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Sociocultural Approaches to Learning and Development: A Vygotskian Framework

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Sociocultural approaches emphasize the interdependence of social and individual processes in the coconstruction of knowledge. This article uses three central tenets of a Vygotskian framework to examine the relation between learning and development: (a) social sources of individual development, (b) semiotic (signs and symbols, including language) mediation in human development, and (c) genetic (developmental) analysis. The role played by culture and language in human development is an essential aspect of the Vygotskian framework and provides an overarching theme for this article. The methodological foundation of this framework is examined, particularly as it contrasts with other perspectives on the process of internalization of social interaction in the construction of knowledge. The article concludes by surveying sociocultural research on and applications to classroom learning and teaching, particularly that which examines the role of collaboration.

It is significant that this special issue of ***Educational Psychologist*** contains an article on sociocultural theory on the centenary of the birth of its founder, the Russian psychologist Lev Vygotsky. In the last few decades there has been increasing interest in this theory and its implications for research on classroom learning and teaching. There is a range of interpretations and applications of sociocultural approaches, reflecting the vitality of this perspective.[1] Nevertheless, some common assumptions of the sociocultural community have been refined and clarified by contemporary scholars based on Vygotsky's original writings. A number of sources provide overviews of these approaches and reflect the varied interpretations of Vygotsky's theory (Cole & Scribner, 1978; John-Steiner & Souberman, 1978; van der Veer & Valsiner, 1991; Wertsch, 1985, 1991).

To examine the central concepts of sociocultural theory, the methodological foundations should be analyzed. The dialectical method Vygotsky used differentiates it from other perspectives presented in this issue. We focus on the differences between social constructivist and sociocultural approaches because these two perspectives are often associated, resulting in confusion about their similarities and differences.

This article consists of three main sections: (a) a brief overview of sociocultural approaches, (b) an examination of sociocultural methodology, and (c) an overview of sociocultural contributions to research and applications to classroom learning and teaching. An overarching focus is the interdependence of social and individual processes in the coconstruction of knowledge. This focus clarifies the differences between sociocultural theories based on Vygotsky's contributions and other perspectives reviewed in this issue.

AN OVERVIEW OF SOCIOCULTURAL THEORY

Sociocultural approaches to learning and development were first systematized and applied by Vygotsky and his collaborators in Russia in the 1920s and 1930s. They are based on the concept that human activities take place in cultural contexts, are mediated by language and other symbol systems, and can be best understood when investigated in their historical development. At a time when psychologists were intent on developing simple explanations of human behavior, Vygotsky developed a rich, multifaceted theory through which

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[1] Vygotsky's works have been studied and interpreted by a variety of scholars, some of whom prefer to use the term ***cultural–historical.*** In this article, we refer broadly to the legacy of Vygotsky's work and the contributions to and interpretations of his theory as the *sociocultural* approach. Of particular significance in the various expansions of this framework are the contributions of activity theorists, including Leontiev (1978) and Engeström (1987, 1990). See the journal ***Mind, Culture, and Activity*** for the breadth of disciplines and countries represented by contributors to the sociocultural enterprise. ***Mind, Culture, and Activity*** is published four times a year by the Laboratory of Comparative Human Cognition, University of California, San Diego, La Jolla, CA 92093–0092. Fax: (619) 534–7746.

he examined a range of subjects including the psychology of art; language and thought; and learning and development, including a focus on the education of students with special needs. However, his work was suppressed for 20 years and did not become accessible again until the late 1950s and early 1960s. Since then, sociocultural approaches have gained increasing recognition and have been further developed by scholars in over a dozen countries. Contemporary interpretations and reinterpretations of Vygotsky's and his collaborators' work reflect the visibility and obscurity of this theory's 60-year existence. The expansions and interpretations in the last 25 years have led to diverse perspectives on sociocultural theory.

The dissemination of Vygotsky's ideas and the application of his work in diverse national contexts have contributed to "a complex of related but heterogeneous proposals" (Rogoff, Radziszewska, & Masiello, 1995, p. 125). Vygotsky's ideas are condensed and at times not fully developed because he died at a young age of tuberculosis. Much of his work remains untranslated into English. In spite of these difficulties, his theories are increasingly influential in Western countries. The impact of Vygotsky's ideas has grown substantially in the United States, particularly since the publioation of a selection of his writings in ***Mind in Society*** (Vygotsky, 1978).

The power of Vygotsky's ideas lies in his explanation of the dynamic interdependence of social and individual processes. He arrived at his views by analyzing the crisis in psychology he saw in the two predominant schools in the field, "each of which claim[ed] to possess an explanatory system adequate to became the basis of general psychology" (Kozulin, 1990, p. 87). In contrast to those approaches, which focused on internal or subjective experience, and behaviorist approaches, which focused on the external, ***Vygotsky conceptualized development as the transformation of socially shared activities into internalized processes.*** In this way he rejected the Cartesian dichotomy between, the internal and the external.

The nature of the interdependence between individual and social processes in the construction of knowledge can be clarified by examining three major themes in Vygotsky's writings highlighted by Wertsch (1991): (a) Individual development, including higher mental functioning, has its origins in social sources; (b) human action, on both the social and individual planes, is mediated by tools and signs; and (c) the first two themes are best examined through genetic, or developmental, analysis. In developing these themes, we rely on Vygotsky's writings as well as the elaborations of his ideas by his coworkers and scholars influenced by his work.

Social Sources of Development

Human development starts with dependence on caregivers. The developing individual relies on the vast pool of transmitted experiences of others. Vygotsky, in his well-known genetic law of development, emphasized this primacy of social interaction in human development:

> Every function in the cultural development of the child comes on the stage twice, in two respects; first in the social, later in the psychological, first in relations between people as an interpsychological category, afterwards within the child as an intrapsychological category. ... All higher psychological functions are internalized relationships of the social kind, and constitute the social structure of personality. (as cited in Yalsiner, 1987, p. 67)

This principle describes a process situated in, but not limited to, social interaction. When beginning an activity, learners depend on others with more experience. Over time they take on increasing responsibility for their own learning and participation in joint activity (Lave & Wenger, 1991). Expanding Vygotsky's genetic law of development, Rogoff (1990) characterized this process as guided participation. In her cross-cultural studies, she documented children's various forms of participation with parents and peers. Rogoff found that even when children were not conversational partners with adults, they were involved in the adult world as participants in adult agricultural and household work. She described the supportive engagement of Mayan mothers with their children as an example of the nonverbal guidance adults give children:

> The routine arrangements and interactions between children and their caregivers and companions provide children with thousands of opportunities to observe and participate in the skilled activities of their culture. Through repeated and varied experience in supported routine and challenging situations, children become skilled practitioners in the specific cognitive activities in their communities. (Rogoff, 1991, p. 351)

Thus, learners participate in a wide variety of joint activities that provide the opportunity for synthesizing several influences into the learner's novel modes of understanding and participation. By internalizing the effects of working together, the novice acquires useful strategies and crucial knowledge.

The acquisition of language provides another example of a social source of development. Zukow-Goldring and Ferko (1994) and other researchers showed the close relation between promoting shared attention between beginning speakers and their caregivers and the emergence of the lexicon. Contemporary research supports the sociocultural claim that the relationships between individuals forms a basis for cognitive and linguistic mastery. This process, whether in the classroom or elsewhere, includes transmission, construction, transaction, and transformation in a continuing, complex interplay.

