in addition, a right to jury trial in her court, these rulings cannot properly be applied retroactively to Orestes's case. Rulings creating

novel, unprecedented procedural rights for criminal defendants should be limited to prospective application, not used to upset criminal judgments wholly lawful at the time of their issuance.

Hera: Those are alternative submissions? You win the case if we agree with any one of them?

Scalia: Correct.

Hera: And Orestes then … ?

Scalia: is sent to hell.

Zeus: Excellent. Proceed.

Scalia: The first point requires little documentation. The disastrous consequences of private vengeance run amok have been illustrated and recognized time out of mind. Consider the cases of Titus Andronicus and Queen Tamora, of the Hatfields and McCoys, of Bugs Moran and Al Capone, of the Castellammarese War, of Danny Greene and the Cleveland Mafia, and of Mario Puzo's Godfather. Anarchy and chaos are the ever-present and most dangerous threats to civilized society. To guard against them, government must be given a monopoly of the authority to retaliate with violence. Muddleheads like Albert Camus and Arthur Koestler may claim that judicially-administered capital punishment is indifferentiable from premeditated brutal murder by a private individual. But there is all the difference in the world. Court-decreed executions express the orderly determinations of a State or nation and protect its citizens against victimization and the fear of victimization. Deliberated killings on the part of individuals, even with the noblest of motives, express only the perpetrator's idiosyncratic view of what is right or wrong; and the clashing of those views inevitably puts the fundamental fabric of the social order at intolerable risk.

My second point has to do with the proper allocation of authority among the governmental agencies of a federally-structured polity. The federal form of government characteristically distributes criminal law-making and law-enforcing competence between a central government and a constellation of regional or local governments. Not atypically, the regional or local governments are assigned primary responsibility for defining crimes, prescribing punishments, adjudicating criminal charges, and administering criminal sentences. This is the case in my country, which has a set of national institutions (usually denominated "federal") – the Congress of the United States, the President, and a several-tiered system of federal courts – alongside fifty regional ("state") governments, each having its own tripartite organization. It is also the case here, where the Olympian

Pantheon stands as your central governing authority, while your city-states retain predominant responsibility for the regulation of day-to-day public affairs, including the administration of their criminal laws through the Erinyes. Under each regime, the regional and local governmental agencies are subordinate to the central government within the latter's sphere, but that sphere is constitutionally limited. It includes guarantees of some protections that individual citizens can demand from their regional or local governmental agencies, but these central-constitutional protections are restricted to the few basic safeguards deemed indispensable wards against tyranny or gross autocratic oppression.

Under regimes of this sort, experience shows that criminals convicted by the regional courts will thereafter flock into the central courts claiming that some central-constitutional right or other was violated in the course of the regional-court proceedings. Usually, what's involved is simply that the convict is asking central-court judges to re-adjudicate issues of fact or law that the regional-court judges have already decided against him. Experience also shows, unhappily, that many central-court judges will accept the invitation to second-guess their regional-court counterparts and to upset convictions or set aside sentences as violative of central-constitutional rights which the regional-court judges had maturely considered and held to be inapplicable or fully satisfied. This relitigation sequence delays the execution of criminal judgments and undermines the finality which they must have if they are to fulfill their retributive, rehabilitative and monitory objectives. It squanders the resources of both the central courts and the regional courts, and it disparages and discourages the regional-court judiciaries. To avoid these debilitating consequences, our legal system in the United States has developed a rule of "comity" or "deference" which forbids central-court judges upsetting the decisions of regional-court judges that they think merely erroneous. The comity/deference rule was initially developed by the United States Supreme Court and was strengthened through a statute enacted by Congress in 1996 entitled The Antiterrorism and Effective Death Penalty Act. The relevant section of that statute (colloquially called "section 2254(d)") now provides – as interpreted by our Supreme Court – that federal judges entertaining a petition for *habeas corpus* filed by a state-convicted criminal may not set aside any legal or factual ruling of the state convicting court unless that ruling is not simply incorrect but unreasonably incorrect in its rejection of the petitioner's federal constitutional claims.

America's lesson is that a stringent rule of deference to the decisions of the front-line judicial decisionmaker in a criminal case is indispensable to prevent relitigation from degenerating into an unseemly, costly and subversive free-for-all. In finding facts and in construing and applying legal rules, Johnny-On-the Spot is every bit as likely to be right as any backward-looking Johnny-Come-Lately of a *habeas corpus* judge. And when the closure of a case of crime is endlessly delayed, irreparable harm is done to victims of that crime and their survivors, to the public confidence in law, and to the criminal's ability to come to terms with his own guilt and expiate it.

Chorus: How unrelentingly and ruthlessly
This jurist's reasoning persuades us!
Habeas corpus writs will uselessly
destroy Law's Certainty and cause outrageous
loss of public faith in Justice. Heavens save us
from the most unsettling stroke the Moirai gave us
since TV's *Sopranos* ended inconclusively.

Scalia: The only half-way tenable justification asserted for federal or Olympian review of state or regional judicial judgments is that state and regional judges cannot be trusted to be scrupulous in enforcing rights which the federal and Olympian constitutions guarantee that individuals will enjoy in state and regional criminal prosecutions. There is no objective factual basis for this distrust in general;[9] and in Orestes's case the Erinyes adhered strictly to the time-honored code they were duty-bound to follow. Athena had no cause to disregard their judgment and substitute her own.

