CHAPTER 6

SOCIOCULTURAL APPROACHES TO EDUCATIONAL PSYCHOLOGY: THEORY, RESEARCH, AND APPLICATION

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Sociocultural approaches share the conviction that children's learning and development take place in historically situated activities that are mediated by the children's culture through intersubjective experiences in which they participate with other members of their communities. These approaches emphasize that each culture presents its children with activities that are deemed valuable for their education and appropriate for their participation. Often, these opportunities are tailored to the developmental and individual capabilities of children in tacit or explicit ways. Depending on the priorities of their culture, children's participation occurs in formal and informal school, home, and community activities with their teachers, peers, and family and community members (Cole, 1996; John-Steiner, 1985; Kajitani, 2007; Bogell, 2003; Vygotsky, 2000; Wertsch, 1985).

Children's engagement is mediated through artifacts such as language and technology, and guidance that can range from playing to observational opportunities and explicit instruction. By participating in cultural activity mediated in such, children negotiate the meanings of their culture, accepting, rejecting, or transforming them. Thus, sociocultural views do not see development as predetermined. The social world provides the developing mind with a dynamic and mutually generated context that originales in and is maintained by the contributions and goals of the participants.

Sociocultural views recognize individual variation. Unique characteristics of the individual, ranging from multiple cultural affiliations to tendencies and constraints of the biological system such as temperament and certain learning disabilities, coordinate with the social and cultural context in ways that yield a unique process of cognitive development matched to the conditions in which a child lives. For instance, as Sperer and Harkness (1982) showed, the interpretation of difficult infant syndrome is not independent of the cultural context. Whereas babies with irregular habits, problems adjusting to new circumstances, and negative mood are viewed as temperamentally difficult in the metropolitan United States, difficult babies in rural Kenya are those who have trouble adapting to sibling caregivers and traditional methods of soothing, such as being carried on an adult’s back. These different pathways have myriad developmental implications, including the process of children's learning, especially in social settings. This is because, as described in the sociocultural approach, the individual emerges through transactions with others in the cultural context of development (Balzur, 2007).

This chapter is devoted to the elaboration of these ideas. We begin our presentation with a brief history of the emergence of sociocultural approaches in response to mainstream research practice in psychology. Next, we illustrate the evolution of sociocultural approaches and describe their shared vision...
along with their differences where relevant. We
began by discussing cultural approaches followed by
discussion of Vygotsky’s contribution and activity
theory. In the ensuing sections, we move on to the
substantive contributions of sociocultural
approaches in the study of teaching and learning
with particular attention to cognitive processes such as
attention, memory, and problem solving, which
are important for learning both in and outside of
school. We discuss how children’s cognitive func-
tioning is examined in relation to different social
cultural contexts, identities, and activities.

We end with illustrations of the influences of soci-
cultural approaches in school practices regarding
curriculum, and teacher–child and peer collabora-
tion. Because of space limitations, we confine our
presentation to the discussion of sociocultural
approaches in the United States, although we draw
from work conducted elsewhere where relevant.

SETTING THE STAGE: THE EMERGENCE OF
SOCIOCULTURAL APPROACHES

Late in the 20th century, the field of educational
psychology showed increasing incorporation of
sociocultural views (for possible sociopolitical
causes, see Matsus, 2008). An examination of sev-
eral textbooks reveals that sociocultural approaches
are included in the introductory chapters on guiding
theories of the field, and the research findings in
sociocultural approaches are integrated into the fab-
ne of narratives throughout the texts (e.g., Clusen,
2008). This change reflected shifting in educational
psychology’s primary focus on a search for univer-
sals based on the study of isolated learners in experi-
mental laboratories to consideration of the role of
community and social relationships in children’s
learning and development in natural contexts
(Gottsch, 1999). We discuss these shifts below.

In the past, the mainstream perspective in devel-
opmental and educational psychology considered
culture only when the search for universals was
inadequate for explaining individual or group varia-
tion (cf. Cole, 1996; Laboratory of Comparative
Human Cognition, 1983; LeVine, 1970; Rogoff,
2003; Snowder, 1990). This use of culture as cover,
that is, to cover up a lack of understanding of
human variation, merely made explicit reference to
culture as playing a role in children’s learning and
development. Because cultural features occurred
only when findings did not support researchers’
expectations with regard to certain variables, such as
age and sex, that are assumed to follow a universal
developmental course. Childhood was characterized
as a decontextualized manner without integrative
discussion of the affective, social, and cultural con-
texts in which children’s learning and development
take place.