Semiotic Mediation

Semiotic mediation is key to all aspects of knowledge coconstruction. For Vygotsky, semiotic mechanisms (including psychological tools) mediate social and individual functioning and connect the external and the internal, the social and the individual (Wertsch & Stone, 1985). Vygotsky (1981)

listed a number of examples of semiotic means: "language; various systems of counting; mnemonic techniques; algebraic symbol systems; works of art; writing; schemes, diagrams, maps and mechanical drawings; all sorts of conventional signs and so on" (p. 137). Other tools, increasingly recognized in sociocultural discourse—the paint brush, the computer, calendars, and symbol systems—are central to the appropriation of knowledge through representational activity by the developing individual.

In the introduction to Vygotsky's *Thought and Language,* Bruner (1962) described Vygotsky's view of the role of semiotic mediation:

> He believed that in mastering nature we master ourselves. For it is the internalization of overt action that makes thought, and particularly the internalization of external dialogue that brings the powerful tool of language to bear on the stream of thought. Man, if you will, is shaped by the tools and instruments that he comes to use, and neither the mind nor the hand alone can amount to much. ... And if neither hand nor intellect alone prevails, the tools and aids that do are the developing streams of internalized language and conceptual thought that sometimes run parallel and sometimes merge, each affecting the other. (p. vii)

Wertsch (1991) adopted Wittgenstein's metaphor of a socially provided tool kit of semiotic means. Those means and practices, which become internalized and available for independent activity, are critical in supporting and transforming mental functioning. Physical tools are directed toward the external world; psychological tools are directed internally and are appropriated during activity.

Knowledge is not internalized directly, but through the use of psychological tools. Vygotsky's colleague Leontiev (1981) used the term *appropriation* to describe the adoption by an individual of one of these socially available psychological tools and wrote that children

> cannot and need not reinvent the artifacts that have taken millennia to evolve in order to appropriate such objects into their own system of activity. The child has only come to an understanding that is adequate for using the culturally elaborated object in the novel life circumstances he encounters. (as cited in Newman, Griffin, & Cole, 1989, p. 63)

Leinhardt (1996), in her discussion of teaching–instructional explanations of mathematical concepts, provided another example of semiotic mediation. In describing the role of representations, she illustrated the concept *percent* by discussing various representations, such as number lines, circles, and squares. Representational activities, whether in the form of inner speech, imagery, or kinetic concepts, are linked to culturally shared systems, such as language, and to developmental activities, including scaffolding[2] (John-Steiner, 1995).

Thus, psychological tools are not invented by the individual in isolation. They are products of sociocultural evolution to which individuals have access by being actively engaged in the practices of their communities. In a recent article, Wertsch (1994) elaborated on the centrality of mediation in understanding Vygotsky's contributions to psychology and education:

> [Mediation] is the key in his approach to understanding how human mental functioning is tied to cultural, institutional, and historical settings since these settings shape and provide the cultural tools that are mastered by individuals to form this functioning. In this approach, the mediational means are what might be termed the "carriers" of sociocultural patterns and knowledge. (p. 204)

Cognitive pluralism. Although the importance of semiotic mediation in thinking is recognized by most members of the sociocultural thought community, inteqpretations of it differ. Almost all sociocultural researchers place language in a central position; however, some: consider that other semiotic means are of little theoretical interest (Kozulin, 1990). We claim a pluralistic rather than a monistic theory of semiotic mediation (John-Steiner, 1991, 1995) and coined the term *cognitive pluralism* for this stance. Evidence for cognitive pluralism includes the planning notes of experienced thinkers, which incorporate words, drawings, musical notes, and scientific diagrams (John-Steiner, 1985).

The diversity of these means and the psychological tools that they represent are of special interest to educators who work in multicultural settings and with children who have special needs. In an issue of *Educational Psychologist* devoted to Vygotsky's ideas, Gindis (1995) described the emphasis Vygotsky placed on the variety of psychological tools in approaching the study of children who had special physical or mental circumstances: "Vygotsky pointed out that our civilization has already developed different means (e.g., Braille system, sign language, lip reading, finger spelling, etc.) to accommodate a handicapped child's unique way of acculturation through acquiring various symbol systems" (p. 79).

These acts of representation are embedded in social practice and rely on socially developed semiotic means. Ecology, history, culture, and family organization play roles in patterning experience and events in the creation of knowledge (John-Steiner, 1995). For example, the: tasks confronting children, such as learning to talk, to walk, and to attach meaning to their experiences, are reflected in cognitive strategies derived in part from the culturally patterned environment into which they are born. Their thought is shaped by the prevalent methods of physical and economic survival, by the language and visual symbols used by their people, and by socially ordered

[2] As first used by Wood, Bruner, and Ross (1976), *scaffolding* is a metaphor for graduated assistance provided to the novice, akin to the carpenter's scaffold.

ways of parenting. Some children born into tribal or agricultural communities spend many hours strapped to the back of their mothers and other caregivers. In this position, they observe and represent the life of their community in a way that is not possible to children placed in cribs and playpens (John-Steiner, 1985)

Representational activities and the sociocultural theory of semiotic mediation are fundamental to Vygotsky's concept of internalization and the transformation of interpersonal processes into intrapersonal ones. Vygotsky used the concept of semiotic mediation to explain qualitative transformations in the human mind historically, ontogenetically, and microgenetically. The role played by semiotic mediation in the development of higher psychological processes provided a central focus for Vygotsky's research. The concept of semiotic mediation is essential to the sociocultural view that the process of internalization is transformative rather than transmissive.

Genetic Analysis

Vygotsky (1978) used genetic analysis, which examines the origins and the history of phenomena, focusing on their interconnectedness, to develop his theoretical framework and guide his research. In describing this approach he emphasized the

> need to concentrate not on the ***product*** of development but on the very ***process*** by which higher forms are established. ... To study something historically means to study it in the process of change; that is the dialectical method's basic demand. To encompass in research the process of a given thing's development in all its phases and changes—from birth to death—fundamentally means to discover its nature, its essence, for "it is only in movement that a body shows what it is." Thus, the historical (that is in the broadest sense of history) study of behavior is not an auxiliary aspect of theoretical study, but rather forms its very base. (pp. 64-65)

According to this perspective, learning and development take place in socially and culturally shaped contexts. Historical conditions are constantly changing, resulting in changed contexts and opportunities for learning. For that reason, there can be no universal schema that adequately represents the dynamic relation between external and internal aspects of development (John-Steiner & Souberman, 1978).

Vygotsky argued that psychological systems that unite separate functions into new combinations and complexes arise in the process of development. An example of this unification is the linking of spoken and written language into a new and broader semiotic system. When it was discovered that it was "possible to represent the sounds of language using marks in clay just as it is possible to represent objects" (Cole, 1990, p. 95), a qualitative transformation in the development of humanity occurred. The unification of separate functions represented in literacy also provides insights into the relations between individual and social processes.