My third point, having to do with retroactivity, is also one that draws illumination from the extensive experience of the Supreme Court of the United States. Our Court has found that on occasion there is need to change longstanding constitutional rules, but that changes which expand the rights of criminal defendants would impose extremely heavy costs on state and federal governments if applied so as to upset previous criminal convictions or sentences and require the release or retrial of the convicts. To ameliorate these costs and to free itself from their disincentive influence, the Court has experimented with various doctrines that allow it to announce new rules having only prospective application. The doctrine which has emerged as best suited for use in *habeas corpus* and other

[9]See, *e.g., Swain v. Pressley*, 430 U.S. 372, 383 (1977), expressing "the settled view that elected judges of our state courts are fully competent to decide federal constitutional issues, and that their decisions must be respected by federal district judges in processing habeas corpus applications."

postconviction proceedings was articulated in the now-leading case of *Teague v. Lane*.[10]

Essentially, *Teague* holds that when the Court announces a new constitutional rule favoring criminal defendants, the rights provided by that rule accrue only to defendants whose convictions and sentences have not yet become final. *Teague* recognizes two very limited exceptions to this rule of nonretroactivity. Previously convicted defendants will be given the benefit of the new rule only when (1) the change in law is *substantive*, in the sense that it wholly denies government the power to criminally punish the kind of conduct for which the defendant was convicted (or to punish that kind of conduct with the particular sentence he was given and now challenges), or (2) the change in law establishes a new *procedural* protection which is deemed to be within the "extremely narrow" class of "'"watershed rules of criminal procedure" implicating the fundamental fairness and accuracy of the criminal proceeding'" in the sense that they are necessary in order to correct a prior mode of procedure which "so '*seriously* diminishe[s]' accuracy that there is an '"impermissibly large risk"' of punishing conduct the law does not reach."[11]

The unprecedented rights announced by Athena in Orestes's case are procedural, not substantive; and, even assuming *arguendo* that they amount to an Olympian "watershed," they are indisputably not necessary to ensure against a serious risk of inaccurate convictions.[12] Whether or not such rights should be recognized in future prosecutions, they can provide no basis for retroactively upsetting Orestes's conviction.

Hera: You dismiss the right to jury trial more blithely than I had anticipated. In your published opinions, you appear to prize that right excessively.

Scalia: I prize it highly. But the right to jury trial is a uniquely Anglo-American institution. It would impermissibly denigrate American exceptionalism if the right were recognized by alien judicial systems.

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[10]489 U.S. 288 (1989).

[11]*Schriro v. Summerlin*, 542 U.S. 348, 352, 355 – 356 (2004).

[12]The U.S. Supreme Court has repeatedly held that its decisions announcing new rights to jury trial are nonretroactive because "'"[w]e would not assert … that every criminal trial – or any particular trial – held before a judge alone is unfair or that a defendant may never be as fairly treated by a judge as he would be by a jury."'" *Summerlin*, 542 U.S. at 357, quoting *DeStefano v. Woods*, 392 U.S. 631, 633 – 634 (1968). And it has repeatedly asserted that due process "certainly does not establish any right to collaterally attack a final judgment of conviction." *United States v. MacCollom*, 426 U.S. 317, 323 (1976); see *Pennsylvania v. Finley*, 481 U.S. 551, 557 (1987); *Murray v. Giarratano*, 492 U.S. 1, 8, 13 (1989).

Hera: You are not very tactful, counsel.

Chorus:
Tact's a virtue seldom learned
if one knows one is very smart
and has a stash of four or more unearned
concurring votes in almost every case to start.

Zeus: Come, Hera! Don't let counsel's lack of courtesy enrage you. His points are all well taken though curmudgeonly articulated.

Chorus:
One needs to be an utter fool
to fail to see
the way the Chief is bound to rule.
The irony
is that Scalia's clinching
argument for the superiority
of judges' judgments over passion-blinded
private lynching
is that judges will be open-minded.

Zeus: Well, let us hear from Bruner now.

Bruner: May it please the Court: The three issues posited by Mr. Scalia are not as separable as he would make them seem. They are facets of the same deep question: To what extent, as we mature, are we obliged to re-interrogate the actions we have taken and the judgments we have made in earlier years, to come to terms with wrongs committed by our younger selves? All of us – individuals, families, governmental functionaries, governments themselves, societies, their judges and their Gods – reside in Time and will invariably change their characters and values. When things that they have done in former days continue to affect the world, how much are they required to acknowledge past mistakes and sins and to atone for them?