As we discuss in this chapter, contemporary
research supports the claim that children’s learning
is guided by the goals and activities of culture, and
such goals and activities may vary substantially from
one culture to another. As such, children’s learning
and development contain both similarities and dis-
similarities across different cultures. Consideration
of cultural goals and activities as frames for chil-
dren’s learning and development enables us to rec-
ognize that variables such as age and sex that are
regarded as universally constant characteristics of
childhood are cultural constructions as expressed in
developmental capacity and gender. Thus, address-
ing questions of educational psychology from a
(sociocultural perspective presents a fuller and
more accurate picture of children’s learning and
development. At the same time, it provides insights
relevant to designing and examining educational
settings for children, especially in multicultural
texts that are increasingly common in the world.

Beginning with this view, the Journal of Educa-
tional Psychology called for detailed description of study par-
ticipants and the interpretation of research findings
in relation to them (e.g., Harris, 2003).

In addition to assumptions regarding the univer-
sality of child development and learning, previous
research focused on the individual solitary child as
the level of analysis. Admittedly, such work yielded
a substantial body of knowledge about individual
and age-related differences in cognitive perfor-
mance, at least under particular conditions. How-
ever, such research also failed to provide substantive
generalization on transfer of learning across con-
texts. Moreover, when diverse samples were
included in research, findings often revealed pro-
found differences in cognitive performance across
groups that varied in social or cultural background.
Without a theory to connect cognitive functioning
to the social and cultural context, these differences
led to depict hypotheses about those who differed
from the standards of optimal development and
learning adopted by the researchers (for a review,
see Rogoff, 2003).

An ancillary shortcoming of much of the
research focused in the individual was that there
was little inquiry into the experiences or processes
that promote and support cognitive development and
learning. This is surprising because few researchers
who study individual performance endorse a maturationist explanation of cognitive
development, assuming that some exogenous forces are involved. However, prior to more widespread
recognition of sociocultural approaches, examina-
tion of external forces tended to concentrate on
physical and material conditions of a cognitive per-
f ormance rather than on social or cultural contribu-
tions. For example, Piaget and his followers who studied concept development have attended to cer-
tain experiential features of performance, such as
variations in the onset of conservation across differ-
tent forms of matter, without paying attention to
social and cultural contributions to this develop-
ment, even though research has established that
cultural contributions are important in this
development (e.g., see Price-Williams, Gordon,
& Ramona, 1969). In like fashion, much of the re-
search focused on information processing and cog-
nitive science approaches has been attentive to
external influences that are part of the immediate
problems students, evident in careful task analysis,
and yet social and cultural contributions are not taken
into account. In short, many of the long-established
approaches to the study of cognitive development
and learning focus on the individual child, and, in
doing so, have tended to ignore the real-life settings
people with other people and human-made
resources and symbols, including communication,
that support the development and use of these skills.
Although the individual level of analysis has been
the mainstay in research on cognitive development
and learning, the scientific basis of this approach is
only open to inquiry. A focus on the individual is consis-
tent with traditional cultural beliefs of many Western
societies, especially the United States. As Kessen
(1979) wrote, “The child—like the Pilgrim, the cow-
boy, and the detective on television—is invariably
seen as a free-standing social being who moves
through development as a self-contained and com-
plete individual” (p. 189). Kessen suggested that
developmental sciences might have adopted an
approach that reflected deeply held cultural views.
He also predicted that this position, or dogma of
individualism, as he called it, would resist alter-
tive, more socially based views of cognitive develop-
ment and learning.

Consistent with Kessen’s (1979) observations,
when the mainstream research has taken children’s
relationships into account, it has often focused on
dyadic relationships that are the most common form
of relationship by which children’s learning activi-
ties are organized in the Western world. For exam-
ple, research on the development of selective
attention examines whether children follow instruc-
tions specified by an adult in a dyadic encounter.
However, as we discuss in the third section of this
chapter, this social arrangement is not the norm in
many parts of the world; children’s activities usually
take place in groups, and their attention is moni-
tored by a number of people and multiple events
simultaneously (Cole, Medzhukuevo, & Fonoom-
ay, 2011; Guazzini, 2003). Thus, studies inspired by
sociocultural theory take myriad forms, some con-
centrate on dyads, others on triads or larger groups.
Some studies focus on people in relationships (e.g.,
families, tribes, classrooms), and others involve
strangers (e.g., randomly assigned peers, instructors,
and learners). Yet, all of these studies are united in
their focus on cognitive functioning in a social con-
text. Sociocultural approaches examine children’s
learning and development as part of their existing
social networks that support and guide their learning
in order to reflect this process accurately.

Sociocultural approaches also expose that chil-
dren’s relationships and social and cultural activities
are an essential part of the analysis even when the
focus is on the sole child. Examples of this perspec-
tive are seen in young children’s solitary imaginative
play. When a child pretends to be a mother in her
play, she is producing something that she has experi-
enced as meaningful cultural life about motherhood
in her relationships with other people (cf. Gouzou & Gaskins, 2011).