In his studies of disabilities, Vygotsky analyzed the unification of separate physiological (anatomical, biochemical, and evolving neural) and psychological processes. His collaborator, neuropsychologist Luria (1973, 1979), examined cognitive functions in brain damage at different levels of analysis. This led to the concept of *functional* systems, which is particularly useful in the examination of phenomena at the interface of neural and cognitive processes, Functional systems are dynamic psychological systems in which diverse internal and external processes are coordinated and integrated. These systems reveal a variety of characteristics, including the use of variable means or mechanisms by individuals to perform particular tasks. In order to succeed when faced with new learning challenges, these individuals rearganize their cognitive strategies. Cole and Scribner (1974) used the concept of functional systems extensively in their cross-cultural research, as did Newman, Griffin, and Cole (1989), who found that

> external devices like talk and charts and writing are windows in the evolution and appearance of cognitive constructs. They are an essential part of the functional system that gives the actors as well as the analysts access to the changes occurring. (p. 73)

Functional system analysis captures the dynamic relation between changing and stable features of phenomena and the ways in which these are integrated in different contexts. In work with Native American children, John-Steiner and Osterreich (1975) found it particularly useful in examining the children's use of various learning styles and modalities to accomplish similar goals and tasks. A functional systems approach helped analyze Native American children's learning approaches, viewing them as part of adynamic system instead of splitting them into visual and verbal approaches.

Within genetic analysis, the use of functional systems provides a framework for representing the complex interrelationships between external devices, psychological tools, the individual, and the social world. Vygotsky used the sociocultural framework based on the three central tenets described previously—social sources of development, semiotic mediation, and genetic analysis—to develop his concept of internalization.

VYGOTSKY'S METHODOLOGICAL APPROACH

An understanding of Vygotsky's methodological approach helps to clarify the concept of internalization and to differentiate it from other theoretical perspectives. Vygotsky approached methodological issues on two interrelated levels: the theoretical and the psychological, On the theoretical level he examined complex systems in the process of change, using dialectical logic to understand the interrelationships between

components of the systems. On the psychological level he chose research methods to capture the dynamics of process consistent with his theoretical approach. On both levels his emphasis was on the examination of cognitive change in diverse contexts: "Any psychological process, whether the development of thought or voluntary behavior, is a process undergoing changes right before one's eyes" (Vygotsky, 1978, p. 61) To capture the processes at play, Vygotsky used the experimental–developmental method in which developmental changes are provoked in laboratory settings. Through intervention, the experimenter is able to record participants' initial efforts to solve a problem beyond their existing means or strategies. One of the intervention methods was providing auxiliary means through which the problem could be solved. This type of mediated assistance was of theoretical and methodological interest to Vygotsky. In studying memory in complex choice responses, he focused on the developmental changes taking place in the course of one or several sessions during which the learner appropriated new psychological tools.

Contemporary Vygotskian scholars researching cognitive change in classroom learning rely on both experimental and qualitative methods to focus on developmental processes. Sociocultural researchers reject "the cause-effect, stimulus–response, explanatory science in favor of a science that emphasizes the emergent nature of mind in activity and that acknowledges a central role for interpretation in its explanatory framework" (Cole, 1996).

Vygotskian researchers use this theoretical and methodological approach to study and describe the concept of internalization. This is germane to the discussion of classroom learning and teaching in this issue of *Educational Psychologist.* There is a vigorous discussion among sociocultural theorists and proponents of different theoretical perspectives about the way that concepts are learned and the processes through which they are acquired, appropriated, or internalized. These processes cannot be adequately understood, we believe, without comprehending the dialectical method Vygotsky used to examine them. The next section presents Vygotsky's use of the dialectical method, explains the authors' conception of internalization, and distinguishes sociocultural concepts of internalization frorn other perspectives.

Dialectical Method

Vygotsky did not simply try to impose laws or principles of dialectics on existing psychological theories, rather he scientifically investigated and analyzed concrete questions in specific areas of psychological inquiry. This approach was described by one of his collaborators, Leontiev (1977), who wrote that in science "dialectic logic does not amount to just the formalistic imposition of its principles on any particular scientific discipline. It itself develops as scientific inquiry proceeds; it is the result of empirical science" (p. 54). Vygotsky underscored the centrality of this method to all of his work:

> The search for method becomes one of the most important problems of the entire enterprise of understanding the uniquely human forms of psychological activity. In this case, the method is simultaneously prerequisite and product, the tool and the result of the study. (Vygotsky, 19713, p. 65)

In contrast to Aristotelian logic, which places phenomena such as mind and matter into fixed, unchanging categories, Vygotslcy (1978) analyzed higher mental functions as developmental processes in a constant state of dialectical change. He examined mind and matter in their interconnectedness and includled a "scientific explanation of both external manifestations and the process under study" (p. 63).

A central concept of dialectics, the unification of contradictions, distinguishes it from traditional approaches: "Whereas, within the standard view, conceptual unity among objects relies on the commonality of elements, it is the interrelatedness of diverse elements and the integralion of opposites that creates unity within dialectics" (Falmagne, 1995, p. 207). Dialectics surmounts clichotomies by looking at phenomena as syntheses of contradictions. In 20th-century physics, it was the unified vision of light as both wave and particle that led to a broader theoretical understanding. In nature, qualitative transformations unify contradictions—water, for example, as unification of hydrogen and oxygen, will go through transformations from gas to liquid to solid with quantitative changes in temperature. In addition, physical tools can unify contradictory functions—the claw hammer is used to both pound in and pull out nails; the pencil is used to create and erase (Weber, 1992).

Vygotsky (1986) used the dialectical notion of synthesis to analyze a central psychological tool—verbal thought. He examined the way that thought and speech, which initially have separate planes or levels of development in children in a "prelinguistic period in thought and a preintellectual period of speech" (p. 210), lbecome inextricably intertwined. Throughout his work Vygotsky used the dialectical methocl to analyze, explain, and describe interrelationships fundamental to human development where others posited dichotomies—for example, mind and matter, language and thought, external and inner speech, nature and culture, and social and individual processes in the construction of knowledge.

> Our concept of development implies a rejection of the frequently held view that cognitive development results from the gradual accumulation of separate changes. We believe that child development is a complex dialectical process characterized by periodicity, unevenness in the development of different functions, metamorphosis or qualitative transformation of one form into the other, intertwining of external and internal factors, and adaptive

> processes that overcome impediments that the child encounters. (Vygotsky, 1978, p. 73)

Using this approach, sociocultural theorists analyze internalization and individual and social processes as interrelated parts of neurophysiological, psychological, educational, political, and cultural systems (Tobach, 1995).

Internalization

Our concept of internalization recognizes unique human minds that owe their existence to and are inextricably intertwined with social, historical, cultural, and material processes (including brain activities). Internalization is conceived of as a representational activity, a process that occurs simultaneously in social practice and in the human brain/mind. Sociocultural researchers include the learners' appropriation of socially elaborated symbol systems as a critical aspect of learning-driven development. This appropriation of symbol systems was a central focus of Vygotsky's work, particularly as applied to educational pedagogy, and led to his most fully elaborated application of the concept of internalization—the transformation of communicative language into inner speech and further into verbal thinking (Vygotsky, 1986, chap. 7).

Although "cognitive constructivist research and practice ... is mostly oriented toward understanding the individual learner" (Derry, this issue, p. 164) and separates individual processes of knowledge construction from social processes of joint understanding, we think of them as connected and interdependent. The development of the mind of the child is both individual and social at the same time and is the result of a long process of developmental events (Vygotsky, 1978). A focus of sociocultural research is the study of the way that the coconstruction of knowledge is internalized, appropriated, transmitted, or transformed in formal and informal learning settings.

