Chapter 2
The Origins of Dynamic Assessment: Sociocultural Theory and the Zone of Proximal Development

Abstract In this chapter, the central concepts of Vygotsky's Sociocultural Theory are discussed, and particular attention is given to the Zone of Proximal Development. The Zone of Proximal Development, or ZPD, was Vygotsky's solution to overcoming the instruction–assessment dualism. The evolution of this concept in Vygotsky's writings is traced, as are its relations to other aspects of the theory, namely mediation and internalization. The introduction of the ZPD to Western researchers, and its subsequent misinterpretations, are described. The connections between divergent views of Vygotsky's work and the emergence of DA methodologies are elaborated.

Keywords Sociocultural theory, zone of proximal development, mediation, internalization, development

2.1 Introduction

An historical precedent to Dynamic Assessment can be found in the Socratic dialogues described by Plato. Through clever questioning and quick insightful responses, Socrates succeeds time and again in helping his interlocutors to see the flaws in certain ideas while at the same time collaboratively constructing a new perspective. An excellent example of such a dialogue occurs in *Phaedrus* (Plato, 1998), where Socrates employs a series of leading questions and suggestions to help the title character identify certain logical problems in a speech he had been admiring, and thereby sets the stage to launch off in new directions of thinking on the topic. To some degree, then, the Socratic dialogue involves simultaneously assessing and instructing. The initial response that Socrates' questions elicit is indicative of his interlocutors' thinking at that moment. However, unlike a conventional test, Socrates does not end the dialogue after this answer but rather continues to collaboratively explore the issue with his audience, attuning additional questions and suggestions to each new response that they give. While at first it may appear that Socrates is merely quizzing his

M.E. Poehner, *Dynamic Assessment*.

audience, the resolution of each dialogue leaves little doubt that his game also involves teaching them.

Dynamic Assessment, with its roots in Vygotsky's theory of mind, takes the integration of assessment and instruction much further by enabling the leader in this dialogic dance to optimally promote learners' abilities by continually fine-tuning their mediation to the learners' changing needs. In fact, central to DA is the tenet that cognitive abilities can only be fully understood by actively promoting their development. DA overcomes the assessment–instruction dualism by unifying them according to the principle that mediated interaction is necessary to understand the range of an individual's functioning but that this interaction simultaneously guides the further development of these abilities.

As should be clear from the previous chapter's review of current approaches to assessment, DA is at odds with the dominant perspective that the social environment must be controlled and individuals assessed in isolation in order to obtain uncontaminated measures of ability. A monistic view of assessment and instruction becomes possible if we follow Vygotsky's argument that cognitive abilities emerge from interactions in the world and that these are always mediated. In Vygotsky's view, abilities do not simply mature on their own but instead result from individuals' histories of engaging in activities with others and with cultural artifacts. Thus, the key to overcoming the assessment–instruction dualism lies in a rejection of some of the most hallowed concepts in psychology and education, namely innatist theories of mind and the model of the autonomous individual. DA, then, represents much more than a methodological innovation – it compels us to reconsider what it means to be a human being.

These statements may sound rather grandiose. To be sure, before accepting any such paradigm shift, the theoretical claims underlying the approach must be carefully considered and the available empirical evidence evaluated. In this regard, applied linguistics researchers and L2 teachers and assessors are at a distinct advantage as DA has been around for several decades. Our goal in the next few chapters will be to arrive at an understanding of Vygotskian theory and the potential it holds for reevaluating educational practices. Our discussion will focus specifically on following the development, from Vygotsky's early theoretical and empirical work, of the leading DA methodologies. As will become clear, each of these approaches has in common a belief that human cognitive abilities can be modified through appropriate intervention, that we are not, so to speak, slaves to our biology. Nevertheless, important differences do exist among DA approaches, and our review will be a critical one, weighing the advantages and disadvantages of each relative to specific educational goals.

The present chapter discusses the central concepts in Sociocultural Theory, with particular attention given to the Zone of Proximal Development. There are several excellent books devoted entirely to explicating this theory (e.g., Kozulin, 1990; Van der Veer and Valsiner, 1991; Wertsch, 1985), its implications for education (Kozulin et al., 2003; Wells and Claxton, 2002), and its relevance for the L2 domain (Lantolf, 2000; Lantolf and Thorne, 2006). Because our purpose here is to reconceptualize assessment and instruction from a Vygotskian perspective, I will focus only on

those aspects of SCT that relate directly to DA. Our treatment of theoretical constructs such as mediation and internalization is by no means exhaustive, and I refer the interested reader to the works listed above. We will move rather quickly toward a discussion of the ZPD, as this was Vygotsky's solution to overcoming the instruction–assessment dualism. We will trace the evolution of this concept in Vygotsky's writings as well as its introduction to Western researchers. As explained below, the divergent interpretations given to the ZPD have led to important methodological differences among DA approaches.

2.2 Vygotsky's Sociocultural Theory of Mind

As explained in the last chapter, Vygotsky and his colleagues developed what has come to be known alternatively as sociocultural theory, social historical theory, cultural psychology, and cultural historical psychology during a period of intensive research in the 1920s and 1930s. In fact, Vygotsky carried out the bulk of this work following an attack of tuberculosis and preceding another, which resulted in his untimely death at the age of 37. Although his chief collaborators, Luria and Leontiev, continued to pursue the lines of research Vygotsky began, theirs was not the government-sanctioned approach to psychology under the Stalinist regime, and so the work remained relatively unknown for many years even in the Soviet Union (Kozulin, 1990, p. 240). Over the last 50 years, as the early behaviorist models of psychological functioning gave way first to theories that liken the mind to a computer and, more recently, to perspectives that emphasize the social environment's role in the development of mental processes, Vygotsky's work has become remarkably relevant again. With the English translation of his collected works appearing in the 1990s, a new generation of scholars has been introduced to his ideas.

