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The Compatibility of Vygotsky's Theoretical Framework with the Developmental-Interaction Approach

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During the early part of the century, many developing industrial economies engendered progressive movements in education. In Russia, where the economy was evolving more slowly than the social structure, a new vision of human behavior, rooted in Marxist notions of cultural determination and historical materialism, captured the imagination of psychologists and educators.

The theoretical work of the Russian psychologist L. S. Vygotsky was an important catalyst for a long, and until recently, rather obscure tradition of developmental psychology that emphasizes the

importance of human interaction to the development of the mind. Vygotsky studied young children, their activities and learning tools, as well as basic questions in how forms of knowledge are transmitted between generations and between societies. Since then, his followers have looked at educational settings and less formal learning environments, at the activities of work and home life, and learning in nonindustrial societies.

The work complements many of the ideas that we read in John Dewey, George Herbert Mead, and in Bank Street's developmental-interaction approach, as Vygotsky was trying to understand how structures of thought arise in a social context. Through the experimental application of Vygotskian theory, many of the tenets of progressive education formulated elsewhere in the world receive validation. At the same time, the experimental application of theory may have created a gap between practitioners and theoreticians, which is only now being bridged.

In this chapter, essential correspondences between Vygotskian principles and a developmental-interaction perspective are drawn. In particular, I discuss the shaping of experience by culture, the collaborative construction of knowledge, and the function of learning tools. To begin, I will outline some facets of Vygotskian theory.

What Does Vygotskian Theory Address?

At the time that Vygotsky did his writing, the Soviet Union was in its adolescence, not quite new but not yet a fixed social system. Enthusiasm for social experimentation was still strong; restrictions on scholarship were beginning but not to the extent that later occurred. Scholars were interested in examining change on both the grand social scale and the individual scale. Proponents of the newer schools of thought supported the underlying Marxist view that material conditions affect people's potential to develop as human beings. New social relations between classes based on new modes of production, it was theorized, would have an impact on individual abilities.

When Vygotsky began studying psychology in the 1920s, it was to address questions of consciousness and to challenge the then-prevalent views of learning and consciousness as functions of physiological responses to conditioned stimuli. Vygotsky was interested in the mental tools that we employ in accomplishing abstraction, symbolic representation, complex cultural transmission, and reflection, the "higher order" thinking that Wundt, too, had studied

earlier. In other words, he saw the "signifying systems" of meaning that people develop as ultimately coming from a different material base than that of the Pavlovian model of stimulus-means (Minick 1987). He saw the internalization of social processes as the basis of thinking, thereby taking Soviet psychology in new directions.

Vygotsky collaborated with many colleagues and students and developed a corpus of theoretical and experimental work that has been added to since and applied in many domains.[1] In these related strands of work two things are clear: first, the theory has broad implications for understanding human intellectual functioning in a variety of settings; second, in such applications there are bound to be disparate interpretations of the basic theory.

The original theory is termed "cultural-historical" because of Vygotsky's emphasis on looking at development on multiple planes: short term or microgenetic, ontological, societal, and phylogenetic (Scribner 1985). That is, the theory addresses development during a single episode in an individual's life, over a lifespan, within a society that grows and changes in its language and customs, and in the evolution of the species. This tradition continues in the field of cultural psychology, which tries to understand how societies' practices mediate individual development and learning (Cole 1996).

The term *activity theory* is also applied to Vygotskian studies. It refers to work of the school that emphasizes goal formation and everyday activity as driving the development of mental processes.[2] In activity theory, a tool, following Marx and Engels and similar to Dewey, represents a functional system; that is, it embodies a set of practices of a particular society. It becomes a mediating device between the culture and the individual user or learner. An emphasis on how the activities and tools of work and daily living could be arranged to maximize human potential was studied in various Soviet social experiments. Activity theorists today look at the socially distributed use of mediators (Leontyev 1981). The mediators may include computers, pen and paper, or cocktail glasses (see Beach's study of bartending, 1985). Scribner (1984), for instance, looked at how milkmen develop a multibased arithmetic system to calculate quantities based on the crates and containers they handle. Tools include language and mediators include people. The term *sociocultural* psychology sometimes refers to Vygotskian work that focuses on specific mediated actions, primarily language use. The cultural tool of language is central in sociocultural psychology because it is said to be the primary tool of enculturation and ontogenic development (Wertsch 1985).

For the purposes of this chapter, I discuss the ways in which the basic cultural-historical theory corresponds to the developmental-interaction approach and, selectively, where studies in education from more recent traditions extend that correspondence. I will organize the comparisons around what could be agreed by followers of any of the schools mentioned above, to be three central Vygotskian tenets: (1) the social origins of mental processes; (2) mediation by tools and signs; and, (3) the "genetic" approach to studying development. They are briefly summarized below.