Vygotsky (1978) examined and explained the processes through which humans construct minds in interaction with the external world of nature and with other humans, changing in the process both themselves and nature:

> The dialectical approach, while admitting the influence of nature on man, asserts that: man, in turn, affects nature and creates through his changes in nature new natural conditions for his existence. This position is the keystone of our approach to the study and interpretation of man's higher psychological functions and serves as the basis for the new methods of experimentation and analysis we advocate. (pp. 60–61)

The Russian philosopher Ilyenkov added that "the socio-historical environment, the world of things, created by human labour, and the system of human relations, formed in the process of labour" must also be considered, and that "outside the individual lies not only nature as such ('in itself'), but also **humanized** nature, nature remade by human labour" (as cited in Bakhurst, 1995, p. 165).

In a psychological framework, the unification of nature and culture is powerfully embodied in early development. For example, a human embryo is both a material and a conceptual reality for the mother, but its own consciousness is dependent on the full (prenatal and postnatal) development of the infant's own nervous system and his or her subsequent internalization of culturally developed sign systems. Bakhurst (1995) wrote that "'the nature and content of an individual's mental life cannot be understood independently of the culture of which that individual is part" (p. 159). He further suggested that there are two intuitions that lie behind the claims of "strong cultural theories of the mind'":

> The first is that *meaning* is the medium of the mental, and meaning is (in some sense) socially constructed; the second is that the, human mind, and the forms of talk in which human beings explain and predict the operations of minds, should be understood on the model of ***tools,*** and like all artifact$, we cannot make sense of them independently of the: social processes which make them what they are. (p. 159)

Lemke (1995) posed the contradictory character of the relation between individual and social processes in the making of meaning: "how to have an active, creative human subject which constructs social meanings, at the same time that this subject itself must be a social construction" (p. 80). Vygotsky's use of dialectics to unravel this contradictory relation between individual and social processes in whibh the individual constructs the social and at the same time is constructed by the social distinguishes the sociocultural perspective from others presented in this issue. We favor the view of Penuel and Wertsch (1995):

> Sociocultural processes on the one hand and individual functioning on the other [exist] in a dynamic, irreducible tension rather than a static notion of social determination. A sociocultural approach ,... considers these poles of sociocultural processes and individual functioning as interacting moments in human action, rather than as static processes that exist in isolation from one another. (p. 84)

Distinctions From Other Perspectives

The way in which internalization has been interpreted by a variety of critics highlights the distinctions between sociocultural and other approaches. For example, social constructivist critics of the Vygotskian framework, such as Cobb and Yackel (this issue), characterize it as a transmission model through which students inherit the cultural meanings that constitute their intellectual bequest from prior generations. Their position was both linked to and differentiated from a Vygotskian stand when they questioned the metaphor "of students and teachers being embedded or included in

social practice" (Cobb, Wood, & Yackel, 1993, p. 96). Although their emergent approach has many commonalities with sociocultural theory, Cobb and Yackel repeatedly criticize the latter as a transfer-of-knowledge model in which students imitate "established mathematical practices" (this issue, p. 179). This interpretation of sociocultural theory reduces and simplifies the mutuality of learning and its interpersonal and intergenerational dynamic. In attempting to differentiate their approaches from sociocultural theory, social constructivists misinterpret the transformative character of internalization as described by sociocultural researchers (John-Steiner, 1996).

The conceptualization of internalization as unidirectional transmission freezes the debate, in part, by distorting sociocultural theorists' views of the roles of both teacher and student. It does not recognize that the sociocultural theory of internalization analyzes the complex process of transmission, transformation, and synthesis in the coconstruction of knowledge. As Leontiev wrote, "the process of internalization is not the ***transferal*** of an external activity to a preexisting internal 'plane of consciousness': it is the process in which this plane is formed" (as cited in Wertsch & Stone, 1985, p. 163). In classroom learning, the student plays an active role and constantly informs the teacher as their mutual negotiatiion and collaboration build knowledge.

> As well as the presentation of new information, there needs to be extended opportunity for discussion and problem-solving in the context of shared activities, in which meaning and action are collaboratively constructed and negotiated. In other words, education must be thought of in terms not of the transmission of knowledge but of transaction and transformation. (Chang-Wells & Wells, 1993, p. 59)

We explore other studies of classroom collaboration exhibiting transformative knowledge coconstruction later in this article.

There are different modes of internalization, reflecting different teaching–interaction strategies. A continuum with direct instruction on one end and creative, collaborative learning on the other could describe the wide range of teaching–learning situations in which internalization occurs. Whether in the learning of a young child or in the activities of experienced thinkers, internalization is a fundamental part of the lifelong process of the coconstruction of knowledge and the creation of the new.

Other critics warn that using the concept of internalization to explain the learning processes creates the danger of focusing on just the individual mental construction of knowledge. For example, Packer (1993), in his analysis, which was linked to a hermeneutic, interpretive approach, suggested that "Descartes' ghost may still be with us" (p. 263) because he saw elements of dualism in sociocultural concepts of internalization. Although he appreciated the work of Vygotskian scholars, Packer was concerned that "the processes and mechanisms being examined keep creeping back inside the head" (p. 263). In contrasting the view of learning as mental change with an alternative that focuses on participatory activities, his analysis is similar to that of Rogoff (1994): "Learning is a process of transforming participation in shared sociocultural endeavors" (p. 210).

In our view, internalization is simultaneously an individual and a social process. In working with, through, and beyond what they have appropriated in social participation and then internalized, individuals coconstruct new knowledge. In contrast to facile internalization, which leads to a limited combination of ideas, internalization that involves sustained social and individual endeavors becomes a constituent part of the interaction with what is known and leads to the creation of new knowledge. Chang-Wells and Wells (1993), in their study of the role of instructional conversations in classroom learning, described this interdependent and transformative view of internalization: "It is at points of negotiation of meaning in conversation that learning and development occur, as each learner's individual psychological processes mediate (and at the same time are mediated by) the constitutive intermental processes of the group" (p. 86).

Sociocultural approaches are also distinguished from other perspectives by the importance they place on cultural variation and its interrelationship with development (John-Steiner & Panofsky, 1992). This distinction is particularly relevant in contrasting sociocultural approaches with those derived from a Piagetian framework. The emphasis on culture resulted in the broad use by sociocultural researchers of approaches that examine the ways in which learning and teaching take place under different cultural circumstances and in different historical contexts, contributing to a *contextualized* rather than a universalistic theory of development. And although social constructivists do engage in an analysis of cultural norms, they maintain a conceptual dichotomy between the individual's constructive activity, on the one hand, and social processes, on the other. For example, Cobb and Yackel (this issue) view the individual through one lens and the social through another, without making explicit the dialectical interdependence of social and individual processes. To study these processes interdependently requires a reliance on cross-cultural comparisons and active collaboration between researchers drawn from varied backgrounds examining teachers and children in diverse settings.

The significant role of cross-cultural comparisons in theory construction and the development of educational practice is illustrated by the work of Tharp and Gallimore (1988) and their collaborators who developed a highly effective, culturally sensitive approach to teaching Hawaiian children. In their well-known Kamehameha Early Education Program, instructional conversations were designed to resemble the talk story format—overlapping speech, joint performance, and informal turn taking—favored in the native Hawaiian community. However, when this highly successful program was implemented among Navajo children, the results were mixed (Jor-

dan, Tharp, & Vogt, 1985). The researchers became aware of the difficulties in applying a promising, culturally sensitive approach from one indigenous context to another. They found that for Hawaiian children, four or five students in groups of mixed sex and ability produced the maximum peer interaction and learning cooperation. However, Navajo children were uncomfortable in the larger mixed groups and worked best in dyads of the same sex. These studies illustrated the importance to sociocultural approaches of inclusion of anthropologists, native teachers, and the learners themselves as educational activity planners whose joint efforts help educators understand the culturally patterned learning styles children bring to school. This emphasis upon interdisciplinary action research by Vygotskian educators contrasts with other approaches in educational psychology.