My submission is this: The human condition is that we are fated sometimes to do wrong; we are usually incapable at that time of appreciating it is wrong; we are capable of appreciating after the fact that we have done wrong; and we are powerfully tempted to deny it. Succumbing to that denial is the ultimate injustice, inhumanity, and evil.[13] Insofar as Gods interact with humans over Time, they are susceptible to the same frailty and temptation and are subject to the same ultimate judgment

That is the lesson of our *Oresteia*. Consider Agamemnon, with whose deeds our tale begins. Supreme Commander of an army

[13] *Cf.* Martha C. Nussbaum, The Fragility of Goodness: Luck and Ethics in Greek Tragedy and Philosophy 5 – 7, 25 – 50 (Cambridge University Press 1986) [hereafter, Nussbaum].

called to war, he finds his forces stranded on the sterile shore at Aulis, unable to take ship for lack of favoring winds, and imminently threatened with disintegration. He learns that he can raise a wind only by the blood sacrifice of his daughter, Iphigeneia. This forces him to do one evil act or another: – to violate his duty as a father or to violate his duty as a General.[14] This is the, uh, classic illustration of the human plight, a plight shared by any less-than-omnipotent species of Gods. We are all entangled in a complex web of roles, relationships, allegiances, and consequently obligations that will sometimes require us to do wrong according to the code prescribed for one of our roles in order to fulfill our duties under the code prescribed for another of our roles. We cannot avoid performing an act that is wrong by the standards of one of the codes we are bound to obey; our only choice is which wrong act we will do.[15]

Agamemnon chooses to purchase his army's passage to Troy by butchering Iphigeneia. This is well warranted – indeed, selflessly heroic – for as long as military conflict is the order of the day. So Agamemnon wins his war. But when he returns victorious to his role as a family man, the wrong he did to his daughter must be recognized and expiated. Clytemnestra does that work by butchering him in turn.

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[14]"[T]he king spoke up. He swallowed his grief / and said, 'It is bitter, bitter, being the chief. / To slay my own little girl? With my hand to pour / her virgin's blood on an altar and go to war? / And yet, if I fail / we shall never sail / to Troy, as we have pledged to each other to do, / and I shall dishonor myself and each of you.'" David R. Slavitt, ed. & trans., Aeschylus, 1: The Oresteia, *Agamemnon* (University of Pennsylvania Press 1998) [hereafter, *Agamemnon*], lines 157 – 164.

[15]See, *e.g.,* Benjamin Apthorp Gould Fuller, *The Conflict of Moral Obligation in the Trilogy of Aeschylus*, 8 (number 4) Harvard Theological Review 459, 476 (1915) [hereafter, Fuller]; N. G. L. Hammond, *Personal Freedom and its Limitations in the Oresteia*, 85 Journal of Hellenic Studies 42, 47 – 48 (1965); Hugh Lloyd-Jones, *The Guilt of Agamemnon*, 12 (number 2) The Classical Quarterly, New Series 187, 190 – 197 (1962). The problem of having to choose between doing one or the other of two evil acts is different than the problem of having to choose between doing acts that will cause one or the other of two evil consequences. In the latter situation, a hedonic calculus can resolve the problem and produce an equation that will prove the choice right. In the former situation, whichever choice one makes leaves one having *done* an evil act. For human beings and for non-omnipotent Gods, there are some acts that are self-evidently and innately evil, without regard to their consequences. Consideration of their consequences may make them *necessary* evils or may make them *aggravated* evils, but they remain evil acts in themselves. The roster of inherently evil acts doubtless does not coincide precisely with those that Anglo-American law has, at any given time, classified as *malum in se*, but the pervasive recognition of the *malum-in-se* concept attests to the strength of our moral need to recognize that some such roster has meaning. For purposes of this case, there is no need to explore the outer reaches of the roster. It suffices to recognize that the killing of a human being and the extended physical confinement of a human being are inherently evil acts.

She, of course, is in the self-same sort of bind: – kill her husband, the king, or condone the killing of her daughter.[16] And so Orestes in his turn can only choose between the crime of matricide and the crime of abjuring his duty as his father's son.[17]

This much is obvious. But see what follows. The Erinyes are rudely wakened by the shrieks of Clytemnestra's Shade, "But where is justice?"[18] and they cannot then escape their own plight with its choice of evils: – to excuse a mother's murder or ignore a father's.[19] Then it is Athena's turn. She must decide whether to permit perpetuation of the savage cycle of revenge and violence endorsed by the Erinyes or to shred the fabric of the settled social order which their judgment upheld. Both Orestes and the Erinyes invoke "justice" in their pleas to her.[20] She, like each of the parties before her, must embrace one or the other of two schemes that justify killing.

Hephaistos: Surely you misrepresent Athena's situation as requiring her to do one evil act or another. She can simply abstain from acting at all – let events take their course, let the judgment of the Erinyes stand undisturbed, as Mr. Scalia has argued.

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[16]"SECOND CHORISTER: You've killed the king! / You've murdered your husband! What are we in the city to make of this? And what can happen now? / People will hate you! Fear you! What is your plan / now? Are you going off somewhere into exile?"

"CLYTEMNESTRA: Whatever for? You threaten *me* with exile? / You talk to me, now, of the people's hatred? / What about then? What about him? What hatred / did any of you have for a man like that / who killed his own daughter? A sacrifice! / He couldn't find a sheep? So he kills his child? / My child! From out of my body! He couldn't wait / for the goddamned winds to shift for his ships to sail on?" *AGAMEMNON*, lines 1185 – 1197.

See Fuller at 467: "The murder of Agamemnon by Clytemnestra is presented as the outcome of a more acute and at the same time more evenly balanced conflict of obligations than that which actuates the sacrifice of Iphigeneia. … The Greek audience did not need instruction in the duties owed a husband by his wife."

[17]See, *e.g.,* KUHNS at 31.