The social origins of mental processes

Vygotsky, unlike most Western psychologists at the time and since, saw the individual developing as a consequence of social experience. People's psychological makeup represents an internalization of these socially constituted, mediated relations, a stance that Dewey, Mead, and Vygotsky share. V. V. Davydov (1988), in fact, said that psychological functions are reconstituted from social and physical elements by individuals as images, goals, and expressions.

This premise is Vygotskian developmental theory's axiomatic proposition; the others follow from it. Vygotsky's view of development and learning is rooted in this view. There is no development outside a social context; human culture and societies have universal and specific effects on the evolution of the mind; human interaction is related to psychological development: relations between people are internalized and assimilated by the child.

A "strong" interpretation of the theory would predict that the very structures of the brain would be affected by the availability of certain cognitive tools, for example, writing systems (Goody 1977) or computers (Papert 1980). Since these tools offset the cognitive "load" for the thinker, they may allow other forms of mental processing to develop. So, a writing system, the claim goes, relieves the memory load for people and allows them to develop more complex logic or argumentation. In fact, experimental evidence does not support the "strong" theory. Rather, cognitive skills have been found to be tied to specific cultural practices (Scribner and Cole 1981). Logical abstraction in particular has been shown to be related to Western-style schooling practices (LCHC 1982). Moreover, cross-cultural studies do not support Piaget's notion of universal structures of thought (Newman, Riel, and Martin 1983) because most of the variation in performance on Piagetian tasks can be accounted for by differences in experi-

ence (LCHC 1983). Studies show, however, that the specific experiences different societies offer their children have much in common as well as much that is unique. This can account for differences in the ages at which children acquire certain basic skills. While all children learn to walk, some do it earlier because of parents' handling techniques. In the cognitive domain, mastery of the relationships of grammar, possible in a universal window of time, depends on the syntactic structure of the particular language (Slobin 1982).

Following this, a Vygotskian analytic approach necessitates a "multilevel methodology" (Cole 1996) to explain mental performance (Cole 1995; Martin and Scribner 1991). That is, the nature of the influences on development require an interdisciplinary approach to studying learning to capture the critical variables at work. In the Soviet Union, this meant bringing philosophy, history, and psychology together, or neurology and sociology (Luria 1973). In the academic and experimental settings of Western universities, it has meant applying methods of anthropology, linguistics, and sociology as well as psychology to studies of learning (Cole 1996; Greenfield and Cocking 1994; Mehan 1979). Some lovely studies in this tradition, for example, have looked at how skilled but unschooled workers impart their skills to apprentices (Lave 1977); or mothers assisting their babies to learn patterns of interaction (Rogoff 1990; Wertsch, Minick, and Arns 1981); and how children function in their homes and in their schoolrooms (Heath 1983), and in their play (Serpell 1976).

At the same time that cross-cultural studies in the Vygotskian tradition were beginning to challenge the apparent bedrock of Piagetian thought, during the 1970s and 1980s, cognitive developmental psychology was coming into its own. Working with paradigms from adult experimental research, developmentalists were finding evidence of universal structures of thought and schemas that seemed to emerge with time and become more complex with age (Siegler 1978). But there were also challenges to those findings. Experience, once again, could account for the simpler structures of young children (Donaldson 1978; Gelman and Gallistel 1978; Spelke 1979). Child-rearing practices could account for some of the differences between members of different societies, although the relation is not simple (Cole 1996), and some seemingly "hard-wired" perceptual functions were found to be activated, not necessarily emergent (Imbert 1985). So, for instance, while we may be wired for depth perception, an infant still needs experience in three-dimensional space to develop its use to a functional level.

Another set of problems for the cognitive way of viewing the development of thinking and learning processes lay in the experimental method. Many studies, starting in the Soviet Union (Istomina 1948), found that children will perform differently on analogous problems under different circumstances (see Labov 1972). Now, most research on child development and learning takes place at universities where experimental control in research studies is the standard. Yet, some of the most important evidence for questioning established findings came from nonlaboratory settings where variance and noise, exposure and replication are hard to control. Vygotskian theory addresses these problems while cognitive theory does not.

While problems with the cognitive paradigms were encountered by some developmental psychologists, a critical one was not addressed until recently: the view that the individual mind is the unit of analysis, that thinking takes place inside one person's head and must be studied as such. Cultural-historical theorists have long debated the unit of analysis problem but they all agree that activity is the basic starting point. This involves several assumptions. There is an actor or agent with a goal, and a mediating structure such as a material tool, a social pattern, or another individual. The unit is not a specific action (such as solving a problem), the use of a tool (such as a computer), or a mental process (such as retrieving a memory); it is the relation between all of these. An activity can be considered to have any starting point and any ending; it is a functional unit that depends on the goals that motivated the actors. Moreover, activity is usually driven by multiple goals simultaneously. In a study of machinists, for example, workers making a part had many goals in mind: finishing the job on time, avoiding tool breakage, solving a particular technical problem, avoiding dangerous conditions, not exceeding budget, and more (Martin and Scribner 1991). What this means in activity theory is that the particular mental actions involved in machining a part (such as doing a trigonometry calculation) are determined by all of these goals and by the affordances of the context: what tools are available, who is around to help, the machinist's past experiences. In other words, the problem (making a part) does not exist by itself except by a formal—and invalid—definition. The problem, rather, can be perceived and construed only with respect to the specific circumstances. To paraphrase Lave, the environment constructs the problem (Lave, Murtaugh, and de la Rocha 1984).