Sociocultural researchers emphasize methods that document cognitive and social change. Rather than seeing a dichotomy between quantitative and qualitative research, approaches are chosen that emphasize process, development, and the multiple ways in which both can be revealed. They include experimental research such as Frauenglass and Diaz's (1985) work on private speech, which studied Vygotsky's hypotheses on the universality and self-regulatory significance of private speech. In a laboratory setting, they

> compared the frequencies of preschoolers' private speech in perceptual versus semantic tasks, with or without instructions that permitted and encouraged the use of overt verbalizations. ... [And found] that researchers who choose to study private speech in laboratory settings must pay close attention to task and setting variables that may increase or inhibit the amount of private speech produced by children in their samples. (Diaz, 1992, p. 57)

Other sociocultural approaches combine experimental and ethnographic research as illustrated by Scribner and Cole's (1981) work in Liberia. In their studies of literacy, they included observational and ethnographic methods and combined them with tasks first developed in laboratory settings. Examples of sociocultural methods of research on cognitive change in the classroom are described in the next section.

SOCIOCULTURAL EDUCATIONAL RESEARCH AND PRACTICE

This section briefly examines Vygotsky's analysis of the relation between learning and development, his concept of the zone of proximal development, and implications drawn from them for research on collaborative learning. Vygotsky's analysis of spontaneous and scientific concepts is then examined, focusing on the central roles in concept formation played by language and culture. The integrated influences of culture and language are then examined in practical applications of sociocultural approaches to classroom learning and teaching in literacy instruction. An additional and related theme highlighted in this section is the way sociocultural theory helps educators provide instruction that recognizes and empowers linguistically and culturally diverse students.

Learning and Development and the Zone of Proximal Development

In contrast to prevailing theories of his time that dichotomized learning and development, viewing one as an external and the other as an internal process, Vygotsky (1978) looked at their unity and interdependence starting from a child's birth:

> Our hypothesis establishes the unity but not the identity of learning processes and internal developmental processes. It presupposes that the one is converted into the other. Therefore, it becomes an important concern of psychological research to show how external knowledge! and abilities in children become internalized. (pp. 90–91)

Vygotsky thus criticized theories such as Piaget's, in which "maturation is viewed as a precondition of learning but never the result of it" (1978, p. 80), and developed the following position:

> Learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers. ... Learning is not development; however, properly organized learning results in mental development and sets in motion a variety of developmental processes that would be impossible apart from learning. Thus learning is a necessary and universal aspect of the process of developing culturally organized, specifically human, psychological functions. (p. 90)

To help explain the way that this social and participatory learning took place, Vygotsky (1978) developed the concept of the zone of proximal development, which he defined as "the distance between the actual developmental level as determined through independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). Sociocultural theorists, expanding the concept of the zone of proximal development, increasingly conceptualize learning ***as distributed*** (Cole & Engeström, 1993), ***interactive*** (Chang-Wells & Wells, 1993), *contextual* (John-Steiner, Panofsky, & Smith, 1994), and the result of the ***learners' participation in a community of practice*** (Rogoff, 1994).

Brown and her collaborators (1992, 1993) developed and implemented educational programs based on this concept of learning. They suggested that the active agents within the zone of proximal development "can include people, adults and children, with various degrees of expertise, but it can also include artifacts, such as books, videos, wall displays, scien-

tific equipment and a computer environment intended to support intentional learning" (1993, p. 191). In expanding the zone of proximal development to include artifacts in addition to people, Brown integrated Vygotsky's analyses of tools and symbols with the roles played by the participants in the learning process. One of the important features of Brown and her collaborators' work is the examination of the way "divergent classrooms can become learning communities—communities in which each participant makes significant contributions to the emergent understandings of all members, despite having unequal knowledge concerning tht: topic under study" (Palincsar, Brown, & Campione, 1993, p. 43). They examined the role of "reciprocal teaching," an approach in which "students and teachers take turns leading discussions about shared text" (p. 43), to see whether structured dialogues foster a learning community. The teachers in these studies had a changing role. They shared with the students the well-defined tasks of questioning, clarifying, summarizing, and predicting in order to construct texit-based knowledge. These studies exemplify two themes in sociocultural approaches to classroom learning and teaching: (a) the implementation of an educational program that allowed for or encouraged the coconstruction of knowledge and (b) the analysis of this learning that contributed to our understanding of classroom learning from a sociocultural perspective. Collaborative learning plays an increasing role in these as well as many other innovative classrooms.

Collaboration Research

In current applications of sociocultural theory with emphases on coparticipation, cooperative learning, and joint discovery, teachers bring existing knowledge to students by coconstructing it with them. These applications make clear the need to examine patterns of interaction and collaboration in this type of classroom. A major goal of our research is to produce a theoretical model of the collaboration process and to identify collaborator's values, roles, working methods, and conflict-resolution strategies.[3] Through the analysis of selected project documents and transcribed discourse from group meetings, as well as through focused interviews, our initial work revealed four patterns-distributed, complementary, family, and integrative—among individuals, small groups, and larger complex collaborations (see Figure 1). We use a circle and dotted lines to show that collaborative efforts are dynamic, changing processes. Although the corresponding characteristics of values, working methods, and roles For each pattern are depicted in the bands around the wheel, there is no rigidity in the divisions. The order of the patterns is not hierarchical, and a collaboration can be initiated at any level and be transformed over time. A goal is to examine how the resolutions of tensions inherent in collaborations transform the character of the collaboration and determine whether it continues.

In the move from the outer edge of the wheel in Figure 1 to the center, collaborations tend to be longer term and are characterized by the increasing importance of negotiated and common values. In distributed collaborations, such as collective e-mail discussions in which the exchange of information is featured, values need not extend beyond similar interests; whereas in integrated collaborations—long-term, often dyadic, imd intimate—values are reflected in the development of shared ideologies. Complementary collaborations, such as those found in the organization of teams in classrooms and in the business world, are distinguished by clear divisions of labor and discipline-based approaches. In contrast, family collaborations, often centered an providing social services, including education, are characterized by the fluidity of roles and the integration of expertise.

The conceptualization of the patterns of collaboration in Figure 1 is of use in the study of classrooms engaged in collaborative learning. Complex social relationships and different cultural values shape the intellectual interdependence in the coconstruction of knowledge in classes that are not based on the traditional teacher-centered transmission model of education.

The way that cultural and linguistic factors shape learning and development and the impact that these factors have on pedagogical approaches provide a theoretical foundation for sociocultural research of collaboration in the classroom. There is a growing literature on cooperative learning and peer collaboration, of interest to both Piagetian and Vygotskian researchers (Damon & Phelps, 1989; Slavin, 1983, 1987; Tudge & Wogoff, 1989), which can inform classroom practice.