[18]DAVID R. SLAVITT, ed. & trans., AESCHYLUS, 1: THE ORESTEIA, *THE EUMENIDES* (University of Pennsylvania Press 1998) [hereafter, *THE EUMENIDES*], line 90.

[19]The Erinyes are not simply hounds or simply prosecutors. That their form of justice "was a partial justice … does not cancel or destroy the fact that it was justice, because it followed an inflexible rule, a rigid application of principle, limited though that principle might be from the standpoint of a broader principle." OTIS at 92.

[20]Orestes: "I invoke … Athena. She will defend me, not with the spear she can wield but reasoned justice." *THE EUMENIDES*, lines 255 – 256. First Fury: "And we come for justice, to assert our legitimate claim. … We punish murder. And drive away all those who commit this crime." *Id.* at lines 370 – 372.

Bruner: Athena's options are no different than the Erinyes', or Orestes's, or Clytemnestra's. You might say of any of the actors on our stage that they could choose to take no part in the play. But each of them understood that they would be doing a wrong act by refusing to act in a situation where the refusal amounted to condoning homicide.[21] The distinction between "action" and "inaction" is always tenuous, and all the more so when a controversy has reached the appellate stages of litigation. Is an appellate court any more inactive when it affirms a lower-court decision imposing a death sentence than when it reverses a lower-court decision vacating a death sentence?

Hephaistos: What you call "condoning" homicide is still a far cry from the wrongful act of *committing* homicide. To accept or even to approve a situation in which somebody else has committed a killing does not make anyone guilty as an accessory after the fact, let alone as an aider and abettor of homicide.

Bruner: The Erinyes themselves understood that to take a pass in Orestes's case would be to license behavior like Orestes's in other cases.[22] And Athena understood that by leaving the Erinyes' judgment in place, she would be authorizing them to continue to render such judgments.[23] She explicitly withdrew that authority from them for the future by removing them from judicial office.

Hephaistos: I simply cannot see the parallel between a judge's choosing which way to rule in a case that is before him for decision and a private individual's choosing a course of action. The judge is neutral, has no stake in the outcome. Having jurisdiction, he is bound to rule for one party – one position, one outcome, one legal doctrine – or the opposing one. This isn't a posture in which both choices are wrong. It is a posture in which either choice is right if the judge makes it disinterestedly.

Bruner: It's true that when a court's jurisdiction is mandatory, the judge or judges must rule for one side or the other. (That's not so, of course, in courts like your Olympian Pantheon or the Supreme Court of the

[21]Electra, imploring Zeus to intervene, says: "If you withdraw from the business of mankind, / men will diminish, but gods will do so too." David R. Slavitt, ed. & trans., Aeschylus, 1: The Oresteia, *The Libation Bearers* (University of Pennsylvania Press 1998) [hereafter, *The Libation Bearers*], lines 237 – 238.

[22]"Who will call on us now in their righteous anger? / … What fear will … [mere] judicial bodies inspire / in evil men to stay their hands? Through awe / have we maintained the world's fundamental law." *The Eumenides*, lines 449 – 456.

[23]Her situation is "an inversion of the original dilemma" of Orestes. "He by a refusal, she by a willingness, to take sides would be committed to the same morally indefensible partisanship." Fuller at 476. Orestes says: "[I]f I did nothing, / if I failed to act, then I should share in the evil." *The Libation Bearers*, lines 914 – 915.

United States, whose jurisdictions are almost entirely discretionary.[24]) But even when a judge is legally obliged to rule, the notion that his or her ruling is disinterested is rather a, uh, myth. The Erinyes' judgment is driven by their passionate need to preserve their ancient prerogatives and pride of place as the ultimate enforcers of Right.[25] Athena makes no bones about her own interest in establishing herself as the founder of a new, enlightened regime of justice.[26] Judges' self-image and commitment to the posture in which they want their portraits painted for posterity are as compellingly egoistic as any other human motives.

Hera: Really! Your tactlessness exceeds even your opponent's!

Chorus:

He's always treated us with tact
and courtesy and modesty. But it's a fact
he's never – either in or outside of the ivory tower –
failed to speak the truth to power.
Poor Hera! Now she's really frantic
She prefers her lawyers sycophantic.

Bruner: All the players on our stage are similarly placed in situations where they must do some wrong act. The difference lies in their reactions to this common plight. Agamemnon feels some qualms of conscience but represses them insistently, claiming to himself and others that he's acted altogether rightly.[27] Clytemnestra never, for one moment, lets herself suspect the wrongness of her actions.[28] Nor do the Erinyes.[29] They are in denial. Orestes, by contrast, recognizes that in killing Clytemnestra he did something that was wrong according to one applicable code of conduct although right according to another. He is tormented by his guilt and understands he

[24]28 U.S.C. §§ 1254, 1257; United States Supreme Court Rule 10. See, *e.g.,* Margaret Meriwether Cordray & Richard Cordray, *Strategy in Supreme Court Case Selection: The Relationship between Certiorari and the Merits*, 69 Ohio State Law Journal 1 (2008).

[25]"This is our purpose. For this we were made / and are authorized, and no gods can interfere. / We are sovereign here." *The Eumenides*, lines 333 – 336.