While at first it may seem ironic that a theory developed so long ago continues to be relevant to the issues that face contemporary psychologists and educators, the reality is that the context in which Vygotsky worked is in many ways similar to our own. While the problems Vygotsky struggled with may be familiar, his solutions were so original and innovative as to earn him enduring international renown (Van der Veer and Valsiner, 1994, pp. 1–5). In part, the originality of Vygotsky's ideas can be attributed to his broad intellectual background, which included studies in literature, philosophy, law, and medicine. One of his primary sources of inspiration was Marxist philosophy, particularly his writings on labor activity and tool use. As Engeström and Miettinen (1999, pp. 4–5) observe, contemporary Vygotskian scholars often downplay or overlook entirely the importance of Marx's ideas for SCT, usually for political reasons. The authors go on to argue that it is not Marx's critique of capitalism that must be understood but rather the theoretical concepts he develops to accomplish his analysis (ibid.). Vygotsky and his colleagues accepted Marx's crucial insight that human beings shape and are shaped by their environments through concrete activity mediated by physical tools and they extended this to the psychological plane, proposing that human cognitive functions are also

mediated (Leont'ev, 1981). Indeed, the various names by which Vygotsky's theory is known are all intended to capture the basic tenet that human cognition is mediated *socially* through interaction with others and *culturally* through the use of cultural objects (Cole and Engeström, 1993; Vygotsky, 1986; Wertsch, 1985). Engaging in activities that are mediated by others and by cultural objects allows individuals to develop what Vygotsky described as higher forms of consciousness that are unique to humans (Vygotsky, 1978). In this way, individuals develop awareness of and control over their psychological functions, including attention, perception, and memory. This seemingly simple idea has profound implications for the study of mind and mental development as well as for educational practices, a point that will be elucidated as we consider the central concepts in SCT.

2.2.1 Mediation Through Physical and Symbolic Tools

Kozulin (1998, 2003) suggests the terms *physical, symbolic,* and *psychological tools* as a way of conceptualizing Vygotsky's central argument that an individual's social and cultural environment is the source of the development of higher psychological functions. From a Vygotskian perspective, humans relate to their world *psychologically* in much the same way as they do *physically*. To take a mundane example, consider the activity of constructing a table. To obtain the necessary raw materials (assuming for a moment that one opts not to simply visit a local hardware store), one must first chop down a tree and then carve out the pieces of wood that will later be sanded, finished, and assembled. Unlike other animals, humans have developed tools to facilitate each stage in this process, including axes, saws, sanders, and drills. While one need not use the latest power tools, it is impossible to imagine accomplishing this activity without using some basic tools. In this way, humans are able to transform their environment in ways that other animals do not. However, this is not the full picture. Following an intellectual tradition that dates back to the work of Hegel, Marxist philosophy posits a dialectic relationship between humans and their environment whereby humans not only transform their environment through tool use but are themselves transformed in the process (see Engeström and Miettinen, 1999). After all, to be valuable, tools must be used in a specified manner and not in some other way. To return to the example of constructing a table, effective use of an axe entails grasping the handle rather than the blade and making a swinging or chopping rather than sawing motion.

An important aspect of this perspective is that it underscores the uniquely human ability to break beyond biological limitations through cultural means. For instance, humans are not able to run as quickly as many animals, cannot swim as efficiently as fish, and are unable to fly like birds, but we have developed machines such as cars, trains, boats, and planes, that allow us to surpass other animals in each of these domains. In medicine, hearing aids, pace makers, prosthetic limbs, and eyeglasses all represent culturally specific solutions to overcoming biological impairments. In the field of education, new instructional technologies are continually being created

to help individuals with dyslexia, Downs Syndrome, and autism develop their abilities beyond what was once thought possible. In this way, the physical tools that we create mediate our relation to the world.

Of course, this last example is particularly interesting because, as teachers, we offer our learners far more than new technologies. Vygotsky understood this as well, and his interest in the development of psychological functions led him to suggest that just as humans use physical tools to mediate their relation to the world in *concrete* ways, they also use symbolic tools to mediate themselves on a more *abstract* plane. Signs, various numeric and writing systems, graphs, charts, and tables are all examples of symbolic tools (Kozulin, 2003, p. 18). Unlike physical tools, symbolic tools, which Vygotskian researchers generally refer to as *cultural artifacts*, may not only be directed outwardly to mediate our relationship with the world, but also inwardly, to mediate our relationship with ourselves (Vygtosky, 1994b). In fact, for Vygotsky cognitive development *means* gaining the ability to mediate one's own thinking, and it is for this reason that Vygotsky conducted much of his empirical work, where he could observe and intervene in cognitive functions while they were in the process of forming.

Vygotsky observed that children are mediated by others into using symbolic tools very early on. One example he describes involves pointing. Initially, this simple gesture is not a gesture at all but an effort to grasp some object. When another person enters the picture, perhaps the mother, she interprets the move as a gesture. In other words, what for the child is an attempt to reach an object becomes for others a sign that directs their attention. Later, when the child understands the connection between the grasping attempt and the effect it has on others, the move comes to hold meaning – that is, to function as a form of symbolic mediation – but this is only after it has been imbued with meaning by adults (Vygotsky, 1978, p. 56).

As children develop, they learn to use other symbolic tools, especially language, to influence others. Importantly, while children may use these symbolic tools to influence others, they in turn are influenced *by* others who are also using these same artifacts. Through this reciprocating relationship individuals develop the ability to use symbolic tools to regulate themselves in physical as well as mental activities. Vygotskian theory explains that human cognitive development involves passing from a stage of *object regulation* (where, like animals, our behaviors are controlled by our immediate field of perception) to *other regulation* (when, for instance, we act under the direction of another person) and ultimately to the stage of *self-regulation* (characterized by the ability to mediate oneself through symbolic tools) (Vygotsky, 1986, 1997).

To illustrate, consider the basic need to satisfy hunger. At the level of object regulation, psychological functioning is controlled by the environment rather than by the individual, and so in response to hunger the individual eats what is immediately available or goes in search of food. Deliberately delaying feeding is not an option. Others may enter the picture and perform a regulating function, perhaps ordering the individual to eat something or forbidding him from doing so. Individuals may also work in cooperation to achieve their ends, with each member of a group participating differently but contributing nonetheless to the realization

of their common goal. A well-known example involves the activity of hunting, in which some individuals will beat the bush to scare their game out of hiding so that other members of the group can kill the animal, and all can eat (Leont'ev, 1981, p. 210). At the level of self-regulation, individuals begin to think in particular ways about how, when, and with which cultural artifacts they will accomplish various ends. They may decide to participate in the hunt or not, they may choose to eat later, when they can join a friend for a meal in a restaurant, or perhaps they will decide not to eat at all in an effort to lose weight. Self-regulation is the ability to control one's responses, so that actions are not merely instinctive but instead result from voluntary consideration of possible alternatives and intentional selection of a course of action. In this way, humans are agentive in ways that other animals are not because they can choose when and how they will satisfy their needs. Of course, up to this point we have not answered the question how precisely the use of symbolic tools enables individuals to self-regulate, and this is a matter of the utmost importance because it concerns the very meaning of development in SCT.