Thus, one can see how understanding social and historical context is crucial in a Vygotskian account of psychological development. Cognitive psychologists have recognized an aspect of this in what they term "situated cognition," or cognitive processes in specific contexts. To fully understand development, however, the shared origins of the psychological functions need to be explicated and methods must be developed to study the interface of activity, practice, and intellectual functioning.

Mediation by tools and signs

Very little in the human experience is not mediated by culture. Some direct interactions with the natural world (such as experiencing gravity) may be unmediated, but even the patterns of exposure to the natural world vary among societies. For example, in some societies babies are carried throughout the day and in others they are set on their backs, in some cases supported or sometimes not, giving them different experiences of gravity. These practices result in a certain amount of variation in babies' motor development.

More central to the development of the human species' unique "higher order thinking"—abstraction, memory, logic, and so forth—are physical tools that assist performance and language that allows us to build on past experiences efficiently and to enculturate new generations. Furthermore, social order is reproduced by cultural tool use, as we see in classrooms where teachers replicate the interaction patterns of their own teachers.

Mediation is a critical mechanism by which to understand development. The material tools, the practices, social configurations, and sign systems of a culture form the substrate for both a society's development and an individual's. As individuals participate in or come to internalize practices, they transform them. They reproduce them, not exactly but uniquely, and so continue the development of the culture. It is a dialectical process: as society produces individuals, individuals produce society.

Again, the first challenges to traditional theories about mind came from cross-cultural work by Bruner, Cole, and others. Researchers found that when they presented Piagetian tasks to non-Western subjects, adult subjects often showed that they had not developed to the stage of concrete operations. Earlier work by Luria in newly annexed Soviet republics with tasks of logical abstraction showed similar findings (which were suppressed at

the time; see Cole 1996 for a later interpretation). However, when experimenters used indigenous materials with non-Western subjects or when non-school skills were studied, the absurdity of the Eurocentric interpretation became apparent: subjects performed logically and in complex fashion but not in the terms normally assigned as logical by those who studied them. Cross-cultural comparisons are not a simple story by any means—there is no direct relation between practices and performance or "cognitive styles" (Cole 1996)—but we can say that Western schooling, its discourse patterns and task demands, account for much of what has been seen as "adequate" performance on standard tests of cognitive ability.

In every society, children come to learn and to be able to make use of tools to solve problems; as they grow, they internalize the mediating properties of the tools. This was shown in many studies of the early Soviet psychologists who looked at children's developing use of mnemonic devices. Leontyev (1981), for instance, conducted a study of how children come to make use of memory aids in an experimental task: picture cards that could assist in the recall of a list of spoken words. He found that children under age seven could not make use of the cards, and that the cards even depressed performance compared to that in a free recall condition. Older schoolchildren, though, made mnemonic use of the picture cards as associations to the words they needed to remember.

The role of language, sign systems, and the symbols of the written word are central to a theory of development. Since language is regarded as a uniquely human achievement, it is a necessary mediator for learning ideas that go beyond labels attached to objects and experiences in our immediate environment. It makes the difference between concrete thinking and abstraction. Vygotsky, who created what we know as "attribute blocks," used these objects experimentally to study how children integrate verbal labels with categories of abstract properties. His interest was in the use of language as a tool of abstraction or higher-order thinking. The blocks, which varied in size or shape or colors, had nonsense word labels hidden on their undersides. He found that younger children had to turn over each block to find the label that declared it to be a member of a particular category. Older children could deduce that an attribute put certain blocks together in a particular category, and could use the nonsense terms, or signs, to sort the blocks. Some educators currently working in Russia and elsewhere have elaborated these theories in designing curriculum. The work has

been applied to language learning (Aidarova 1982), science (Rubtsov 1991), social studies (Hedegaard 1995), and mathematics (Davydov 1975).

V. V. Davydov, a mathematics specialist and leading Vygotskian thinker, showed that children are capable of abstract thought, namely, algebra, in the earliest grades if the material and mediating conditions are arranged properly. Davydov described three general phases to this process that correspond to general aspects of activity: orientation to a task, problem solving activity, and reflection. Orientation refers to how the learning task is presented to the children and understood by them. In their studies, the teacher chooses a concept to teach and organizes the hands-on materials and tasks in a very structured manner, designed to elicit discrepancies. More than that, though, in the problem-solving activity small groups of children are assigned goals to accomplish that will confront them with contradictions in the materials. For example, children who do not classify (in Piaget's sense) are asked to place tokens with shared properties (e.g., round wooden tokens and round metal tokens) in spaces on a Venn diagram map. In the problem-solving phase, the manipulation of the tokens for the goal of accomplishing the mapping causes children to argue that their token belongs in a particular space; eventually, they recognize that both the wooden tokens and the metal tokens can be placed in the space for "round."