In differentiating their approach from others, Forman and McPhail (1993) highlighted three features of a sociocultural perspective on the study of collaboration in education. First, rather than locating the source of individual motivation and understanding within or between individuals, they located it in sociocultural practices in which children have the opportunity "to observe and participate in essential economic, religious, legal, political, instructional, or recreational activities." Through guided participation "children internalize or appropriate their affective, social, and intellectual significance" (p. 218). Second, Forman and McPhail wrote,

> For Vygotsky, cognitive, social, and motivational factors were interrelated in development. Thus it makes no sense to evaluate the benefits of peer collaboration in purely intellectual terms, e.g., via individual achievement testing. A Vygotskian perspective also implies that the outcomes of peer

[3]Supported by National Science Foundation Grant #SBR–9423277, we, together with Michele Minnis, Robert J. Weber, and Teresa Meehan, are examining values, roles, responsibilities, working methods, and conflict-resolution strategies to develop patterns of collaboration in long-term interdisciplinary and interinstitutional projects organized to solve complex social and technical problems. The two main collaborative groups we are analyzing consist of adults involved in a water consortium and adults and adolescents participating in a program the focus of which is on middle school students whose home, school, and community environments make them susceptible to drug and alcohol abuse.

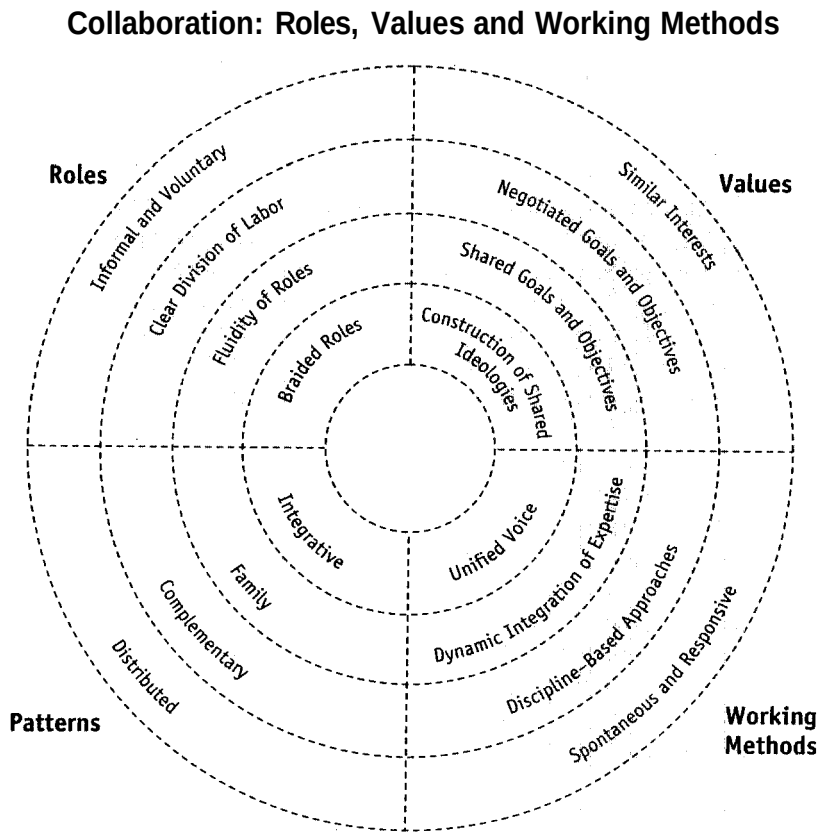

FIGURE 1 Phases of the developmental research cycle.

> collaboration must be evaluated in context and over time. (p. 218)

The third feature of Forman and McPhail's (1993) approach was that discourse analysis can be used to examine participants'

> epistemological and affective dispositions toward collaborative problem solving. Their discourse should reflect their individual and shared understandings and feelings about the task setting, as well as the definitions of the activity that are provided by their particular cultural and historical situation. (pp. 218–219).

Using this framework, Forman and McPhail (1993) examined the ways in which learners assist each other. Their work, which focused on dyads engaged in problem-solving activities, illustrated the ***complementary*** pattern of collaboration. The two students in the study, after initial differences on task definition, developed a division of labor based on areas of expertise reflected in specialized forms of discourse—scientific and mathematical. This study highlighted the need to develop joint perspectives over time to achieve shared goals. Forman and McPhail emphasized the role of mutuality and the use of specialized forms of discourse "to engage in logical arguments, to share ideas, and to work together in the pursuit of common goals" (p. 226). (This finding corresponds to our own; we found the importance of trust in the development of working methods in sustained collaboration.)

A different pattern of collaboration was revealed in Moll and Whitmore's (1993) study of a bilingual classroom in the southwestern United States in which reading and writing in two languages were integrated in project-oriented literacy activities. This study, using a sociocultural approach, examined the interactive and contextual character of cognitive change as students created and participated in communities of learners. The collaboration described by Moll and Whitmore (1993) exemplified the family pattern, with a fluidity of roles and a reliance on various areas of expertise from the students and the teacher in the joint construction of knowledge. Because the teachers and children were actively and mutually creating learning situations, the roles of both were flexible. The children often took the lead in shaping text-related discussions. The teacher's roles included those of ***guide*** and ***supporter*** whose "guidance [was] purposely mediated, almost hidden, embedded in the activities"; ***participant*** in thematic research activities; ***evaluator*** of the students' development; and ***facilitator*** and ***planner*** who organized "the environment, curriculum, and materials to provide functional and purposeful uses for language, literacy, and learning processes" (p. 38). At the same time the "children [had] consid-

erable control of virtually all aspects of their own learning experiences. They select[ed] groups, reading materials, writing topics, theme topics, and language to use for each" (p. 38). Moll and Whitmore (1993) described a pattern of collaboration in which the development of trust among the participants was of central concern. These patterns of shared responsibilities in teaching and learning contribute to a broadened understanding of the zone of proximal development and help illustrate the emerging patterns of collaboration shown in Figure 1.

Another example of the family pattern of collaboration is the afterschool program known as the Fifth Dimension, developed by Michael Cole, Peg Griffin, and their collaborators at the University of California, San Diego, which brings together children and adolescents, community institutions, undergraduate students, and researchers. It relies upon computer technology, collaborative learning, play, and imagination "within the framework of a shared and voluntarily accepted system of impersonal rules" (Nicolopoulou & Cole, 1993, p. 293). Cole (1995) and his colleagues extended Vygotskian analyses of learning beyond the dyadic and small-group level to include an examination of different sites as institutional and cultural contexts for these activities. The success of the Fifth Dimension is based, in part, on the character of the collaboration, which includes a fluidity of roles across ages and areas of expertise. The integration of play and learning helps meet the shared goals and objectives of the program. This innovative, collaborative program contrasts with traditional models of education, which isolate teachers in their classrooms.

Sociocultural research on collaboration also includes examination of the mutual dependence of teachers engaged in collective activity and dialogue in the process sf curriculum innovation. Engestrom (1994), in his study of teachers, found an additional benefit of collaboration research:

> One of the most persistent methodological difficulties of studying thinking has to do with access to online data from thought processes. When thinking is defined as a private, individual phenomenon only indirect data is accessible. Thinking embedded in collaborative practical activity must to a significant degree take the form of talk, gesture, use of artifacts, or some other publicly accessible mediational instrumentality; otherwise mutual formation of ideas would be rendered impossible. Collaborative thinking opens up access to direct data on thought processes. (p. 45)

Teachers in traditional schools often do not have the opportunity to interact with colleagues, as did the teachers in the Engestrom study, and thus have "limited opportunities for receiving assistance through modeling and feedback, two means of assistance crucial to acquisition of complex social repertoires ... necessary to meet the criterion of teaching-as-assisted-performance in the zone of proximal development" (Gallimore & Tharp, 1990, p. 201).