2.2.2 Internalization and the Development of Psychological Tools

According to Vygotsky, learning to use symbolic tools as mediating artifacts through engaging in activities with others gives rise to new forms of cognition through a process known as *internalization* or "ingrowing" (Vygotsky, 1994b, p. 65). Vygotsky acknowledged that humans, like other animals, are endowed with a biological capability to develop lower-level or natural psychological processes. What is unique to humans is that this biological substrate is radically changed as social and cultural forms of mediation are internalized and reemerge as higher-level cognitive functions. In this way, individuals gain control of their own cognition – that is, they come to self-regulate. As Vygotsky explained:

> Culture, generally speaking, does not produce anything new apart from that which is given by nature. But it transforms nature to suit the ends of man … it also consists of inner changes in that which was given by nature in the course of the natural development of behavior. (Vygotsky, 1994b, p. 59)

Earlier in this chapter we saw that Vygotsky was working from a Marxist theoretical perspective that posits a dialectical rather than dualistic relationship between individuals and their environment. Internalization was Vygotsky's solution to the nature–nurture dualism, a debate that continues in many circles to this day. In his view, it is inappropriate to attribute human psychological functioning solely to biology or to the social world as both are absolutely necessary, and, importantly, culture allows all individuals – even those with biologically rooted mental disabilities – to move well beyond the limits of biology (Vygotsky, 1993, p. 256). Moreover, Vygotsky saw internalization as an approach to unifying what have generally been regarded in psychology as two distinct spheres – the social and the mental. For

Vygotsky, their relationship rests on the basic principle that our functioning in cooperation with others is *interpsychological*, and that when we begin to perform these functions independently they have moved from the interpsychological to the *intrapsychological* plane. This leads to Vygotsky's well-known maxim, that all cognitive functions appear twice in the history of their development, initially as an interpersonal process (between an "I" and a "You") and later as an intrapersonal one (between "I" and "Me") (Vygotsky, 1978, p. 56). He explains its significance as follows:

> The internalization of socially rooted and historically developed activities is the distinguishing feature of human psychology, the basis of the qualitative leap from animal to human psychology. (Ibid.)

Luria (1979, p. 45) eloquently expresses the magnitude of this perspective by observing that it is through the internalization of social and cultural forms of mediation that "the social nature of people comes to be their psychological nature as well."

Of course, as Lantolf (2003, p. 351) points out, internalization should not be crudely regarded as literally placing something inside a person's head. A more accurate understanding of internalization can be found in Vygotsky's experimental research. Vygotsky (1994b, pp. 64–66) describes one study in which children were read a list of words and asked to recall as many as they could. Initially, the children attempt the task with no external means of support, relying exclusively on memory. At the next stage, the experimenter offers them a series of cards with pictures that correspond in obvious ways to the words, and so the children learn to use the cards to remind them of the words they need to recall. This addition greatly enhances the children's performance, as one would expect, but when the children are given cards that do not have a clear connection to the words they are read, their performance falls apart. Because the children do not know how to use the cards as a mnemonic to mediate their remembering, they do not give the correct words but instead say other words suggested by the pictures. Vygotsky reports that with time, and additional attempts, the children usually learn to mediate their act of remembering by carefully selecting a card that corresponds to each word that they hear, often creating unique and idiosyncratic associations between the word and picture. As Vygotsky puts it, the child "replaces the processes of memorizing by a rather complicated external activity" (p. 65) whereby the cards function as symbolic mediators because they have been assigned meaning by the children. In the final and most important phase, "the external activity of the child remembering by means of a sign passes on into internal activity. The external means, so to speak, becomes ingrown or internal" (ibid.). Vygotsky explains that this can be observed when, for instance, a child is asked to complete the tasks with the cards in a prearranged order. His ability to do this regardless of the words he must remember indicates that the cards are no longer necessary as the child is able to create his own mental representations (e.g., contexts, stories, and persons) that help him complete the task. Moreover, Vygotsky points out that conclusions about the child's abilities are confirmed when he performs equally well on related but different tasks, "even when external conditions have changed radically" (p. 66). This last point is especially relevant to DA and the concept of transfer, and will be returned to later in this chapter.

In Vygotsky's example, the children's memory is transformed through their appropriation of symbolic tools. Kozulin (1998, 2003) refers to these transformed cognitive functions as *psychological tools*. Focusing his remarks specifically on an educational program developed by DA practitioner Reuven Feuerstein (discussed in detail in the next chapter), Kozulin (1998) argues that the extensive and intensive use of charts, tables, graphs, and other cultural artifacts allow learners to interact with instructional tasks in a mediated rather than a direct manner. Through engaging in educational activities that involve, among other things, "coding and decoding, the use of models and formulae, representation of one and the same problem in different modalities, generalization, and classification," learners develop *internalized* versions of the cultural artifacts that they use to complete the tasks (Kozulin, 1998, p. 89). In other words, charts, tables, and graphs allow learners to begin to think and to approach problems in new ways. In their internalized form, these symbolic tools take on psychological significance that afford learners' greater awareness of and control over cognitive processes, and from a Vygotskian perspective this *is* development (ibid.). Kozulin describes the significance of psychological tools as follows:

> Hypothetical reasoning, theoretical experimenting, the use of models, generalized problem solving, and other scholastic activities cannot be accomplished without some form of symbolic representation based on the use of psychological tools. (pp. 84–85)

From this perspective, education can be thought of as the activity of helping learners to develop psychological tools, thereby enabling them to interact with the world in increasingly complex ways.