[26]"I will convene a tribunal on Ares' rock / to endure through the ages, the Areopagitic / Court, where we may arrive together at justice." *The Eumenides*, lines 430 – 432. And see *id*. at lines 613 – 618.

[27]See Nussbaum at 32 – 47.

[28]"I killed him, / struck him down. I don't deny it! I'm proud / of what I've done!" *Agamemnon*, lines 1154 – 1156. The chorus describes her as "crowing aloud in her pride." *Id*. at line 1240. See also *The Libation Bearers,* lines 671 – 672.

[29]"Our vengeance is heaven sent." *The Eumenides*, line 314. "[W]e are steadfast and stern as we protect / and maintain the laws of heaven. This is our great / delight and the duty to which we are called by Fate." *Id*. at lines 352 – 354.

needs to expiate it.[30] Athena, too, understands that she must make amends for the wrong she's done to the Erinyes; this is why she offers them "a seat of honor"[31] and acknowledges that "We are none of us sovereign, none but Zeus. The rest / must learn somehow to adapt and get along, to yield to greater force … ."[32]

With these differences in focus, let me address each of Mr. Scalia's three points.

First, regarding Orestes's culpability: My case for his exoneration does not assert his innocence. His act of matricide was wrong. He admits this and is conscience-stricken. What entitles him to be acquitted is precisely that. He comes before you with the decency and courage to declare: "I killed my mother, and I do not claim that doing so was other than an evil action, however much it may have been a necessary evil or a lesser evil. I seek no solace in denial or hypocrisy, only judgment for an admittedly wrongful deed."

Second, regarding the respect due to the Erinyes' decision: They, unlike Orestes, claim that they have acted wholly rightly. Self-satisfied, self-righteous, confident in the correctness of their standards for judging and in the acuity of their ability to judge, they are immune against self-correction. That is why their role in the scheme of things is tolerable only if their judgments are subject to external review.

Hephaistos: All judges must maintain enough self-confidence to survive the stress of judging. Academics and playwrights can indulge in endless self-examination because they do not have to live with knowing that their judgments expose vital social institutions to destructive damage and condemn real people to deprivation and suffering and death. Judges can dither and debate and doubt their own capacity only up to the cusp of decision. Then they must pronounce judgment and move on. Judgment rendered, they are committed to a posture of infallibility whether or not they think themselves subjectively infallible.

The question, then, is *which judges* should be shouldered with the burden of infallibility? In a federal system such as ours, the courts of

[30] "[T]here now is guilt, / but I shall contrive somehow to live with that." *The Libation Bearers,* lines 897 – 898; and see *id*. at lines 393 – 394, 831 – 833. "For what I suffer, / there is no recommended therapy or treatment. / What I feel is … giddy, with joy and horror dancing together. / … and it's hard to speak, or breathe, or even think … / But the one thought I cling to is that what I did / was necessary and right." *Id*. at lines 903 – 909. "Apollo commanded / that I should do this thing. He and I together / are answerable jointly for what I did. / Justified or not – I leave that to you. Whichever way you decide, I accept your verdict." *The Eumenides,* lines 412 – 416.

[31] *The Eumenides*, line 685.

[32] *The Eumenides*, lines 699 – 701.

the central government are rightly obliged to accord great deference to the rulings of the constituent state judiciaries, even in regard to rights guaranteed by the central government's constitution. Central-court judges cannot go about upsetting state-court decisions simply because they believe the judgments erroneous; they can intervene only when the state court's judgment is "objectively unreasonable."[33]

Bruner: I am aware that that is the rule prescribed by Congress for federal habeas corpus review of state criminal convictions in the United States. I'm also aware that the United States Supreme Court has never deigned to address a reasoned opinion to the question whether this statute is consistent with the Judiciary Article or with the Supremacy Clause of the U.S. Constitution. A rule of questionable constitutionality[34] that has been enforced by a Court persistently dodging that question is hardly a commodity suitable for export.

Hephaistos: Congress simply accepted Chief Justice Zeus's urgent invitation to restrict federal habeas review in the 1996 statute you are talking about. Even before the enactment of the statute, the U.S. Supreme Court had established its own principle of deference to state-court judgments regarding federal constitutional rights in state criminal cases; and even today the Court glides smoothly from deferent decisions under the statute to deferent decisions in cases where the statute is inapplicable by its explicit terms.[35] Can't you understand how really peeved we get when bumptious federal judges like Athena disregard our repeated admonitions to defer, defer, defer?[36]

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[33]"Federal habeas relief may not be granted for claims subject to § 2254(d) unless it is shown that the earlier state court's decision … 'involved an unreasonable application of' [federal] … law"; "'an *unreasonable* application of federal law is different from an *incorrect* application of federal law.'" *Harrington v. Richter*, 562 U.S. 86, 100-101 (2011). See, *e.g., Yarborough v. Alvarado*, 541 U.S. 652, 665 (2004); *Lockyer v. Andrade*, 538 U.S. 63, 75 – 76 (2003): "It is not enough that a federal habeas court, in its 'independent review of the legal question,' is left with a '"firm conviction"' that the state court was '"erroneous."'"

[34]See James S. Liebman & William F. Ryan, "*Some Effectual Power*": *The Quantity and Quality of Decisionmaking Required of Article III Courts*, 98 Columbia Law Review 696 (1998). Zeus's decree in *Felker v. Turpin*, 518 U.S. 651, 663 – 664 (1996), is cavalier, if not disingenuous.