Hands-on activity, however, is not enough for learning in Davydov's approach. Just having materials to manipulate does not allow the children to internalize their abstract properties. The next step, therefore, is to have the children create a generalized representation of the problem—in a picture, chart, diagram, graph, or verbal record. In doing so, they represent the abstracted relations between the objects. As they discuss their representations, they can learn the relations apart from the actual objects. They can reflect on their experiences, learn a new orientation to the problem, and become conscious of their learning.

The genetic approach

This idea refers to how Vygotsky studied development. Because of his claims of the social origins of thinking and of the role of mediation, Vygotsky insisted that looking at a performance snapshot or *product* of development did not capture its essence. Instead, the

process of development needs to be studied. Vygotsky himself outlined four planes of development that interact: those of the species, of the culture, of an individual's lifetime, and of an individual at a particular occasion, or microgenesis (see Scribner 1985; Tobach 1995).

The premise of the genetic approach presents large challenges to traditional methods of research, and not simply to experimental methodology. One of Vygotsky's criticisms of Piaget was that in his clinical method, Piaget did not take the experimenter's role into account when analyzing the subject's performance. The critique is a profound one because not only does it say that the traditional unit of analysis (the individual child's head) is not valid, but also that there is no way to obtain a picture of what a child "knows." In interaction with others, each person is being changed: they construct knowledge together. As you might imagine from the points made earlier, according to this framework, every encounter is a learning encounter. Thus, "Vygotsky's conception of development is at the same time a theory of education" (Bruner 1962).

The term "zone of proximal development" is by now familiar to educators. When we understand the primacy of the genetic approach to Vygotsky's view of development, the concept of the zone becomes obvious. It refers to what a child can accomplish, not alone, but in interaction with a more knowledgeable person. It looks at how a child makes use of mediators and what the more skilled person needs to do to support the learner's progress. In his clinical method Piaget sets up a situation where this may be studied, but his theory does not allow him to do this. Meanwhile, a child undergoing such an interview may be learning a lot about test taking, complying with adults, performing an arbitrary task, all of which can influence performance, as cross-cultural studies uncovered.

While Vygotskian theory does not provide benchmarks for establishing "zones" the way Western developmental psychology might, it does underscore the significance of our interactions with children and the import of everyday encounters to learning. Since every interaction teaches, the way teachers relate to their students is critical in the learning process. The wisdom of the developmental-interaction approach perfectly instantiates the seriousness of this premise. When the Bank Street Graduate School of Education teaches teachers to observe and record children's behavior, to reflect on their own roles as guides, and to examine their relationships with the growing child, it could be said to promote a genetic approach (see Haberman, Silin, this volume).

Development and Learning

An important dialogue has been in progress for a while in this country about the difference between development and learning. In addressing the question, developmentalists tend to look for "hardwired" capacities in the organism, such as the ability to categorize, and how the environment affords their use. They may also look at the structure of a knowledge domain and how novices and experts differ in the mental tools they apply in processing them. Educational programs based on a classical developmental approach try to build skills sequentially, taking into account children's capacities. Unlike Dewey, they assume that consistency lies in the subject matter, not in the students' experience, and therefore a fractionated curriculum is taught.

In contrast, the genetic approach and the multileveled nature of development in general means that the learning setting, be it experimental or naturally occurring, is part of the analysis. What the learner, the teacher, and the traditions bring to the table are always considered. This is the key to balancing "long-standing attention to individual development with elaboration of context" that Shapiro and Nager cite (this volume). A curriculum in this framework would relate to students' experience, build on their strengths, and take into account the role of the materials and of the teacher. This, in fact, is Bank Street's developmental-interaction approach.

The idea of integrating knowledge domains across the curriculum, which is taught in the core curriculum process, reflects better how people actually think. It thus may provide a better learning base upon which children can elaborate abstract concepts. Another feature of a developmental-interaction approach in the classroom is concern for the affective climate of school. I would argue that most educational theory is concerned with how negative affect may block students' intellectual functioning or how to socialize children in a nonantagonistic way to the norms of school. I would also argue that the developmental-interaction approach means respecting students' experiences to a greater degree and respecting what they contribute to the construction of the class environment.

We all are in the business of socializing children, but some of us take more reflective responsibility for that role. Distinguishing between learning and development may lead to a dismissal of responsibility on the part of some educators, since it seems to have led to a deterministic explanation of why certain children fail. The early Soviets may have had too simple a faith in how a new society

could remake humanity, but at least their psychologists pushed hard to get us to see that we can make a difference.