In formal schooling, instructional time is typically segmented into periods for learners to study specific content domains. Vygotsky's students and colleagues who carried out research and devised educational innovations in the Moscow public schools noted that content areas each have their own organizational and conceptual logic (see especially the work of Davydov, 1988; Gal'perin, 1989; and Markóva, 1979). Indeed, Vygotsky himself distinguished the knowledge individuals acquire through everyday life experiences from the systematically organized domains of knowledge encountered in formal schooling (Vygotsky, 1978, 1986). Knowledge from everyday life, which Vygotsky referred to as *spontaneous concepts*, is usually based on simple observations and therefore remains on a more superficial level. In contrast, Vygotsky described the knowledge presented in school as *scientific concepts* because it is the result of principled inquiry and study. Karpov (2003, pp. 65–66) borrows an example from Zaporozhets (1986) to illustrate the difference between everyday and scientific concepts. Small children placing various objects (e.g., coins, pins, needles) in water and observing that they sink may draw the conclusion that all small objects sink. While this might seem reasonable, it is inaccurate and would lead the children to make additional predictions that would also be false. In school, children are introduced to Archimede's Law, and learn to accurately predict the behavior of objects in water. It is important to note that although spontaneous concepts are derived from experience and are therefore often unsystematic and inaccurate, they provide a basis for the development of scientific concepts. Moreover, the power of scientific concepts is that they transform individuals' everyday knowledge by making

them aware of their spontaneous concepts but also restructuring them. As Karpov (2003) explains: "once acquired by students, scientific concepts begin to mediate their thinking and problem solving" with the result that "students' thinking becomes much more independent of their personal experience" (p. 66).

Most importantly, scientific concepts are themselves psychological tools because they mediate our understanding of the world and therefore our engagement in various activities in the world. As Kozulin (2003) correctly observes, from a Vygotskian perspective:

> There is no opposition between cognitive mechanisms and content knowledge for the simple reason that content appears here in a conceptual form that defines not only the content but also the type of reasoning involved. Because sociocultural theory emphasizes the historical character of human cognition, the conceptual structure of disciplinary knowledge appears here as a veritable form of human thinking. (p. 33)

Domains of knowledge, then, all have their own underlying logic, their own unique concepts that serve as "symbolic devices" for representing their object of study, for highlighting specific aspects of that object, and for organizing relationships among the various categories and principles that constitute the domain (Kozulin, 1998, p. 161). The conceptual study of history, mathematics, foreign languages, and other disciplines enables individuals to develop new psychological tools – scientific concepts – and this has practical consequences. In addition, from this perspective one does not first develop the psychological tools requisite for studying content areas but develops the tools through conceptual study. This insight has important implications for how one understands the relationship between instruction and development. As we will see in the next section, the nature of this relationship was a major source of debate in Vygotsky's day and his proposal of the Zone of Proximal Development was, in part, a response to the Piagetian notion of readiness. For Vygotsky, teaching has the greatest impact on development when learners are mediated into performing beyond their current capabilities (i.e., beyond what they are able to do independently). Of course, this requires a detailed understanding of learners' current level of development, and this includes cognitive functions that they have fully as well as only partially internalized. With the ZPD, Vygotsky believed that it was possible to simultaneously gain this broad perspective on development and help learners move beyond their present abilities. Vygotsky did not arrive at this insight all at once, but developed the concept over time. We will now turn our attention to tracing the genesis of the ZPD.

2.3 Theory in Action: The Zone of Proximal Development

2.3.1 Defining the Zone of Proximal Development and its Contexts of Use

Chaiklin (2003, p. 40) observes that the ZPD is among the most well known of Vygotsky's contributions to psychology and education and is perhaps the aspect of

his work that has received the most widely divergent interpretations and applications. In a similar vein, Wertsch (1984, p. 7) expresses concern that the term has been used so widely and to understand so many psychological phenomena without a clear grounding in Vygotsky's conceptualization of the ZPD as a theoretical construct. According to Wertsch, researchers using the ZPD "loosely and indiscriminately" risk turning it into a notion "so amorphous that it loses all explanatory power" (ibid.). The range of interpretations of this construct is due, in part, to the scant material on the ZPD that has survived in Vygotsky's writings; little is available in Russian and even less in English. Indeed, following Van der Veer and Valsiner's (1991, p. 329) tracing of the concept in Vygotsky's work, the ZPD first appears only 1 year before his death in 1934, and Chaiklin (2003, p. 43) points out that it is only discussed by Vygotsky in eight places, including manuscripts, transcripts of lectures, and book chapters (see Chaiklin, 2003, pp. 44–45 for a full listing). Of all Vygotsky's descriptions of the ZPD, it is the one that appears in *Mind in Society* that is cited over and over. There, Vygotsky defines the ZPD as "*the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers*" (Vygotsky, 1978 p. 86, italics in original). This definition, particularly when it is taken in isolation from the rest of Vygotsky's work, can yield numerous interpretations. Indeed, even when all Vygotsky's writings on the ZPD are considered questions still arise. For example, Wertsch (1984, p. 8) points out that nowhere does Vygotsky provide specific examples of what he means by *adult guidance* and *collaboration*.

Recently, the variety of perspectives on the ZPD that currently characterizes Vygotsky-inspired research has prompted some authors to avoid the term altogether or to restrict its usage to certain specific situations. For instance, one of the more conservative readings of the ZPD is that proposed by Chaiklin (2003). He argues that the ZPD was not intended for the analysis of domain-specific learning nor was it meant to explain adult learning. In Chaiklin's view, the ZPD is also neither a heuristic nor a metaphor, as some authors have suggested. He maintains that the ZPD, as envisioned by Vygotsky, is tied to the latter's model of age periods of child development (Chaiklin, 2003, pp. 48–50). The child is said to pass through periods of relative stability punctuated by crisis periods during which *qualitative structural* changes result in novel cognitive functions. Vygotsky referred to these radical leaps in development as "revolutionary breakthroughs" (Vygotsky, 1984, p. 249; cited in Valsiner and van der Veer, 1993, p. 41). The ZPD was Vygotsky's proposal for understanding children's relative proximity to the next age level of development, performing what he referred to as "diagnostics of development" (Vygotsky, 1998). In this regard, Vygotsky defined such diagnostic assessments as a two-step process. One must first uncover children's *actual* level of development (i.e., cognitive functions that have already matured), which he suggests can be accomplished through observation of their independent problem solving. Then, through analysis of their responsiveness during joint problem solving, the researcher can assess their *proximal* level of development, understood as those cognitive functions that have not yet matured but are only in the process of maturing and which are required for the next

age period. This leads Chaiklin (2003) to conclude that the ZPD should not be used in a general way to refer to development brought about by interaction and assistance because such "assistance is meaningful only in relation to maturing functions needed for transition to the next age period" (p. 57). In Chaiklin's view, most domains of educational research and practice, including Dynamic Assessment presumably, do not benefit from using the term Zone of Proximal Development and should instead rely on alternative terminology such as scaffolding and assisted instruction (p. 59).