A particularly powerful example of collaboration, and one that can inform our efforts at eclucational reform, was provided by Brazilian teachers who worked together with community activists to educate previously excluded populations (Souza Lima, 1995). Their local initiatives, broadened and strengthened through the use of the sociocultural theories of Yygotsky, Wallon, and Freire, were applied to citywide and broader reform efforts. Studies of teachers in dynamic interactions with other teachers, students, researchers, and reformers are important in the ongoing sociocultural research into collaboration and educationall change.

Spontaneous and Scientific Concepts

In classrooms in which there is coparticipation, cooperative learning, and joint discovery, environments are created in which students are able to build upon the culturally shaped knowledge and value systems they bring to school. Vygotsky's analysis of spontaneous ,and scientific concepts provides a foundation for examining how children learn before they enter school and how this knowledge relates to concepts learned at school.

> By spontaneous concepts Vygotsky meant concepts that are acquired by the child outside of the context of explicit instruction. In themselves these concepts are mostly taken from adults, but they never have been introduced to the child in a systematic fashion and no attempts have been made to connect them with other related concepts. Because Vygotsky explicitly acknowledged the role of adults in the formation of these so-called spontaneous concepts he preferred to call them "everyday" concepts, thus avoiding the idea that they had been spontaneously invented by the child. ... By "scientific" concepts Vygotsky meant concepts that had been explicitly introduced by a teacher at school. Ideally such concepts would cover the essential aspects of an area of knowledge and would be presented as a system of interrelated ideas. (van der Veer & Vlasiner, 1991, p. 270)

Although Vygotsky (1986) discussed spontaneous and scientific concepts by highlighting their distinguishing characteristics, he recognized their interdependence. He wrote,

> We believe that the two processes—the development of spontaneous and of nonspontaneous concepts—are related and constantly influence each other. They are parts of a single process: the development of concept formation which is affected by varying external and internal conditions but is essentially a unitary process, not a conflict of antagonistic, mutually exclusive forms of thinking. (p. 157)

The social situatedness of concept formation was studied by Moll (1992), who used Vygotsky's analysis to gain insight into providing effective education for linguistically and culturally diverse students:

> One advantage [of a sociocultural approach] is that in studying human beings dynamically, within their social circumstances, in their full complexity, we gain a much more complete and ... a much more valid understanding of them. We also gain, particularly in the case of minority children, a more positive view of their capabilities and how our pedagogy often constrains, and just as often distorts, what they do and what they are capable of doing. (p. 239)

Analyzing how students learn, as well as acknowledging and attempting to understand the culturally conditioned knowledge they bring to the classroom, can help lead to effective teaching. In an ethnographic study looking at how the knowledge that existed in Mexican American students' households could be used to bring about innovative instructional practice, Moll and Greenberg (1990) found a variety of "funds of knowledge" including knowledge "about different soils, the cultivation of plants, and water management ... animal husbandry, veterinary medicine, ranch economy, and mechanics as well as carpentry, masonry, electrical wiring" (p. 323). They also found that this knowledge was socially distributed and that a reciprocal relation existed between everyday knowledge used to understand school material and classroom activities used to help students understand social reality. To facilitate this interaction, an afterschool lab was created "within which researchers, teachers, and students [met] to experiment with the teaching of literacy. We [thought] of this lab setting, following Vygotsky, as a 'mediating' structure that facilitate[d] strategic connections, multiple paths, between classrooms and household" (p. 320). Without such mediating structures, investigations into discourse practices in school and home found that the variations between the two can lead to problems as students adjust to the requirements of formal education.

In order to understand children in school settings, sociocultural approaches examine the development of language and the ways in which culturally different modes of discourse, both within and between cultures, shape children's development and impact their educational experiences.

> From birth, the social forms of child-caretaker interactions, the tools used by humans in society to manipulate the environment, the culturally institutionalized patterns of social relations, and language, operating together as a socio-semiotic system, are used by the child in cooperation with adults to organize behavior, perception, memory, and complex mental processes. For children, the development of language is a development of social existence into individuated persons and into culture. (John-Steiner & Tatter, 1983, p. 83)

The linguist Gee (1989) argued that "discourses are intimately related to the distribution of social power and hierarchical structure in society" (p. 20). The impact of different, culturally patterned modes of discourse is felt from the primary grades through higher education. Minnis (1994) examined the ways in which linguistically and culturally diverse students were at a disadvantage in law school when faced with the norms of a legal community indifferent to their culture, discourse, and values. She quoted a Chicana law student:

> The game is alien to your upbringing. It is a manipulation of words in a foreign tongue—words which mystify, manipulation which obscures your search for justice. You will feel as if you don't belong. ... Group learning was almost impossible. Most of my classmates were heartlessly competitive.... If I were to call someone ambitious in English, it would be a compliment. If I were to say the same in Spanish, it would be an Insult. (pp. 382–383)

Studies of schooled discourses are of particular interest to contemporary students of education and development. Some of these discourses are empowering, as in the bilingual classroom studied by Moll and Whitmore (1993); others contribute to the oppression of the silenced (Belenky, Clinchy, Goldberger, & Tarule, 1986; Cazden, 1988, 1993: Freire, 1970). Gee (1991), drawing on research by Scribner and Cole (1981), Heath (1983), and others, identified sociocultural explanations of school failure: (a) discontinuities between the culture (values, attitudes, and beliefs) of the home and school; (b) mismatches in communicative practices between nonmainstream children and mainstream teachers, which lead to miscommunication and misjudgments; and (c) the internalization of negative stereotypes by minority groups who have been marginalized and often see school as a site for opposition and resistance. Children whose mode of discourse is different from that used in school instruction find themselves at a disadvantage and often drop out, or are farced out, of school.

The ways in which children acquire language and construct knowledge in nonschool environments and the dynamic relation with what they are taught in school is maximally relevant to school learning. The conceptual and theoretical tool of spontaneous and scientific concepts provides particularly interesting applications and expansions in literacy acquisition.

Literacy Acquisitian

Since the time when Vygotsky and the young Russian psychologists of the 1920s faced the social task of educating an overwhelmingly illiterate population following the tremendous upheavals that transformed the Soviet Union during the Russian Revolution of 1917, literacy acquisition has been a central concern of sociocultural theory. For example, Scribner and Cole (1981) built on Vygotsky's examination of the role of literacy in the transformation of children's learning when they enter school and analyzed the relation between literacy and cognitive development. They found that literacy can be acquired independently of schooling (particularly, schooling in the vast Western systems of education) and that literacy practices used in different contexts have specific effects on cognitive competencies. Their findings contrasted with more universal accounts of the relation between literacy and formal modes of thought (Olson, 1977).

Chang-Wells and Wells (1993) used Vygotsky's work on both learning and development, and spontaneous and scientific concepts to examine three dimensions of change in mental functioning that can be ascribed to formal learning: intellectualization of mental functions, bringing them under conscious and voluntary control; decontextualization, being able to detach a concept from the context in which it was first encountered; and a movement toward integration and systematization. They asserted that all these dimensions of cognitive change

> are dependent on literacy, when it is understood not simply as the encoding and decoding of written language or the use of written texts for functional purposes but as engaging with texts of all kinds in ways that exploit the symbolic representation of meaning as a means of empowering intrapersonal mental activity. (p. 61)

Using this theoretical foundation, they analyzed the use of effective instructional discourse in two classrooms designed to present literacy instruction in the students' zones of proximal development.