Why Vygotsky and Developmental-Interaction Have Not Previously Been Linked

One of the reasons that Vygotsky's work has not been associated with such progressive educational frameworks as developmental-interaction is simply that it was not available. The first English-language book of his to appear was *Language and Thought* in 1962, although articles by Soviet developmental psychologists had appeared earlier from time to time in the West. In fact, until recently, Vygotsky's works were not even available in Russian. Only in the late 1970s and mid-1980s did his collected works begin appearing.

Notable exceptions are found in Jerome Bruner's work, which did reach teachers, and had an effect on curriculum design, as well as some less-known work such as Brenda Lansdown's in science instruction (Lansdown, Blackwood and Brandwein, 1971). Bank Street College School for Children and Graduate School in fact, embraced both of these Vygotskian approaches during the 1960s and 1970s, but school systems in general did not.

Since the 1960s, Piaget's theories have found a great audience among researchers studying cognition since his work on the mind was also based on formal structural models. The domains Piaget studied, particularly the structure of actions and the development of logico-mathematical reasoning were of interest, I believe, because our society values performance in these abstract domains as the pinnacle of formal learning. Educators, who looked for more theoretical grounding for their practices, began to incorporate Piagetian principles into their discourse. Piagetian curricula started appearing. Piagetian experimental materials began to be used as classroom equipment. In my experience, practitioners of the Bank Street school joined the dialogue somewhat reluctantly, recognizing that thinking skills develop systematically, but less ready to accept that thought is logically structured to such a degree.

Another reason for the disconnect between the cultural-historical (Vygotskian) and developmental-interaction is that Vygotksian work has been centered at universities. Academics had ownership of the ideas before practitioners, and the ideas were isolated from practice. At first, Vygotskian work fell into the provenance of developmental psychology, because that was the background of those

who introduced the work here (notably Bruner, Cole, and Wertsch) at labs such as the Laboratory for Comparative Human Cognition. As studies adopting the approach multiplied and became more overtly interdisciplinary, their challenge to traditional experimental methods became more prominent. They have had, in fact, a major impact on how development is currently studied.

With respect to individual psychology, the developmental-interaction approach was informed most by psychodynamic theory and humanist psychology. Although Vygotsky had read Lewin, Ach, and other German psychologists, his theory did not incorporate theirs to any significant degree. Because of this the two approaches had less chance to be integrated. The psychodynamic implies an emphasis on teacher-student interpersonal dynamics, on affect as a major component of the learning situation, on psychosocial stages of growth, on symbolic meaning and unconscious mechanisms. Practitioners trained in this approach are sensitive to individual children and to their own roles. All this is consistent with a Vygotskian framework; however, researchers have tended to reject psychodynamic theory because it does not depend on experimental evidence. In trying to convince skeptics of the value of humanistic educational models—for instance, the Head Start model—methodological problems for developmental-interaction existed because traditional psychometrics or educational outcome measures are inappropriate for capturing their impact.

Another reason for the disconnect has to do with the relation between applications of developmental psychology and educational practices. It is only recently that developmentalists have seen the necessity of "design experiments" that involve them in an ongoing way with an institution or group in the process of changing (Brown 1992; Cole 1996; Newman, Griffin, and Cole 1989; Rogoff, Radziszewska, and Masiello 1995). It is only recently, too, that cultural-historical psychologists have looked at the practices of developmental psychology and how they relate to instruction in our society (Cole 1996; Hedegaard 1995; Serpell 1995).

Why Are We Interested in Vygotsky?

Vygotskian theory gives theoretical and experimental support to the developmental-interaction approach. It is consistent with some of that approach's foundational tenets regarding the experiential basis of learning. Both assume the social origins of knowledge and the collaborative construction of knowledge. Both assume that

learning is social and shaped by the child's experience, which is determined by the society. Both view the function of learning tools as critical mediators in an educational setting and both support the significance of microgenetic development in a valid account of learning.

Vygotskian theory, furthermore, addresses the problems of cognitive models which also pose problems for developmental-interaction. The notion of the individual mind with fixed mental structures as a unit of analysis, characteristic of cognitive approaches, puts limits on how educational practices can evolve. It creates the limits because it ultimately locates development in the student not in the learning environment. It absolves teachers of the responsibility of establishing "zones" that work. This becomes dangerous when we try and account for cross-cultural differences in performance at school, or unpackage a "deficit" model of performance for children in low socioeconomic strata, or demonstrate why the teacher's role is so complex. Vygtoskian theory, however, gives us a guide. It has made sense of some of the paradoxes we have encountered in traditional educational research.

Differences also exist between the approaches. Vygtosky's work grew from a Marxist view of historical materialism while developmental-interaction is more ahistorical and Freudian. In a historical-cultural framework, the goals of a child's activity are not seen as "free" as in Dewey's understanding—they are culturally mediated. Second, although Vygotsky was interested in the "whole" child and in affect, these are not a focus of experiments in his tradition nor are constructs such as ego, individuality, and self-actualization. Finally, for Vygotsky, knowledge and practice are continually evolving, which puts a focus on the role of societal changes in education. In my experience the Bank Street model of practice seems to make broader claims about its appropriateness and relevance, suggesting that there is a universal model of educational practice.