Finally, sociocultural approaches question the validity of experimental research in which efforts are taken to minimize external influences on performance in presumably confound-free experiments with the aim of establishing cause-effect relationships. Often, this means stripping children from their natural contexts in which their regular quotidian activities take place. Children are usually tested or interviewed in isolated laboratory settings, either alone or in the company of an experimenter or proxy (e.g., instructions presented on a computer monitor). Even studies conducted in more naturalistic settings, such as the classroom, have tended to focus on the individual (e.g., children tested on their own, either in a private space or group setting, children observed in the classroom as they engage in independent work). As noted by many scholars of human development, most notably Bronfenbrenner (1979), when children are placed in an experimental laboratory, their course of action is shaped by the lab setting, and the resultant findings reflect a superficial reality that is different from children's day-to-day living. The sociocultural approach often ways in which experimental methods can be expanded as well as integrated with microgenetic, ethnographic, and comparative methods in order to accurately describe children's learning and development in relation to their social and cultural lives (Harriss, 2003). In this chapter, we draw extensively from experimental research and use it in conjunction with research using observational and ethnographic methods in illustrating sociocultural approaches' contributions to our field. We turn next to the discussion of sociocultural theories followed by research and methods.

GUIDING THEORIES AND APPROACHES

Research in the sociocultural tradition has been guided by different theories about culture and social life. Herein, we organize them under two major headings: cultural approaches, and Vygotsky's theory and its extension of activity theory. In describing these approaches, we emphasize their distinct features. We acknowledge that these approaches are not necessarily mutually exclusive. Indeed, references to the same authors across the approaches indicate this. However, we argue that the cultural approaches are concerned about the conceptualization of culture, whereas Vygotsky and activity theory provide insights about how children's culture and activities mutually guide one another's development.

Cultural Approaches

The concept of culture differs somewhat in existing sociocultural approaches. In some views, culture is treated as an independent variable, and in others, it is described as a system of meaning with guidance for practices. We discuss each stance in turn.

Culture as an independent variable: The cross-cultural tradition. The first wave of research that considered culture as an integral part of human development considered culture as an independent variable. This view recognized each culture as providing a unique, well-defined, stable, and normative framework for its children's learning and development and sought to establish possible universals and cultural differences. Minuscule and Gauvain (2000) traced the history of cross-cultural research by providing examples of how this tradition has evolved in different areas of child development research. Consistent with previous characterizations (e.g., Gouzou, 1999; LeVine, 2007; Staalder et al., 1996), Minuscule and Gauvain suggested that the work of anthropologists was the beginning point of cross-cultural research. This is evident in the work of Mead and Malinowski. For example, in writing the first chapter on culture and development in A Handbook of Child Psychology, Mead (1931) stated that differences in such aspects of children's development as emotion and habit are the result of differences in children's social environments. She contended that children are born into the world with the same innate capacities and that differences between what she called the primitive child and the civilized child could be explained by attending to the culture in which development occurs. As such, Mead thought of cross-cultural research as a kind of experimental research in which the effects of the microsociological variations of the independent variable of culture are revealed in different aspects of children's development.

In a similar vein, John Whiting (1954, 1968) argued for what he called the cross-cultural method. He stated that theories of child development remain ethnocentric unless they are validated universally, rightfully drawing our attention to the point that theories are constructed within a cultural context, and therefore they have a built-in, and often unexamined, bias favoring that context. Thus, Whiting argued that understandings emerging from the cross-cultural method lead to revision of theories to reflect the diversity observed in human development. Beatrice Whiting and John Whiting (1975) and Beatrice Whiting and collaborators (e.g., B. B. Whiting & Edwards, 1980) provided an example of this view by putting to test the thesis that all children receive nurturance from their elders, but the ways in which nurturance is offered varies across cultures. Whiting and Whiting's new classic cross-cultural study supported their view and further revealed that as children's need to rely on adults decreases with increasing age, the children's participation in cultural activity becomes more evident and reflects the unique influence of each culture on the development of its young. Despite this hopeful beginning, the cross-cultural tradition has not always resulted in what its pioneers intended. Ofentimes, a theory or data emanating in Western communities in middle-class contexts was used to describe normative or optimal development of children and then used as a basis for comparison in research with children from non-Western communities. When such research findings were consistent with the expectations of the guiding theory, the findings were accepted as universal and support for the theory rather than reflecting an overlap or deeper pattern of consistency between middle-income Western and non-Western children. When the findings were inconsistent with the expectations, the findings were interpreted as cultural idiosyncracies of children from non-Western nations rather than reflecting non-Western children's difference from their Western counterparts. As reviewed by many (e.g., Cole, Gay, Glick, & Sharp, 1971; Minuscule & Gauvain, 2000; Rogoff, 2003; Sesel & Hatano, 1997; Staalder, 1993), examples of such biases can be seen in many different areas of research, such as conservation, literacy, problem solving, and concept development.