To create an effective learning environment for literacy acquisition, Yygotsky (1978) wrote,

> Teaching should be organized in such a way that reading and writing are necessary for something. ... That writing should be meaningful ... That writing be *taught* naturally ... and that the natural methods of teaching reading and writing involve appropriate operations on the child's environment. (pp. 117–118)

These considerations influenced recent sociocultural approaches to literacy instruction for children and adults in school, at workplaces, and in after-school, home, and day care settings (Clay & Cazden, 1990; John-Steiner, Panofsky, & Smith, 1994; McNamee, 1990; Scribner & Cole, 1981; Zebroski, 1994).

Using a genetic approach to literacy acquisition, sociocultural theory examines the origins of both reading and writing. Panofsky (1994) studied the role of parent–child book reading in early literacy socialization, focusing on the functions and uses of language. She differentiated between representational and interactional functions of language, building upon Vygotsky's distinctions. Illustrating the roles of scaffolding and the zone of proximal development, she noted "a shift in the use of functions from a predominance of parent initiations to a predominance of child initiations" (p. 239).

Vygotsky (1978) considered early literacy experiences important in the acquisition process. He saw the origin of writing in a child's gesture, which "is the initial visual sign that contains the child's future writing as an acorn contains a future oak. Gestures, it has been correctly said, are writing in air, and written signs frequently are simply gestures that have been fixed" (p. 107). In the child's development, there: are two other domains in which gestures are linked to the origins of written language. The first is in scribbling and the dramatizations that often accompany it; the second is in the area of ,symbolicplay, in which a child assigns meaning to an object through gesture. The varied sources of writing in children's early years intrigued Vygotsky, who wrote of drawing and play as preparation to literacy. In a related vein, McLane (1990) found in a study of writing by children in an after-school day care program that "children will, with adult involvement and support, use writing as a resource for extending their interests in drawing, in pretend and exploratory play, and as a means of exploring and conducting social relationships" (p. 317).

As a result of being r e d to and using a writing tool to inscribe: a piece of paper, or often a wall, the child develops spontaneous concepts in the process of telling stories, acting out roles in imaginative play, or creating representations. When children begin formal schooling, they start with a foundation that is shaped by the nature of the interaction between caretaker and child, by literacy uses valued by a particular culture, by print in the environment, and by the child's own activity in literacy events. The challenge is to value and builcl on what the clhild brings to the classroom. "By broadening both teachers' and students' views of students' backgrounds and existing knowledge, the unique experiences that students bring to school make an important contribution to the: process of literacy acquisition" (Hiebert, 1991, p. 3). In a study of Latino households in California, Gallimore and Goldenberg (1993) identified meaningful settings, which provide literacy activities, such as letter writing, for novice learners of reading and writing. They focused on cultural experiences in everyday life and on the active participation of young learners in literacy events. If such a focus is not adopted, teachers will not be able to understand their students' attempts at literate ways of thinking (Langer, 1991), nor will they be able to provide the learrdng opportunities to facilitate literacy acquisition for all students.

> Such differences in language use in ethnically mixed classes often result in differential access to literacy experiences. ... Teachers often unknowingly exclude or reduce the time minority students participate in literacy activities because features of their discourse do not conform to teachers' expectations ok match their speaking style. (McCullom, 1991, pp. 111–112)

Unclerstanding differences such as these are also important in teaching English to speakers of other languages. Sociocultural theory recognizes the need for cultural, cognitive, and attitudinal bridges between English as a Second Language (ESL) students and their new environment. The use of dialogue journals with elementary and secondary students, as well as with adults, has been found to be an effective technique to coconstruct knowledge by allowing ESL students to draw on their own experiences and develop their own voices in meaningful, interactive, written communication (Mahn, 1992; Staton, Shuy, Peyton, & Reed, 1988).

In recent years there has been a critical reevaluation of the traditional methods of literacy instruction based on a single, universal timetable and on cross-cultural universality. Vygotsky's advice about teaching literacy as a natural process is realized in whole language (Goodman, 1975; Goodman & Goodman, 1979) and process approaches to reading and writing (Calkins, 1986; Emig, 1971; Graves, 1983; Murray, 1985). These approaches view the interdependence of social and individual processes as a natural part of each student's development (Scinto, 1986). Reading and writing are not structured as solitary acts, rather they develop in collabarative efforts in a community of learners (Zebroski, 1994). The core elements of these innovative approaches to literacy instruction draw from and are supported by sociocultural theory and research.

The proponents and practitioners of such techniques and approaches, however, may not have ever heard of Vygotsky or of sociocultural approaches. Increasingly, however, teachers exposed to these ideas offer the 'sentiment that sociocultural theoretical perspectives provide the language for what they are doing in their classrooms. This shows both the limitations of and the promise for sociocultural approaches. Because this theory is complex and breaks radically from the traditional American educational model in which teachers were schooled, it is hard to appropriate. The tendency is to abstract parts of the theory from the whole, which results in distorted understandings and applications. As more educators become aware of the broad scope of sociocultural theory, they will develop practical applications that will broaden and strengthen this theoretical framework. Such a perspective offers exciting opportunities for researchers and teachers as we face the challenges of educating youth for the 21st century.

CONCLUSION

A goal for sociocultural theorists is the sustained development of methodological approaches to educational and psychological research that focus on process and provide ways of documenting change and transformation. In this article we presented a sociocultural approach to learning and development and implications for classroom learning and teaching. An emerging theme in both theory and practice is the collaborative and transformative way in which knowledge is coconstructed. We focused on three central tenets from Vygotsky's complex legacy—social sources of individual development, semiotic mediation, and genetic analysis—and presented an argument for viewing learning as distributed, interactive, contextual, and the result of the learners' participation in a community of practice.

Our aim was to weave together some of Vygotsky's key ideas with pressing, contemporary concerns, particularly the need to shape educational institutions to deliver instruction that meets the needs of all students, especially the linguistically and culturally diverse who historically have been marginalized by traditional models of pedagogy. We believe a sociocultural point of view provides a deeper understanding of both the possibilities for and the problematic nature of educational reform. Because educational institutions are a part of and reflect the larger social system in which they are situated, a proposal for substantial reform would have to consider economic, political, historical, social, and cultural factors. Although such an analysis was not the intent of this article, we believe a concept we presented—the socially structured interdependence of teaching and research, theory construction, and educational intervention—provides a starting point for local reform initiatives, such as those in Brazil described previously.

In the sociocultural framework, notions of community and participation were applied primarily to novice learners. The applications of these notions to adults to study the dynamics of collaboration and the interdependence of individual and social processes are areas for further practical and theoretical development. Social constructivist frameworks, although not necessarily contradlatory to sociocultural ones, focus more on the possibilities for change within the individual child; whereas sociocultural theoretical perspectives, as they develop and are applied to educational systems, look at change at different levels of analysis and organization. Central to the task of educators and psychologists is conceiving of our work as a system rather than as a set of isolated activities. The sociocultural perspective can only thrive with the continued, and at times discordant, articulation of the many voices of this thought community.

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