Chaiklin's charge is a serious one and not to be dismissed out of hand. To be sure, some interpretations and applications of the ZPD are more in line with Vygotsky's than others, and this is patently clear when one considers the various DA approaches, which we will do in the next chapter. The rest of this chapter offers an in-depth discussion of how Vygotsky understood the ZPD so that we will be better positioned to evaluate the ways in which DA researchers make use of the concept. Before moving on, I would like to respond to Chaiklin by making two important points regarding the use of SCT concepts in DA and in educational research on the whole. The first of these concerns the significance attributed to Vygotsky's work. As Davydov and Radzikhovskii (1985) argue, Vygotsky's empirical psychological investigations should be distinguished from his contributions as a methodologist of psychology and the human sciences more generally (p. 37). That is, although his own research focused primarily on children, the scientific methodology he devised and the theoretical constructs he proposed need not be limited to children. Indeed, Vygotsky's interest was in human cognitive functioning, which he believed could best be understood by following the path of its development, and this is the reason for his focus on children. Removing his theoretical constructs from the context of children and applying them more broadly to questions of development is not only in keeping with the spirit of Vygotsky's work but it is essential to advancing his program to understand human consciousness. Vygotsky's own colleagues and students similarly investigated the rehabilitation of cognitive functions, as with brain-damaged patients (e.g., Luria, Sacks & Solotaroff, 1972) and employed his ideas to understanding the development that occurs through studying scientific concepts in particular domains, as explained earlier. There is no reason, then, to object to the use of Vygotsky's methods and constructs to illuminate processes of development that occur through various socially organized activities, including the study of second languages. Moreover, most researchers working in Vygotskian theory today (e.g., Kozulin, 1998; Minick, 1987) as well as in DA (e.g., Brown and Ferrara, 1985; Lidz, 1991) rightly recognize Vygotsky as a "founding father" of the dynamic approaches to assessing cognitive abilities. In fact, it will be argued in the following subsections that Vygotsky's discussions of the ZPD, while sparse in some respects, actually provide the groundwork for the two dominant approaches to DA today, namely the psychometric and the clinical. Van der Veer and Valsiner's (1991) detailed summaries of some of Vygotsky's lectures, in addition to Vygotsky's own writings (Vygotsky, 1956, 1986, 1998) will be considered in order to bring to light some of the aspects of the ZPD concept that are often overlooked by researchers but that resonate in important ways with the rest of the theory. Specifically, I will argue that current DA research was substantially

impacted by Vygotsky's discussions of the ZPD in the context of intelligence testing and the relationship of schooling to development.

An even more compelling response to Chaiklin's concerns is that DA, particularly the approach developed by Reuven Feuerstein (discussed in detail in the next chapter), is explicitly concerned with creating instructional procedures to intervene in learner development, and in this way DA research feeds back into SCT and further develops the ZPD concept. This work demonstrates the great potential of the ZPD as not simply a theoretical concept but an activity that illuminates and guides development, and this is surely relevant to contexts that are not tied to age periods in childhood development (see Valsiner and van der Veer, 1993, for a similar argument as well as a review of several lines of research that are productively developing the ZPD concept in different domains).

2.3.2 Genesis of the ZPD in Vygotsky's Work

In contrast to Chaiklin, Van der Veer and Valsiner (1991), while also critical of some of the ways in which the ZPD is currently used, nevertheless offer an interpretation of Vygotsky's work that allows considerably more room for the concept to be extended and applied to various contexts. In fact, these authors suggest that Vygotsky himself was of two minds on the subject. They explain that the ZPD initially appeared "in the narrow context of traditional intelligence testing and was later gradually broadened to encompass the general problem of the relation of education and cognitive development" (pp. 328–329). As will be argued below, these two accounts of the ZPD in Vygotsky's writings were, for him, interrelated but nevertheless foreshadow the divergent interpretations of the concept in the work of DA researchers. Both of Vygotsky's descriptions of the ZPD – as an alternative to IQ testing and as a means of promoting development through formal schooling – are thoroughly explained in a paper he gave at the Bubnov Pedagogical Institute in 1933 entitled "Dynamics of mental development of schoolchildren in connection with teaching," which is summarized in detail by Van der Veer and Valsiner (1991, pp. 336–341). According to these authors, the Russian manuscript of this talk provides the most in-depth account of Vygotsky's understanding of the ZPD and so it will serve as the basis for much of the following discussion.

2.3.3 The ZPD as an Alternative to IQ Testing

In his lecture on mental development and schooling, Vygotsky mentioned that researchers had demonstrated that IQ scores were an accurate predictor of a child's success in school and that many schools used IQ scores to group children by ability level. However, Vygotsky also referred to research indicating that during the first years of schooling children with initially high IQs tend to lose IQ points and children

with low IQs gain IQ points. In order to understand this phenomenon Vygotsky and his colleagues proposed the use of an alternative methodology for assessment, one that included the use of "hints and prompts" during the testing procedure (Van der Veer and Valsiner, 1991, p. 337). Vygotsky theorized that not all children would respond to such assistance in the same manner, with some benefiting more than others (ibid.). Elsewhere, he provided the following example to illustrate this point:

> Having found that the mental age of two children was, let us say, eight, we gave each of them harder problems than he could manage on his own and provided some slight assistance: the first step in a solution, a leading question, or some other form of help. We discovered that one child could, in cooperation, solve problems designed for twelve-year-olds, while the other could not go beyond problems intended for nine-year-olds. The discrepancy between a child's actual mental age and the level he reaches in solving problems with assistance indicates the zone of his proximal development. (Vygotsky, 1986, p. 187)

In this way, Vygotsky hoped to have a more comprehensive understanding of children's mental functioning than IQ scores can provide.