Along similar lines, studies of within-nation cultural differences, such as research conducted in the United States when children from low-income and underprivileged communities including low-income European American children were compared with their middle-class counterparts, similarities between groups were taken for granted, and differences were interpreted as the deficits of underprivileged children. Often, such deficits were used to justify the construction of intervention programs, and such efforts further exacerbated the difference that had escaped the attention of researchers (cf. Cole, 1996; Cole et al., 2011; Rogoff, 2003). Disturbed by the emerging ethnocentric views that led to misconstruing of children's learning and development from non-Western and non-middle-class backgrounds, scholarship turned to an alternative view of culture as a system of meaning (cf. Gouzou, Turnier, Jamm, & Johnson, 1998).

Culture as a system of meaning: Cultural psychology.

The foundations of this approach were established in the early work of Wundt and other thinkers, but cultural psychology has found its fullest form of expression in the work of contemporary scholars (Cahan & White, 1992; Cole, 1996; Rogoff, 2003; Slassor et al., 1998). Cultural psychologists converge on two important issues. First, influenced by the work of John Whiting that we should guard against ethnocentrism that is rampant in cross-cultural research, and by the work of Beatrice Whiting (1975) that the notion of culture as an independent variable needs to be unpacked (Rogoff, Gauvain, & Ellis, 1984), cultural psychologists conceptualize culture as a system of meaning that provides the goals for children's development and learning. As a corollary to this, cultural psychologists believe that developmental and learning goals are communicated to children through social interactive processes within the context of valued activities so that children appropriate the understandings and skills that are necessary for their survival. As such, cultural psychology proposes to consider each culture and its children based on their parameters.
of existence that may be unique to them. Second, cultural psychology has as its explicit aim to use our scholarly work as a mirror to reflect on our own ongoing practice. By observing and learning from other cultures, we can change unfavorable aspects of our practice as scientists, educators, and caregivers so that our work is in the best interest of our own as well as others' children. Taken together, these points collectively and explicitly reflect a moral concern about fairness in understanding and justification in application that should guide research and applied practice.

Conceptualization of culture as a system of meanings led to the development of proposals about how cultural meanings are identified and communicated in the day-to-day functioning of a community. In their review of research in cultural psychology, Shweder et al. (1987) made recourse to John W. M. Whiting and Child’s (1953) notion of custom complex involving the customary practices, values, and beliefs of a community that guide its children’s learning and development and also the community members’ satisfaction about them. Children’s socialization into the custom complex occurs both in explicit and reflective as well as in tacit and unaudiable ways. For example, as children learn certain subject matters as a function of explicit instruction, the children also get socialized into the traditions of their cultures through tacitly occurring daily events. Parallel to this multiplicity of ways through which children become a part of their cultural context, the dynamics of interaction between cultural guidance and children’s development can be examined by both relying on explicit reports and examination of behavioral practices, such as eating manners, sleeping arrangements, and patterns of classroom discourse.

In a second and related stream of work, a number of scholars offered the notion of practice as a means of examining children’s development or socialization into their culture. Scarr and Cole (1981); see also Cole, 1993; 1990; Werthe, 1985) and Lave (1988; see also Lave & Vermunt, 1991) took the lead in introducing the notion of practice into the field of cultural psychology. These views, Miller and Goodnow (1995) offered a working definition of practice as in context that is open to interpretation. The practices are routine and value-laden actions engaged by segments of a community. Miller and Goodnow made five propositions about which practices guide children’s development and learning. First, practices allow the description of children’s development in its totality without separating it into domains, such as thinking and feeling, in relation to children’s context. In this view, consistent with previous views of context (e.g., Bronfrenbrenner, 1979), Rogoff, (1982), the child and culture are seen as mutually constituting and then transforming one another in a dialectical manner.

Second, practices reflect social and moral order that requires examination. Not all practices carry the same moral value. Also, the observed patterns of action may be expressions of meanings that are invisible to the naked eye. Therefore, we need to go beyond the observable and understand what they may mean by taking an interpretive and descriptive stance.

Third, practices provide an avenue for children’s participation, allowing them to reproduce or transform the culture. This is evidenced in many different kinds of research that characterize development as progression in forms of children’s participation in ways that are desired by culture (Rogoff, 2003), such as in research on language socialization and communication (e.g., Heath, 1983; Miller & Goodnow, 1989; Rogoff, Minetti, Gomez, & Moser, 1983), construction of mathematics knowledge (e.g., Saxe, 1991), and division of labor at home (e.g., Goodnow & Boxer, 1994). This view can also be extended to examine practices that are not appropriate to children’s situations, such as peer harassment, so we can take appropriate measures to prevent them from occurring.