[35]See *Ayers v. Belmontes*, 549 U.S. 7 (2006).

[36]"The writ of habeas corpus stands as a safeguard against imprisonment of those held in violation of the law. Judges must be vigilant and independent in reviewing petitions for the writ, a commitment that entails substantial judicial resources. Those resources are diminished and misspent, however, and confidence in the writ and the law it vindicates undermined, if there is judicial disregard for the sound and established principles that inform its proper issuance. That judicial disregard is inherent in the opinion of the Court of Appeals for the Ninth Circuit here under review. The Court of Appeals, in disagreement with the contrary conclusions of the Supreme Court of the State of California and of a United States District Court, … set aside the conviction of Joshua Richter … . This was clear error." *Richter*, 562 U.S. at 91-92.

Bruner: I understand your impatience.[37] But its very intensity might well suggest to introspection that judicial judgment is not always as dispassionate and disinterested as Your Honor's earlier observations made it seem.[38]

Hera: Will counsel's insolence never cease?

Chorus:
Inviting Hephaistos
to engage in introspection
could be horribly disastros.
Who can guess in what direction
This will take us? Jerry! shoot!
We really should have held a moot.

Hephaistos: Say again?

All players freeze excepting Hephaistos and Bruner. Pause. The stage goes dark. Again a pause. Spotlights now on Hephaistos and Bruner. Elsewhere, blackness.

Bruner:
Canny Hephaistos, can we draw apart
and speak with one another heart to heart
albeit briefly? Put aside
the game of smoke and mirrors where we hide
our deeper intuitions from the crowd?
Though there be things we cannot say aloud
lest law's authority be cast in doubt,
can we not ferret out
some little private stage
to share our honest thoughts that would enrage
proud Hera? Always resolutely to conceal
the doubts we cannot help but feel
about the rightness of the rulings that we make –
repressing all suspicion of mistake –
may seem to be a necessary course
to give those rulings necessary force.
But in the end that seeming-necessary tool
turns traitor and enables us to fool
ourselves as much as others and to lose
the light that conscience casts upon the paths we choose.

Hephaistos: Go on. I'm listening.

[37] *Cf.* The Eumenides, lines 716 – 718.

[38] *Cf.* Anthony G. Amsterdam, *Selling a Quick Fix for Boot Hill: The Myth of Justice Delayed in Death Cases*, in Austin Sarat, ed., The Killing State: Capital Punishment in Law, Politics and Culture 148, 157 – 158 (1999).

Bruner: Then let me ask
that you take on the heavy task
of questioning what underlies
the rule of deference you prize
so highly. Of the Gods on High Olympus
from the wisest to the simplest,
you can bring to that inquiry
keenest insight. Hephaistos, fiery
forger, artificer, craftsman, innovator!
In your genius as creator
You can find the surest clue.
(And haven't you been a law-school teacher too?)

Hephaistos: McGeorge. And still part-time.

Bruner: Part-time's enough
to start subjecting all this legal stuff
to testing. When your students ask *How come?*
You can't forever play it dumb.

Hephaistos: My law clerks ask *How come*.

Bruner: I doubt it.
They're more like to ask *How go about it*,
To produce the answer that the Justice seeks?
You've picked your law clerks; they're your geeks.
Your chambers that they live in
have a special ecosystem driven
by a set of expectations
bred through generations
leading them to think they know
where you're going long before you tell them so.

That point, indeed, is at the pith
of this whole deference business with
its notion that decisions made by courts
can be examined through the sorts
of processes implied by asking if a judge's ruling
is "objectively unreasonable." We're fooling
no one but ourselves if we suppose
that anything "objective" goes
into decisions which adjudicate
a criminal defendant's fate.
What "facts" are "found" or rules "applied"
depend on whether judges side
with sets of values and proprieties
that saturate one niche in our society's

complex divisions or another. Faction
almost always calls the action,
and a local culture's anti-centrist tilt
can make uncertain evidence and laws add up to guilt.
Your "not unreasonable" test for deference
especially makes little sense
because it gives the local judges freest rein
in cases where the law's less plain[39] –
the very cases where a local judge's eye is
maximally likely to be skewed by local bias.

Hephaistos: So federal judges will more faithfully enforce
our federal rights? That's Madison of course,
enhanced by Clifford Geertz. I really ought
to give this subject further thought.

All stage lights go on. All players reanimate. Hephaistos appears pensive.

Chorus: Look at Hephaistos! Bravo, Jerry!
Something you have done has made him worry!

Bruner: Mr. Scalia's third submission – nonretroactivity – needs not detain us overlong. There's nothing to it.

Hera: Nothing? *Teague v. Lane* is *nothing*? Twenty opinions of the United States Supreme Court during the quarter-century since *Teague* was handed down – every one of them endorsing *Teague* and applying *Teague* to hold that virtually all newly-announced constitutional rights of criminal defendants are nonretroactive – this entire body of case law is ***nothing***? Go to any law school, talk to any criminal-procedure student, pick up any criminal-procedure casebook, look in any criminal-procedure treatise! What could be more widely known and understood than the rule of *Teague v. Lane*? *Teague* establishes that new substantive rules require the invalidation of pre-existing convictions but that new procedural safeguards, such as those Athena announced in your client's case, apply only prospectively and afford no basis for upsetting earlier criminal judgments. No legal doctrine is more firmly settled, more familiar than this one!