In order to validate this model, Vygotsky and his colleagues conducted a large-scale empirical study with children entering school. Their results allowed them to group the children according to high or low IQ scores and large or small ZPDs, as determined by their responsiveness to assistance (i.e., the more responsive children were said to have a large ZPD and the less responsive students a small ZPD). Importantly, Vygotsky reported that not only did the size of the children's ZPD turn out to correlate well with their success in school (large ZPD children were more successful than small ZPD children) but that ZPD size was actually a *better* predictor of school performance than IQ.

In entering the debate over the value of IQ scores and the appropriateness of their use for the classification of children, Vygotsky was, to some extent, pressured to either endorse existing IQ tests or propose an alternative. Given the impressive results of his empirical ZPD work, one might expect he would have opted for the latter. However, in his 1933 presentation at the Bubnov Institute, he did not reject outright IQ testing but instead argued that IQ tests and ZPD assessments report two separate domains, independent and assisted performance. Moreover, he stated that the future development of the former was determined by the latter (Van der Veer and Valsiner, 1991, p. 341). He also stressed the quantification of both these abilities in the form of present and potential IQ scores. Thus, unlike in his other writings where he urged use of the ZPD to uncover processes of development (as in Vygotsky, 1986, 1998), Vygotsky saw quantification of the ZPD as most useful in the context of IQ reform. At this point in his thinking, then, Vygotsky presents us with a much less dynamic picture of the ZPD than normal. For example, he noted in his lecture that the children who received initially high IQ scores did so:

> [A]t the cost of their zone of proximal development, that is, they run through their zone of proximal development earlier, and, therefore, they are left with a relatively small zone of development, as they to some extent already used it. (Vygotsky, 1933, p. 53; cited in Van der Veer and Valsiner, 1991, p. 341)

As Van der Veer and Valsiner (1991) point out, one would expect the child's ZPD to continually move forward such that there will always be a difference between

what the child can do with assistance and her unaided performance. This would certainly be in keeping with Vygotsky's overall theory and its emphasis on the dynamics of development and its generally non-teleological orientation. However, it is directly contradicted by some of Vygotsky's remarks about the ZPD given here, particularly his characterization of the child's dynamic development occurring in a "static environment" or against a "static background" (see Van der Veer and Valsiner, 1991, pp. 341–343).

One possible explanation for this apparent discrepancy is that Vygotsky actually conceived of two possibilities for constructing a ZPD. A mediator could proceed through a fixed repertoire of predetermined assistance designed to help children complete a given task and to gain efficiency in doing so. Children receiving this form of mediation could certainly reach a point where assistance on an IQ test becomes irrelevant because they can complete all the problems on the test independently. In this way, they can be said to have "run through" their ZPD, as their unassisted and assisted IQ scores will be the same. An alternative approach to constructing a ZPD allows for mediation to emerge from the interaction between the mediator and the learner. This approach privileges the simultaneous understanding and promoting of the processes of development over any arbitrary restrictions on mediation. It is this account of the ZPD to which we will now turn. Before moving on, it is worth noting that both of these approaches have been taken up and to some degree fleshed out by DA researchers (see discussion below of interventionist and interactionist DA). Of course, because many of the important details of the empirical investigations carried out by Vygotsky and his colleagues were not reported in Vygotsky's writings and lectures on the ZPD, the precise nature of the assistance offered to his participants cannot be known.

2.3.4 The ZPD as a Means to Promote Development Through Instruction

At the time of Vygotsky's talk at the Bubnov Pedagogical Institute, several competing models of the relationship between schooling and development existed, with the dominant view being that proposed by Piaget. According to this "organistic" view, teaching should follow development, and cognitive processes are left to evolve or mature along a natural course; it is only when the prerequisite development has occurred that instruction should begin (Van der Veer and Valsiner, 1991, p. 329). Vygotsky rejected this position on the grounds that it left no room for instruction to seriously impact upon development, an issue particularly salient in work with children with special needs, where Vygotsky had considerable expertise. Vygotsky argued that if children have difficulty performing a given task or grasping a concept, they should not be left alone until they develop on their own a "readiness" to learn; on the contrary, they should receive focused intervention designed to bring about development. On the basis of his theoretical position regarding the role of mediation in the development of mind and the early work he and his colleagues had

done on the ZPD and IQ testing, Vygotsky suggested that instruction and development are two separate processes but that instruction should be sensitive to the periods in children's development when teaching can have an optimal effect. It is important to keep in mind, however, that this does not equate to the Piagetian notion of readiness. On the contrary, Vygotsky envisioned instruction aimed at a moving target, a timing that did not coincide with children's present abilities but that was not too far beyond their current potential. For instruction to be most useful it should be "oriented toward the future, not the past," directed not at what children are already capable of doing independently but at their "upper threshold" of functioning as it is in this way that instruction helps them realize their future abilities (Vygotsky, 1986, p. 189). The issue, then, is determining the "range" or "zone" (see Valsiner and van der Veer, 1993, p. 36 for a discussion of Vygotsky's adoption of Kurt Lewin's topology metaphors in psychological discourse) in which formal *instruction* can bring about the *development* of psychological functions.

Acknowledging the work of Meumann and certain American researchers, Vygotsky suggested an approach to the assessment of cognitive abilities that could take account of children's current level of development and their potential for future development. In fact, he wrote that "determining the actual level of development not only does not cover the whole picture of development, but very frequently encompasses only an insignificant part of it" (Vygotsky, 1998, p. 200) and even went so far as to assert that "to establish child development by the level reached on the present day means to refrain from understanding child development" (Vygotsky, 1933, p. 119; cited in Van der Veer and Valsiner, 1991, p. 329). However, as Van der Veer and Valsiner (1991) explain, this "double-level approach" to understanding development did not devalue the consideration of actual cognitive functioning, since "this would be denying that every process has its history" and that a given function "develops before it becomes measurable in practice" (p. 329). Instead, Vygotsky's proposal highlights the difference between present development and future development and attempts to understand the processes that led to learners' present development and the processes at work in the creation of their future development. For Vygotsky, these processes vary independently of one another, and the former should not be used to predict the latter. That is, a learner's future should not be assumed to be a simple extension or continuation of her present.