Cultural-historical theory does not offer a prescription for classroom practice. As researchers working in this tradition move their studies more and more to the real-life settings of the school, home, museum, and so forth, we gain broader common ground to examine alongside practitioners of the developmental-interaction approach.

What Is to Be Done?

There are several key arenas where a Vygotskian perspective can add to the developmental-interaction approach so that it can "con-

tinue to provide a framework for educational practice" (Shapiro and Nager, this volume). The arenas are ones that are currently being discussed by educators and developmental researchers alike.

New learning tools

Because of its emphasis on cultural tools, as new technologies and new types of learning communities flourish (Brown and Campione 1990; Rogoff 1994), Vygotksian theory can help us understand their cognitive consequences. In applying Vygotskian theory to understanding the transformation of information delivery systems, proponents of developmental-interaction can address questions about the value of new technologies.

Children's experiences outside of school

We are recognizing more and more that significant learning takes place outside the school walls, in families and communities, and in leisure time. Because Vygotskian theory is not specifically school-based, it can help us understand more of what the child brings to the classroom from home. It can also stretch the application of developmental-interaction to nonschool domains of learning.

The impact of new family configurations

Part of the trend in new learning environments involves what are termed nontraditional families. Researchers and educators are interested in how different caregiving configurations affect children's development (see Wasow, this volume). It would be valuable to apply cultural-historical approaches to explore the role that family configuration may or may not play in school readiness and performance.

Concerns about how children learn values

The developmental-interaction approach does not claim to be value-free. In fact, following Dewey, it holds that education that promotes mental and moral growth is what is authentic in a democratic society. Dewey (1938) wrote that only if an education promotes further growth is it worthy of the label "education."

If we are to understand how to construct learning environments that permit genuine development in Dewey's sense, we need to base our choices in a theory that considers the role of the larger society, the role of an individual's experiences, and the role of educators. Vygotskian theory inherently addresses some of these elements in supporting the notion that growth happens as a result of interpersonal exchange. It implies that problems of moral growth, for instance, are analyzable and remediable.

Trends in school experience affecting public discourse on education and their impact on the school experience

Several recent studies have argued that support for the public school system in our country is declining, primarily because of unfounded criticisms of their performance (Berliner and Biddle 1996) or misconceptions about the effectiveness of alternatives (Ascher, Fruchter, and Berne 1997). Ascher et al. point out that since public education provides the common experience and ground for discourse that citizens of our country have shared, its erosion has potentially dangerous consequences. Since a democratic society is not merely a collection of unintegrated viewpoints, the common ground needs nurturing. A theory and practice that allow the possibility of multiple routes to a desired outcome while placing responsibility for the outcome on society are strong tools for that cultivation. The developmental-interaction and cultural-historical approaches can and should address these social developments and tackle the issue of what is happening to the meaning of public education.

Methodology

Happily, the wisdom of case studies, of sociolinguistic analysis, and of ethnographic methods in the study of development and learning is beginning to be regarded as legitimate in academic psychology. In a sense, these methods have always been the tool of practitioners, who have much to teach theorists about reading the nuances of instructional interactions and about educational tools and settings (see Paley 1981). And theory can support intuition. It can further applied work by enhancing the predictability of its models; it can inspire new practices. This is true for museum learning research (Schauble, Leinhardt, and Martin 1998), early childhood program research, and school studies.

Since many of the fundamental assumptions of developmental-interaction and cultural-historical analysis are comparable, dialogue between the two traditions is especially productive. We are working with theoretical and practical approaches that both posit the cultural basis of the mind. As our practices grow together, our ability to interpret development and learning will inevitably be strengthened, for the greater good of our society and its children.

---------- NOTES ----------

Thanks to Richard Toon for comments and suggestions on the chapter.

1. Early on, his colleagues applied the theory to practical problems facing the Soviet Union (Wertsch 1985) in their work on learning disabilities (Luria 1973; Mescheryakov 1974), learning (Gal'perin 1969), the functions of play (El'konin 1969), and cognition in different cultures (Luria 1976). More recently, his work has been interpreted and applied to studies of group performance (Lomov 1978), workplace learning (Scribner 1984), language development (Markova 1979), and preschool program design (Zaporozhets 1969). Most recently, his adherents have applied this approach to look at school curricula (Aidarova 1982; Davydov 1975), basic problem solving (Rubtsov 1991), learning outside of schools (Moll and Greenberg 1990), indigenous thinking systems (Beach 1993; Saxe 1981), IQ (LCHC 1983), work activity (Engestrom 1995), and semiotics (Wertsch 1991).

2. Although goals and activity are central concepts in Vygotsky's work, they are usually only implicit in his psychological studies (Wertsch 1985); activity theorists study these explicitly.