Bruner: Familiar to be sure, but just as surely strange.[40] *Teague* purports to provide a rule for adjudicating claims under the Constitution of the

[39] "[E]valuating whether a rule application was unreasonable requires considering the rule's specificity. The more general the rule, the more leeway courts have in reaching outcomes in case-by-case determinations." *Yarborough*, 541 U.S. at 664.

[40] See Anthony G. Amsterdam & Jerome Bruner, Minding the Law 1 (Harvard University Press 2000) [hereafter, Minding the Law].

United States and for determining the extent to which those claims, when valid, will be enforced. Yet its holding gives pride of place to concern about the substantive culpability *vel non* of a convicted criminal defendant – whether the acts for which s/he was convicted were punishable, and whether s/he is highly likely to be innocent of having done those acts – and it commensurately disparages the procedural concern whether the defendant's case was processed consistently with constitutionally requisite due process. How does this focus of concerns fit together with the equally familiar axiom – which the United States Supreme Court has repeatedly declared in every other context – that the protections which the federal Constitution accords to state criminal defendants are purely procedural, and that the questions of what behavior should be criminalized and of whether the defendant is innocent or guilty of state-proscribed behavior are exclusively within the province of the individual States?

But still more basically, *Teague* is simply wrong. It represents the ancient sin of Agamemnon and of Clytemnestra rattling blindly down the ages. "Never look back. Never admit the errors of your earlier years. Insist that what you would not do today was A-Okay throughout the time you did it. Reform without repenting. Be wiser but not sadder. Buy your new-found wisdom with the lives of all the men and women who remain walled up in prisons or are stabbed to death with poisoned needles while you blithely go your way. Why stop to give them aid when you have run them over? They are roadkill, after all." *Teague* has all the moral virtue of a hit-run driver.

Hera: You fault us for reforming? Blame us by the standards of our own enlightenment? We would do better in the future not to change old rules at all.

Chorus: That threat's perverse.
A curse.
Yet worse:
Indecent.
It's the whimper of a peevish adolescent.

Bruner: Adolescents can grow up. There may yet come a day
When *Teague* itself will pass away.
So let the curtain fall now on our play,
and we'll adjourn
to court to see what's there for us to learn.[41]

[41] See Minding the Law at 357, note 7.

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Part III
Conclusion

Cultivating Possibilities for Cultural Psychology. Jerome Bruner in His Becoming

Giuseppina Marsico

One of the thing I have learnt from Jerry is that nobody gets interested and spend months, years, decades, investigating a phenomenon unless it resonates somehow in the personal life. This is even more evident for the social scientists in general and for the psychologists in particular, whose topic of interest (i.e. the psychological functioning) and means of investigation coincide. Jerry is an adamant example of the integration of personal and scientific trajectory. As Jerry himself tells in the interview (Marsico, this volume), his constructivist perspective on human beings might be seen as the result of his early blindness until the age of two and half and of some later events in his life as, for instance, the intellectually very stimulating friendship with Jean-Paul Sartre in Paris during the Second World War. In the same vein, Jerry always encourages the young scholars to find their own path in the psychological investigations (Valsiner, this volume) and even their personal way of writing. Once, in commenting one of my manuscripts he wrote: "….*I lose your voice. I think you need to use a less complicated, "personal" mode of writing. More Pina Marsico. More "literary"*…. J. Bruner, personal communication, 13th January 2011. How to find our own intellectual co-ordinates, our style and our identity as researchers? After all, the specific portion of reality, the event or the object in which we are interested is part of the same culturally constructed reality where we live, move, act, reflect. But the scientific investigation takes place in the actual world to open up new possibilities, going beyond the given information. For doing that Jerry suggests to follow the intuition (Linaza, this volume) that will be, then, servant of the rigorous research. As Valsiner pointed out: "*There are many layers of personal-cultural needs that turn an ordinary person into a*

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scientist. Here, the scientist and artist function similarly—the emergence of an idea is hidden somewhere in the internal infinity of our mind" (Valsiner 2014a, p. 13). Yet, intuition is not pure or naïve, but it is educated trough the social practices of science. Educated intuition is the starting point of a methodology cycle (Branco and Valsiner 1997) that allows a systemic look to the elements in place (Basic Assumptions, Phenomena, Theory, Method Construction) and their mutual relationship, and drives the investigation of a psychologically relevant phenomenon towards the elaboration of a general theory. This has been the scientific *habitus* of Jerry Bruner all along his career, always interested in grasping the complex relationship of the human *psyche* with the socio cultural context. This holistic approach is the very core of the cultural psychology perspective that, in fact, has nothing to do with the fragmentation of the current research in psychology, mostly focused on "discrete elements of a phenomena" or only "a portion of a behavior" (Marsico 2015b). Cultural psychology, instead, deals with the goal-oriented and meaningful human conduct (Valsiner, this volume; Harré this volume) which is hardly modeled by standardized methods, but that is intelligible troughs narratives (Daiute, this volume) from which the cultural nature of meanings emerges.