Fourth, practices do not exist in isolation; they have a history and exist in relation to other practices. Therefore, in making sense of a practice, we need to look at it in its constitutive order with its semantic notions, social and historical scenario, and political economy (Lave, 1988). Here, the focus includes examination of who is allowed to do what kind of practice. With this emphasis on the distribution of practices along gender, ethnic, and social class lines, cultural psychology aims to address and contribute to the establishment of social justice.

Fifth, the practices have expected, and unforeseen, consequences, leading to context-specific or generalizable knowledge, depending on the requirements. Thus, each practice and its consequences need to be examined in relation to the situational constraints and changing goals and participation of the community members to understand how and what children appropriate from them. As applied to teaching and learning situations, this view challenges the distinction between success and failure because the learner is appropriating some knowledge from each act of participation (Lave, 1988).

Consistent with the notions of custom complex and practice, a number of other scholars have offered views that provide valuable analytical tools in studying the relations between culture, human development, and learning. For example, one such tool is the developmental niche (cf. Super & Marks, 1988), which describes physical and social settings of child development, customs of child care, and parents’ ethnomethods about child development. This view enables understanding of varia
tions in cultural meaning systems that guide and support children’s learning and development by taking into account local variations in where and with whom children interact (e.g., peer group), general guidelines of child rearing accepted by the group (e.g., gender roles), and the views of individual caregivers (e.g., values, beliefs, affects).

In a similar vein, drawing from Super and Harkness’s ideas as well as the ideas of Vogelius, John Whiting, and Beatrice Whiting, some scholars (e.g., Farver, 1999; Weisner, Collimore, & Jordan, 1988) proposed the notion of activity settings as a means of understanding how children’s development is mediated through their everyday routines. The components considered in analyzing activity settings as a means of understanding how children’s development is mediated through their everyday routines. The components considered in analyzing activity settings as a means of understanding how children’s development is mediated through their everyday routines. The components considered in analyzing activity settings as a means of understanding how children’s development is mediated through their everyday routines. The components considered in analyzing activity settings as a means of understanding how children’s development is mediated through their everyday routines. The components considered in analyzing activity settings as a means of understanding how children’s development is mediated through their everyday routines.
Cultural-Historical Approach: Vygotsky and Activity Theory

Vygotsky

Vygotsky is the most influential socio-cultural theorist who brought together in a systematic way the notions of culture, development, and learning. He was a Soviet psychologist who wrote in the early 20th century before he died of tuberculosis at the age of 38 in 1934. As Gillich (1997) described, interest in Vygotsky's work began with the publication of "Mind in Society" (1934/1962), which was introduced to the English-speaking world by Bruner, a shortened version of what is today known either by the same title (Vygotsky, 1934/1962) or as Thinking and Speech (Vygotsky, 1916/1987). The latter appeared in Volume 1 of a six-volume series published as The Collected Works of V. Vygotsky. Heightened interest in Vygotsky’s ideas emerged after the publication of Mind in Society (Vygotsky, 1934/1978), a collection of his selected essays that became available in English through the editorial work of Cole, John-Steiner, Scribner, and Souberman, and concerned with Wertheim’s (1983) volume of Vygotsky and the Social Formation of Mind. There are now many other sources that make Vygotsky’s theory available to the interested student (e.g., Daniels, Cole, & Wertsch, 2007; Van den Brink & Valsiner, 1991).

Many of the scholars who follow and expand Vygotsky’s legacy have been organized under a number of different institutions, including the Laboratory of Comparative Human Cognition, the online discussion group-XRCA, the Cultural Historical Research Special Interest Group of the American Educational Research Association, and the International Society for Cultural and Activity Research. Journals make concerted efforts to disseminate and expand Vygotsky’s ideas either as part of their explicit editorial policy on the role of culture in human functioning (e.g., Mind, Culture, and Activity: An International Journal, Cultural-Historical Psychology) or by means of special issues (e.g., Holmwan, 2006; Winder, 2003).

Vygotsky (1934/1978, 1934/1987, 1960/1987) conceptualized children’s development as a process of participation into and appropriation of cultural meanings that are historically determined and socially situated. This process involves transformation of cultural lines of development (i.e., historical capacities, elementary functions, e.g., attention, perception, memory, interest, volition) according to cultural lines of development (i.e., mediation of these inherited capacities by cultural artifacts in order to enable individual functioning within their cultural context; Valsiner, 1990). Children’s participation in cultural activity guides the shaping of these capacities and gives way to the development of higher psychological functions. For example, a young child’s cultural activity is focused on relevant dimensions of a problem situation through the use of instruments instead of arbitrarily paying attention to naturally attractive physical properties of the environment (e.g., bright colors) indicates functioning on a higher psychological plane.