---------- REFERENCES ----------

Aidarova, L. (1982). *Child development and education.* Moscow: Progress Publishers.

Ascher, C., N. Fruchter, and R. Berne (1997). *Hard lessons: Public schools and privatization.* New York: Twentieth Century Fund.

Beach, K. D. (1993). Becoming a bartender: The role of external memory cues in a work-directed educational activity. *Applied Cognitive Psychology* 7: 191–204.

Berliner, D. C., and B. J. Biddle (1996). *The manufactured crisis: Myths, fraud, and the attack on America's public schools.* New York: Addison Wesley.

Brown, A. L. (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *Journal of Learning Sciences* 2: 141–178.

Brown, A. L., and J. C. Campione (1990). Communities of learning and thinking, or a context by any other name. In D. Kuhn (Ed.), *Developmental perspectives on teaching and learning thinking skills. Contributions to Human Development* 21: 108–126. Basel: Karger.

Bruner, J. S. (1962). Introduction to L. S. Vygotsky, *Thought and language.* Cambridge, MA: The MIT Press.

Cole, M. (1996). *Cultural psychology: A once and future discipline.* Cambridge, MA: Harvard University Press.

Davydov, V. V. (1975). Logical and psychological problems of elementary mathematics as an academic subject. In E. G. Begle, J. Kilpatrick, J. W. Wilson, and I. Wirszup (Eds.), *Soviet studies in the psychology of learning and teaching mathematics* (vol. 7). Chicago: University of Chicago Press.

Davydov, V. V. (1988). Problems of developmental teaching: The experience of theoretical and experimental psychological research. *Soviet Education* 30 (whole issue).

Dewey, J. (1938). *Education and experience.* New York: Collier Books.

Donaldson, M. (1978). *Children's minds.* New York: Norton.

El'konin, D. B. (1969). Some results of the study of the psychological development of preschool-age children. In M. Cole and I. Maltzman (Eds.), *A handbook of contemporary Soviet psychology.* New York: Basic Books.

Engestrom, Y. (1995). Innovative organizational learning in legal and medical settings. In L. M. W. Martin, K. Nelson, and E. Tobach (Eds.), *Sociocultural psychology: Theory and practice of doing and knowing.* New York: Cambridge University Press.

Gal'perin, P. Y. (1969). Stages in the development of mental acts. In M. Cole and I. Maltzman (Eds.), *A handbook of contemporary Soviet psychology.* New York: Basic Books.

Gelman, R., and C. R. Gallistel (1978). *The child's understanding of number.* Cambridge, MA: Harvard University Press.

Goody, J. (1977). *The domestication of the savage mind.* New York: Cambridge University Press.

Greenfield, P. M., and R. Cocking (1994). Preface to P. M. Greenfield and R. Cocking (Eds.), *Cross-cultural roots of minority child development.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Heath, S. B. (1983). *Ways with words: Language, life, and work in communities and classrooms.* New York: Cambridge University Press.

Hedegaard, M. (1995). A qualitative analysis of the development of a child's theoretical knowledge and thinking. In L. M. W. Martin, K. Nelson, and E. Tobach (Eds.), *Sociocultural psychology: Theory and practice of doing and knowing.* New York: Cambridge University Press.

Imbert, M. (1985). Physiological underpinnings of perceptual development. In Mehler, J., and R. Fox. *Neonate cognition: Beyond the blooming buzzing confusion.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Istomina, Z. M. (1948). The development of voluntary memory in preschool children. *Soviet Psychology* 13: 5–64.

Laboratory of Comparative Human Cognition (1983). Culture and cognition. In P. Mussen (Ed.), *Handbook of child psychology,* vol 1: *History, theory, methods.* New York: John Wiley & Sons.

Laboratory of Comparative Human Cognition. (1982). Intelligence as cultural practice. In R. Sternberg (Ed.), *Handbook of human intelligence.* San Francisco: Jossey-Bass.

Labov, W. (1972). The logic of non-standard English. In F. Williams (Ed.), *Language and poverty.* Chicago: Markham.

Lansdown, B., P. E. Blackwood, and P. F. Brandwein (1971). *Teaching elementary science through investigation and colloquium.* New York: Harcourt Brace Jovanovich.

Lave, J. (1977). Tailor-made experiments and evaluating the intellectual consequences of apprenticeship training. *Quarterly Newsletter of the Laboratory of Comparative Human Cognition* 1: 1–3.

Lave, J., M. Murtaugh, and O. de la Rocha (1984). The dialectic of arithmetic in grocery shopping. In B. Rogoff and J. Lave (Eds.), *Everyday cognition: Its development in social context.* Cambridge, MA: Harvard University Press.

Leontyev, A. N. (1981). *Problems of the development of the mind.* Moscow: Progress Publishers.

Lomov, B. F. (1978). Psychological processes and communication. *Soviet Psychology* 17: 3–22.