It is in this regard that Vygotsky took the ZPD far beyond the context of generating alternative IQ scores and framed the concept as an essential part of any true diagnostic of an individual's ongoing cognitive development. Returning to his favorite example of two children whose independent problem solving is the same but who profit differentially from assistance, Vygotsky elaborated:

> From the point of view of their independent activity they are equivalent, but from the point of view of their immediate potential development they are sharply different. That which the child turns out to be able to do with the help of an adult points us toward the zone of the child's proximal development. This means that with the help of this method, we can take stock not only of today's completed process of development, not only the cycles that are already concluded and done, not only the processes of maturation that are completed; we can also take stock of processes that are now in the state of coming into being, that are only ripening, or only developing. (Vygotsky, 1956, pp. 447–448; cited in Wertsch, 1985, p. 68)

Rather than emphasizing the ZPD as training for improving IQ scores through schooling, the ZPD is put forth here as a way of understanding processes of development *before* they are fully matured. The importance of this for schooling is that instruction that is sensitive to learners' ZPDs will help them reach their potential while instruction that does not take account of the ZPD will only lead to development on a hit-or-miss basis. That is, this form of instruction will succeed only when it happens to coincide with a learner's ZPD. In Vygotsky's words:

> [S]ince teaching depends on immature, but maturing processes and the whole area of these processes is encompassed by the zone of proximal development of the child, the optimum time for teaching both the group and each individual child is established at each age by the zone of their proximal development. This is why determining the zone of proximal development has such great practical significance. (Vygotsky, 1998, p. 204)

As discussed in the next section, both of the contexts of Vygotksy's work on the ZPD concept have played an important part in shaping the landscape of DA research.

2.4 Post-Vygotskian Interpretations of the ZPD

2.4.1 Luria's Work with Children with Learning Disabilities

Wozniak (1980) credits Vygotsky's illustrious colleague, A.R. Luria, as having played a significant role in the promotion of the ZPD and related concepts outside the Soviet Union. In particular, Luria is acknowledged for his efforts to introduce the ZPD as both a theoretical perspective on the nature of human abilities and a practical methodology for distinguishing among groups of individuals with varying underlying cognitive potentials. American psychologists such as Milton Budoff and his colleagues were among the first to explore applications of these to their work on intelligence measurement among underprivileged populations, in the process constituting the first Dynamic Assessment research (e.g., Budoff, 1968; Budoff and Friedman, 1964). Despite several remarks made by Luria against psychometrics, the fact that the ZPD was introduced to Western researchers in the context of intelligence measurement was significant. Psychologists of the time, believing that human mental abilities existed as discrete traits that could be measured in much the same way as one's height and weight (see Sacks, 1999, and Gould, 1996, for discussion) adopted the ZPD concept as a means of deriving a more accurate set of scores on standardized intelligence tests. Echoing Vygotsky's early discussion of the ZPD, Budoff and others hoped to obtain higher IQ scores for underprivileged learners by training them on the kinds of tasks presented on the tests. More recently, other researchers (Kozulin, 1998, 2003; Minick, 1987) have criticized these interpretations of the ZPD. Following Vygotsky's writings of the ZPD in relation to schooling and development, these authors insist that the ZPD is best used as a qualitative approach to understanding and promoting the development of cognitive

processes. They suggest that the DA tradition most in line with Vygotsky is that of the Israeli psychologist and educator Reuven Feuerstein, whose work is discussed in considerable detail in the next chapter.

In a paper given as part of a special session entitled "Study of the Abnormal Child" at a meeting of the American Orthopsychiatric Association, Luria summarized some of the issues Soviet psychologists and educators were encountering as they attempted to identify children with learning disabilities for placement in appropriate school settings. Luria (1961, pp. 2–4) distinguished four groups of children who perform poorly in school: (a) children of normal intelligence who under-perform as a result of emotional problems; (b) children with an actual biological impairment such as brain damage; (c) "weak children" whose school performance is adversely affected by their poor living conditions, including disease and malnutrition; and (d) children with "partial defects" who have normal intelligence but whose development is hampered by another problem such as hearing impairment. He explained that traditional educational and psychological diagnoses often failed to distinguish between these groups and, consequently, children with mental retardation, deaf children, and children with poor attitudes toward school were lumped together into institutions where few received appropriate support that allowed for learning to occur.

It is in this regard that Luria took a stand against traditional quantitative approaches to measuring intelligence, arguing that "psychometric tests do not close the problem; they only open the problem" and proposing instead that "the most important problem is that we have to pay more attention not only to the diagnosis, but also to the prognosis of the developmental potential of these children" (p. 5). He explained that much empirical work had been carried out in the Soviet Union investigating an alternative to such tests that was grounded in Vygotsky's writings on the "zone of potential development" (ibid.). Luria then went on to illustrate the concept with the example of three children each of whom received an IQ score of 70 on a traditional test. Acknowledging that "the first rule for every testing psychologist is to consider only those performances which are done by the child independently" (p. 6), Luria explained that the ZPD requires that assistance be given to the child during the assessment. The "prognostic value" of such an approach lies in the analysis of (a) the child's use of the assistance and (b) the extent to which the child's performance improved when given assistance. Additional insights can be gained by later testing the children again but without assistance in order to evaluate improvements in their independent performance, a concept Luria referred to as "the principle of transfer" (p. 7). Luria suggested that this multistep approach to assessment allows for a more accurate picture to emerge of the children's level of cognitive functioning, as some children benefit greatly from assistance and others do not, and some but not all children are able to maintain improved performance after assistance. He concluded, "They [the three children in his example] may be quasi-identical in a *statistical* approach, but they are not identical in a *dynamic* approach, in the zone of their potential development" (ibid., italics added).