Cultural Psychology: Back to the Future

Jerome Bruner has had a leading role in the contemporary attempt to reintroduce the notion of culture into the psychological realm. Looking back at the history of psychology this is the third effort in this direction. The first two were the Wundt's, Steinthal's and Lazarus' versions of *Völkerpsychologie* at the end of the 19th century, and the *Culture and Personality School* of the 1950s. Both failed to create a new synthetic science: the former because it was "parallel to" instead of "jointed with" the experimental psychology and the latter because was crushed between the Behaviorism's fortress and the incoming rampant cognitive bastion (Valsiner 2004; Marsico 2015b).

Jerry has been at the forefront of this current scientific enterprise that runs under the label of cultural psychology, largely contributing to its two main investigative axes: the topic of culture in human development and the dynamic of social discourses of ordinary people in their culturally organized contexts.

Cultural psychology pays attention to the interconnection between mental processes and cultural and contextual dimensions. Its objects of study are the higher psychological functions and the mechanisms through which individuals form their minds and attribute meanings to their lives and to the world surrounding them.

Cultural psychology presents, therefore, the human *psyche* in a constructive-contextualized key, far from any intercultural comparison. Culture is neither a dependent nor an independent variable (Anandalakshmy 1974), but "*a label that denotes the systemic organization of the semiotic and historical nature of human psychological processes in their wide-ranging manifestation*" (Valsiner 1995, p. 7).

Human beings develop their psychological functions by participating to the culture and, in doing that, they simultaneously create culture: a feed-forward loop that produces both individual and socio-cultural growth. This theoretical orientation finds its finest expression in the later Bruner's works (Bruner 1990, 1996, 2002, 2004), where it is possible to indentify the inherent *polygenic* nature of cultural psychology. Bruner dialogues with the phenomenology of Schutz (1962), the ethnomethodology of Garfinkel (1967), the symbolic interactionism of Mead (1934) and Goffman (1969), and the interpretive anthropology of Geertz (1983). The phenomenological approach allows Bruner to emphasize the role of subjectivity in the daily life. The ethnomethodology offers him further epistemological and methodological tools for a deep analysis of the meaning–making process in a specific socio-cultural context. Thanks to the influence of the symbolic interactionism, Bruner further elaborates the mechanisms through which meanings are constructed, shared and negotiated. Finally, the interpretive anthropology allows Bruner to consider the culture and the relation between mind and culture as an ambiguous text to interpret.

Cultural psychology is interdisciplinary in its core. Any attempt to focus on a complex issue like culture in psychology requires an interdisciplinary integration between social sciences and a general historical orientation. But cultural psychology is also intrinsically developmental. It is a developmental science in its nature since it assumes that all the human beings (as well as groups, social institutions, communities) are developing dynamic systems constantly striving for the new. The focus of investigation are thus the circumstances under which novel organizational forms emerge (Marsico 2015b).

The intellectual program initialed by Jerome Bruner needs to be further developed. What is required is to make an effort in understanding the functioning of culture in the psychological processes.

Advance in Cultural Psychology: Cultivating Future Possibilities

The previous pages and the entire Bruner's *cursus honorum* shows the impressive number of different fields he covered along his notable carrier and to which he always contributed in a original way. But beyond all these various areas of investigations in Jerry's inquisitive mind, since the very beginning there were- and still are- three main questions: "*What makes human beings human? How did they get to be that way? How can you be more so?*" (Gardner, this volume). This is the very core of cultural psychology! The fundamental issues of who we are as humans and how we become humans imply a holistic approach to the *psyche* in its complexity (Valsiner 2014b). The legacy of Jerry Bruner is taken over by those scholars that are working in turning psychology into a science of the human ways of being. Being is not a merely ontological state, but refers to the *process*

of existing that entails the construction of the human world (Valsiner et al. 2016). Cultural psychology, thus, is the science of the *human* nature and of the specifically human ways of existence that starts from the phenomena of higher psychological functions, and look at how their lower counterparts are re-organized from above. Cultural psychology "cultivates new possibilities" for studying behavior or cognition, by looking at normativity and narrative dialogicality of higher psychological functions in multiple forms and arenas of human activities, including those specific fields suggested by some of the authors of this book (see, for instance, what Ruiz Pérez and Linaza say about skill development and Gómez argues about the importance of play during the childhood).

The human psyche is goals-oriented, operates on the borders between past and future, and unites personal and social sides of its development through various aspects of culture. As Bruner has pointed out in the interview (Marsico, this volume), psychology necessarily deals with conflicting, unpredictable and ambiguous situations. Thus, human dilemmas are, heuristically speaking, the most fitting phenomena to investigate. These dilemmas challenge the culturally established set of meaning, making possible the emergence of the novelty. The borders between *actual and possible worlds* are at stake here and acquire an epistemological and methodological relevance in our globalizing societies, where the social practices of borders construction and re-construction (Marsico 2015a; Marsico and Varzi 2016) and the cultural organization of borders within educational settings (Marsico et al. 2015) have profound implications on how we can *become more human,* cultivating new developing possibilities for the next generations.

Once again Bruner's ideas are feeding this new frontier of cultural psychology. Jerry, in his becoming old, keeps his inquisitive and benevolent look on the Human Being who is the ultimate and the most beautiful destination of life's journey.

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