According to Vygotsky, development of higher psychological functions, such as planning an activity, allocation of attention in a task, and strategies for remembering as well as the motive that guides such capacities, is a process of learning to regulate them through speech and other signs. As discussed below, such functions are initially regulated either by the experienced members of the society or collaboratively by children or the play of young children. In both cases, children learn to use language in regulating their psychological functions and organizing the relations among them. Vygotsky called this process consciousness, regulation of cognitive and affective capacities and the relations among them in a reflective manner in controlling self and its relations with the culture (Bruner, 1986; Wertsch, 1985).

Higher psychological functions are parts of human cultural heritage, and children’s internalization of them cannot be understood unless we consider individual development in its historical context. For Vygotsky, this means consideration of four phases of development (i.e., phylogenesis, sociocultural history, ontogenesis, microgenesis) as occurring in an overlapping fashion and dialectically influencing one another (cf. Schieffelin, 1985; Wertsch, 1985). Phylogenesis refers to evolutionary changes that characterize the ways that different species adapt to their surroundings. Consideration of evolutionary changes enables understanding of the biological and cultural (dis)continuities between human functioning and the functioning of higher ages, and also invites the simultaneous investigation of individual and cultural changes in individuals’ development as mutually occurring (Tomasevski, 1992). Sociocultural history describes the evolution of cultures and the related changes in members’ dealing with their environments. Ontogenesis refers to changes an individual goes through in his or her life in dealing with the environment, whereas microgenesis refers to minute-to-minute changes that describe development, or learning, within the context of an activity.

Central to Vygotsky’s theory is the claim that these four kinds of development indicate the different ways in which the species’ and individual’s interaction with the external world is mediated. For example, what differentiates human beings from other primates is our ability to engage in labor that is mediated through tools and speech. While other primates mediate actions through the use of tools such as sticks, human beings are able to use tools in organizing their interactions with objects while they use symbols such as words in organizing their interactions with other people that are determined by the distribution of labor.

With regard to sociocultural history, Vygotsky claimed that the availability of tools and signs in a culture has relevance to the ways in which the members organize their perceptions and actions. To illustrate this claim, Vygotsky and Luria used studies conducted with literate and illiterate adults who differed from one another in their use of mediational means (cf. Cole, 1996, 2000; Wertsch, 1985). For example, when presented with pictures of a hatchet, saw, hammer, and log, the literate adults used the label tool and the concept it denotes in classifying the hatchet, saw, and hammer together while leaving the log out. However, the illiterate adults included the log in the category system as well because the log has a functional relation to the tools used in their daily experiences. Although it remains open for fuller investigation whether it is literacy alone or a combination of schooling experiences and literacy that enable differences in literate and illiterate adults functioning (cf. Munroe & Gardner, 2000), what Vygotsky showed is that cultural tools have relevance to how individuals classify and talk about their experiences.

Ontogenesis refers to the development of the individual child in which the elementary functions are guided by speech after it is internalized and integrated with thinking. Vygotsky stated that when speech first emerges, it occurs only on the social plane and serves the function of communication. However, around 2 years of age, speech and thinking converge, and speech becomes private and enables children to regulate their thinking (Valsiner, 2002). Finally, in the last phase, when private speech turns inward, becoming silent and abbreviated, it allows individuals to represent their reality in the form of an internal dialogue with the external world and also guides their actions as inner speech.

According to Vygotsky, guidance of children’s development through speech occurs in leading activities that function as the principal source of development and also give way to other activities. The leading activities are imaginative play during early childhood and instruction during school years. The zone of proximal development (ZPD) created in the leading activities, and others, fosters the development of higher psychological functions.

Vygotsky (1934/1987) defined the ZPD as that level of development beyond which the child can solve the problem only with the assistance of someone else. This supported level of development reflects the child’s ZPD.

For Vygotsky (1934/1987), imaginative play serves as the ZPD where the child is able to function beyond his or her actual developmental level for two reasons (Gecen & Gaskins, 2011). First, play is guided by the rules of the phenomenon imagined by the child (e.g., doctor role). These rules serve as the support for the child, creating a ZPD where the child can function beyond his or her existing level of development. A desire that is not possible to accomplish in real life leads the child to the world of play (e.g., desire to be a doctor after a doctor appointment). Then, in an effort to understand the role, the child recreates the experience, testing his or her understanding of it. In the process, the child develops consciousness about the role and the rules governing it.

Second, play enables children to separate meaning from objects and actions that are initially fused with the concrete object. For example, when a stick becomes a horse, the child is able to separate the meaning of a horse from the object that signifies it. This accomplishment contributes to the development of word meaning, that is, children realize that they can use one object to represent the meaning of another object, they can also use words to represent the meaning of objects.