Luria, A. R. (1976). *Cognitive development.* Cambridge, MA: Harvard University Press.

Luria, A. R. (1973). *The working brain.* New York: Basic Books.

Markova, A. K. (1979). *The teaching and mastering of language.* White Plains, NY: M.E. Sharpe.

Martin, L. M. W., and S. Scribner (1991). Laboratory for Cognitive Studies of Work: A case study of the intellectual implications of a new technology. *Teachers College Record* 92: 582–602.

Mehan, H. B. (1979). *Learning lessons.* Cambridge, MA: Harvard University Press.

Mescheryakov, A. (1974). *Awakening to life.* Moscow: Progress Publishers.

Minick, N. (1987). Introduction to *The collected works of L. S. Vygotsky: vol. 1. Problems of general psychology*. New York: Plenum Press.

Moll, L. C., and J. B. Greenberg (1990). Creating zones of possibilities: Combining social contexts for instruction. In L. C. Moll (Ed.), *Vygotsky and education*. New York: Cambridge University Press.

Newman, D., P. Griffin, and M. Cole (1989). *The construction zone: Working for cognitive change in school*. New York: Cambridge University Press.

Newman, D., M. Riel, and L. M. W. Martin (1983). Cultural practices and Piagetian theory: The impact of a cross-cultural research program. In D. Kuhn and J. A. Meacham (Eds.), *On the development of developmental psychology*. Basel: Karger.

Paley, V. G. (1981). *Wally's stories*. Cambridge, MA: Harvard University Press.

Papert, S. (1980). *Mindstorms: Children, computers, and powerful ideas*. New York: Basic Books.

Rogoff, B., B. Radziszewska, and T. Masiello (1995). Analysis of developmental processes in sociocultural activity. In L. M. W. Martin, K. Nelson, and E. Tobach (Eds.), *Sociocultural psychology: Theory and practice of doing and knowing*. New York: Cambridge University Press.

Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context*. New York: Oxford University Press.

Rogoff, B. (1994). Developing understanding of the idea of communities of learners. *Mind, Culture, and Activity* 1: 209–229.

Rubtsov, V. V. (1991). *Learning in children: Organization and development of cooperative actions*. Commack, NY: Nova Science Publishers.

Saxe, G. B. (1981). Body parts as numerals: A developmental analysis of numeration among a village population in Papua New Guinea. *Child Development* 52: 306–316.

Schauble, L., G. Leinhardt, and L. Martin (1998). A framework for organizing a cumulative research agenda in informal learning contexts. *Journal of Museum Education* 22:3–8.

Scribner, S. (1985) Vygotsky's uses of history. In J. V. Wertsch (Ed.), *Culture, communication, and cognition: Vygotskian perspectives*. New York: Cambridge University Press.

Scribner, S. (1984). Cognitive studies of work. *Quarterly Newsletter of the Laboratory of Comparative Human Cognition*, nos. 1 and 2.

Scribner, S., and M. Cole (1981). *The psychology of literacy*. Cambridge, MA: Harvard University Press.

Serpell, R. (1976). *Culture's influence on behavior*. London: Methuen.

Serpell, R. (1995). Situated theory as a bridge between psychology, history, and educational practices. In L. M. W. Martin, K. Nelson, and E. Tobach (Eds.), *Sociocultural psychology: Theory and practice of doing and knowing*. New York: Cambridge University Press.

Siegler, R. (Ed.) (1978). *Children's thinking: What develops?* Hillsdale, NJ: Lawrence Erlbaum Associates.

Slobin, D. I. (1982). Universal and particular in the acquisition of language. In E. Wanner and L. R. Gleitman (Eds.), *Language acquisition: The state of the art*. New York: Cambridge University Press.

Spelke, E. S. (1979). Exploring audio and visual events in infancy. In A. D. Pick (Ed.), *Perception and its development: A tribute to Eleanor Gibson*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Tobach, E. (1995). The uniqueness of human labor. In L. M. W. Martin, K. Nelson, and E. Tobach (Eds.), *Sociocultural psychology: Theory and practice of doing and knowing*. New York: Cambridge University Press.

Wertsch, J. V. (1991). *Voices of the mind: A sociocultural approach to mediated action*. Cambridge, MA: Harvard University Press.

Wertsch, J. V. (1985). *Vygotsky and the social formation of mind*. Cambridge, MA: Harvard University Press.

Wertsch, J. V., N. Minick, and F. J. Arns (1981). The creation of context in joint problem solving action: A cross-cultural study. Paper presented at the SRCD study group, *The social context of the development of everyday skills*, Laguna Beach, CA.

Zaporozhetz, A. V. (1969). Some of the psychological problems of sensory training in early childhood and the preschool period. In M. Cole and I. I. Maltzman (Eds.), *A handbook of contemporary Soviet psychology*. New York: Basic Books.

Revisiting

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Progressive Pedagogy

The Developmental-Interaction Approach

Edited by
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