The significance of Luria's paper is not only that it preceded major publications of Vygotsky's work in English but that it also predates all of the work that has come

to be known as dynamic assessment. In fact, the earliest DA research to appear in English and gain widespread attention in education and psychology was the work of Budoff (e.g., Budoff, 1968; Budoff and Friedman, 1964), and Budoff cites Luria as instrumental in the development of his particular approach to DA. Budoff's work, in turn, was built upon by other DA researchers, including Campione and Brown and Carlson and Wiedl. In addition, this presentation also demonstrates Luria's impact on DA research through his use of the term "dynamic" to distinguish assessment procedures that made full use of the learner's ZPD from those that did not and his suggestion of pretest–mediation phase–posttest methodologies and transfer tasks.

2.4.2 Objectivity and Experimental Research

However, as alluded to above, Luria's presentation to the American Orthopsychiatric Association also contains the seeds for the greatest bifurcation among DA approaches – the role of psychometrics. Luria himself called for the use of "objective methods" that would lead to the "qualifications" of children's learning problems (in his presentation he offers as an example of an objective method the use of auditory stimuli during experiments in order to differentiate children with concentration problems and children with hearing difficulties from children whose learning problems were rooted in something else). For Luria, then, objective methods were needed *in place of* psychometric ones. Ironically, this point was somehow lost on many in his audience. For example, the session discussant and then vice president of the Association, Arthur Benton, responded to Luria's presentation by first noting the latter's objections to psychometric tests and then stating the following:

> I think that we must remind both ourselves and him that the term "psychometric," as it is currently used in this country [the US], means objective psychological (and often psychophysiological) evaluation and not merely a single test score. American "psychometrics" approximates the objective methods used by the Soviet scientists. (p. 15)

This confusion of the terms objectivity and psychometrics has had important consequences for DA research. Even today, debates continue over the appropriateness of traditional psychometric methods in DA procedures. Kozulin (1998, p. 71) summarizes the issue with the following question: "Should one focus on the quantitative difference between the child's pre-intervention and post-intervention performance, or should the emphasis be placed on the qualitative, structural changes in the child's responses?" Recognizing some of the impressive results obtained in interventionist DA by quantifying the ZPD (e.g., Brown's use of the Graduated Prompt Approach has led to successful differentiation of children with various learning difficulties), Kozulin suggests that Vygotsky's primary emphasis was on "child-oriented qualitative evaluation" of the type conducted by those pursuing interactionist approaches to DA, such as Feuerstein and his colleagues (p. 72).

Minick (1987) critically analyzes current DA methods and their interpretations of the ZPD and argues that some DA researchers have been so preoccupied with

preserving the psychometric properties of their instruments and procedures that they have lost sight of the explanatory power of the ZPD. He points out that Vygotsky proposed the use of the ZPD in contrast to symptomatic assessments that describe an individual's abilities but do not explain them. For Vygotsky, psychological assessments usually are merely descriptive; they fail to illuminate developmental processes, and are therefore no more useful than a doctor diagnosing a patient with a cough as suffering from a cough! Such a diagnosis merely describes what the patient already knows. It explains nothing and offers no insight into how the malady can be remedied. However, by making an individual's ZPD the core of the assessment procedure, "we gain the potential for directly studying that which most precisely determines the level of mental maturation that must be completed in the proximal or subsequent period of his age development" (Vygotsky, 1984, p. 165, cited in Minick, 1987, p. 118). This is the case because the point of assessment in the ZPD is to externalize those processes that are still maturing, and by externalizing them the mediator can intervene in their development. In an interactive, clinical assessment, the cognitive processes that exist on the intermental plane as the mediator and the learner engage cooperatively in a task become transformed and internalized. It is in this way that assessment in the ZPD does much more than explore one's potential for change – it actually helps the individual to change. Thus Minick concludes that:

> To assess the psychological functions that are currently maturing, to predict the proximal stage of a child's development, or to develop programs of education and remediation designed to further that development, the assessment of the ZPD must focus on the qualitative characteristics of the interaction between the adult and child. (p. 137)

As will become clear in the sections that follow, clinical approaches to DA are far less concerned with the test instruments and procedures than with understanding and promoting the learner's development. This perspective is best captured by Vygotsky's maxim that "we must not measure the child, we must interpret the child" (Vygotsky, 1998, p. 204).

2.5 Conclusion

In this chapter I briefly outlined the Sociocultural Theory of Mind developed by Vygotsky that provides the basis for Dynamic Assessment. This theoretical perspective posits a mediated rather than direct relationship between humans and the world. This means that just as our concrete activities are mediated by the physical tools our culture provides, our mental activities are mediated by psychological tools, which are the forms of cognition that arise through the internalization of our interactions with others and our use of symbolic artifacts. In other words, our socially mediated activities change not only our surroundings but also ourselves. Cognitive development is the internalization of external forms of mediation and their reemergence as psychological tools, which allow us to mediate our functioning, an ability Vygotsky described as self-regulation. At any point in time,

individuals' abilities include functions that have been fully internalized as well as other functions that are still in the process of developing. The purpose of psychoeducational assessment, from a Vygotskian perspective, is to understand the full range of individuals' abilities.

In the context of assessment, Vygotsky proposed his famous concept, the Zone of Proximal Development, as a means of capturing both *developed* and *developing* abilities. As a logical corollary to the view of abilities as internalized forms of mediation, Vygotsky argued that what individuals are able to do in cooperation with others indicates their future independent performance. Consequently, traditional assessments, which isolate individuals, should be abandoned in favor of procedures that require examiners to mediate examinees' performances in order to reveal the full range of their abilities. Moreover, because mediated interactions are the driving force of development, this type of assessment is also an instructional activity.

Vygotsky himself emphasized the implications of the ZPD for assessment, as in his research on IQ testing, but foremost in his thinking was how development could be promoted through interactions that are sensitive to the ZPD. When Luria introduced the ZPD to colleagues in Europe and the USA, the quantitative and qualitative orientations immediately attracted attention. In part, this was due to the dominant traditions in testing, which called for objectivity through standardization and statistical analysis. Of course, Luria's understanding of objectivity entails not standardized procedures but rather interactions that proceed according to theoretical principles, in which case a flexible, open-ended approach to mediation is not only acceptable but essential to co-constructing a ZPD with a learner. Both these interpretations of the ZPD have important consequences for DA. In the next chapter, we will consider the leading methods in both interventionist and interactionist DA. As we will see, both the psychometric and clinical orientations to DA have produced impressive results in our understanding of mental functioning and the dynamics of their development.