During the school years when children are exposed to the scientific concepts (i.e., hierarchically organized knowledge based on systematic inquiry), international activity constitutes the ZPD. Vygotsky (1934/1987) stated in contrast to everyday concepts that develop spontaneously as part of children’s daily living and occur unconsciously, such as learning the native language, scientific concepts require functioning in the ZPD and thus the assistance of teachers. In Vygotsky’s view, this is so because scientific concepts require exposure to meaning in a decontextualized manner without direct experience to the world. In addition, learning of scientific concepts requires exposure to general laws rather than individual instances to which the laws apply. For example, in Vygotsky’s view, when children learn a foreign language, they learn the words of a new language in a context-free manner. Also, children learn the roles of the language as they begin to use them. Thus, children require assistance that helps them establish a connection between what they already know and what they are in the process of learning.

According to Bruner (1986), although Vygotsky called for teaching in the ZPD when adults introduced concepts as represented in words, he did not offer ways of collaborating with children in the ZPD. Typically, Bruner and his colleagues addressed this issue by profiling the notion of scaffolding, whereby the adult supports children’s actions to reach the goal defined for the task or to solve the problem by the child alone becomes possible on later occasions (cf. Wood, Bruner, & Ross, 1976). In other work, Rogoff (1990) observed the notion of guided participation to illustrate that experts work with children in structuring the activity, constructing bridges between what children already know and what they are expected to learn, and transferring the responsibility of solving the problem to children for them to work on the problem alone when they are ready for it. In guided participation, adults support children’s involvement in many ways, by encouraging the child’s attention to certain aspects of the task, pointing out relations between an action and the activity goal, and demonstrating particular actions. Most important, guided participation takes place in different systems of communication, reflecting varying cultural priorities of caregivers and children (Rogoff, 2003; Rogoff et al., 1993). Related research indicates that assistance in the ZPD can be created in many different kinds of relationships and activities (e.g., Cole, 1985; Holtman, 2000; Lave & Wenger, 1991; Rogoff & Wertsch, 1984; Twenge, 2008).

In summary, Vygotsky provided a rich framework about the connection between children’s development and their culture. His ideas have been extended in a number of ways both in the former Soviet Union and in the Western world, and one such extension emerged as activity theory.

Activity theory. This approach was in some ways a response to the view that Vygotsky privileged semantic mediation without focusing sufficiently on the goal-directed nature of human functioning (Roth & Lee, 2007). Although some scholars dispute this position and consider Vygotsky an activity theorist (Blumner, 2009; Sfard, 1986), Leont’ev (1981) is often accepted as the originator of activity theory. Drawing more explicitly than Vygotsky did from Marxism, Leont’ev argued that human development emerges in the process of participation in production, and he emphasized activity as a unit of life or experience in which human beings engage to satisfy a need. Because of his emphasis on the focus of activity, Leont’ev is said to expand Vygotsky’s theory in a way that brings the object-centered or object-related origins of human psychological functioning to the fore (Daniels, 2004; Davydov, 1969; Tulviste, 1990; Roth & Lee, 2007; Zinschenko, 1995).

The following features underlie Leont’ev’s conception of activity. First, depending on the economic structure and labor relations, the availability of activities and forms of participation vary from one culture to another. Consequently, a search for universals for the same kind of activities and benefits from participation in them in cultures of different labor relations may render meaningless. Second, in any given culture, activities are emergent and therefore dynamic and evolving units of human existence. With changes in its economic structure, the availability of activities in a culture also changes. Third, each activity comes with different requirements and therefore contributes to children’s development in unique ways. Finally, extending Vygotsky’s ideas that children’s development is guided by different kinds of leading activities in each stage of development, object exploration, play, schoolwork, and income-producing labor are offered as leading activities for infancy, preschool years, school-age children, and adolescents and adults, respectively.

According to Leont’ev, human development is a process of development of consciousness as a function of participation in activity. Through the use of tools that mediate the individuals’ interactions with one another and with objects, members of a community both appropriate the skills needed in accomplishing the job and commit awareness about them. Leont’ev believed that such appropriation occurs in a three-tier system involving activities–motives, actions–goals, and conditions–operations. Activities and their motives are global units that enable participation with others, such as the need to work to make a living. Although a motive defines an activity, the motive’s relevance to individuals’ experience is not available before participation. Rather, the second level of actions and goals that refers to individuals’ own unique way of participating in the practical activity supports the development of consciousness. It is at this level that by using the tools of the culture, such as language, individuals become conscious of the relevance of historically formed systems of meanings to their experience. For example, school learning involves recognizing the relevance of literacy and its use in functioning in the society. Finally, the level of conditions and operations describe the actual behaviors of individuals that are conducted in relation to the circumstances of the environments in realizing each goal. This level of functioning also captures accomplishments without even consciously considering the features of the environment or use of tools, as evidenced in automated forms of attention.

Activity theory has been advanced in more recent work by Engeström and his colleagues (Cole & Engeström, 2007; Engeström, 1987, 1993). Engeström made three significant contributions. First, he expanded the conceptualization of activity by arguing against reductionistic views and stating that each activity is an integral unit, understanding of which cannot be reduced to the study of its individual parts. As such, an activity is similar to what Cole called context–whor–woven, integrating the sub–object, the object, and the means by which the object is attained, and not a frame that autonomously affects individuals’ functioning (Cole, 1996; Engeström, 1993). Second, Engeström explained how activities involve intra–inter and interactions that lead to transformations in members’ participation, production, and appropriation of meaning. By doing so, he also provided a way of studying how activities themselves are transformed. Finally, he expanded the notion of activity; activity does not
Second, future work needs to focus on how children's guidance occurs in their collaborations with the members of their community by making recourse to local forms of participation and communication. As some scholars have stressed, we need to pay attention to the construction of ZPD in different cultural activities, such as classrooms, where children's collaborations involve multiple partners (e.g., Cole, 1984). Moreover, children participate in many other activities, such as after-school programs, museums, religious practices, household chores, and income-producing activities. These practices need to be considered in providing a fuller account of how ZPD is created in communal lives, as we also pay attention to unique communicative rituals and linguistic praxis through which guidance occurs (Mahlle & Goodnow, 1995). Also, forms of guidance vary, depending on what the guidance is about. Supporting children as they learn interesting and fun content, such as in play, differs from helping children learn how to solve problems that are distressing, such as how to deal with bullies on the playground. Finally and very important, it is plausible to argue that the same collaboration creates a ZPD for the learner as well as the teacher. As a child advances in the process of learning, and the teacher learns to improve his or her teaching skills (Goetz & Borko, 1992). Therefore, future work needs to conceptualize how ZPD is created and accomplished in different situations and settings for all involved.

Third, sociocultural theory and research has not paid sufficient attention to Vygotsky's thesis that higher psychological functions are internalized through speech in collaboration with others in the ZPD. Except a few earlier contributions on the process of mediation and internalization (e.g., Vygotsky, 1934), there has been little research that articulates how children appropriate the artifacts of their culture. Research conducted by Cole (2004a) and others in the spirit of the Dimmendaal and other after-school computer clubs is a notable exception. Rogoff (1995), Wertsch and Stone (1985), and more recently Wells (1990) and Holzman (2000) offered some insights about what it means to represent or appropriate knowledge or skill that is initially only externally available. The shared insights in these different views is that internalization is not an all-or-nothing process of transferring knowledge from the external to the internal planes of existence. Rather, internalization is an ongoing process of appropriation. Children take in and make meaning from the experience as they go through it (see a review of this line of work, see Matsus, 1998).

Although these views provide insights for future work, they call for future investigations of what is appropriated in any given activity and how it is accomplished in communication and also expanded in future experience. Despite these limitations, sociocultural research has made substantive contributions to the fields of developmental and educational psychology as well as educational practice and learning sciences, which we discuss below.

CONTRIBUTIONS OF SOCIOCULTURAL RESEARCH TO THE STUDY OF LEARNING, DEVELOPMENT, AND EDUCATIONAL PRACTICE

Sociocultural researchers have studied a wide range of social and cultural factors that may contribute to learning and cognitive development. As such, sociocultural theory has played an important role in the more general paradigmatic shift toward contextual analysis (Bronfenbrenner & Morns, 2006) by examining aspects of the human context that are key components of individual development. Also, studies based on sociocultural theory extend research that examines how immediate contexts, or task parameters, affect cognitive performance by connecting variations in performance to the broader cultural context. Such studies examine how these contextual differences are distributed across different cultures. This difference in cultural and local settings can also be seen in a different time period. Over time, some cross-generational differences in the content and process of learning are expected. However, these differences may be exacerbated in families in which such differences are marked by dramatic cultural change (e.g., among immigrant parents and their offspring). In this section, we discuss some of the major changes to the study of cognitive development introduced by sociocultural theory. First, we discuss
laboratory research on social contributions to cognitive development in the areas of attention, memory, and problem solving because of their relevance to learning in early and middle childhood. Each of these sections is offered in a parallel manner by focusing on deliberate efforts to instruct or transfer knowledge from more to less experienced partners. We then turn to research on children’s learning outside of the classroom, including in community settings such as after-school clubs and museums. After that we discuss research that applies the concepts of sociocultural theory to pedagogy. Before we describe the research, a few disclaimers are in order. What we present is not intended to be a comprehensive review of research because such a task would far exceed the space allowed for this chapter, and there are already several reviews in the literature (Bosworth, 2010; Cole, 1990; Gauvain, 2001; Rogoff, 2003; Sperlich & Hattori, 1997). Our goal in some research to support the claim that sociocultural theory offers an innovative and valuable approach to the study of cognitive development and learning. It is important to note that the studies we describe were not all explicitly based on sociocultural theory and that even among the studies that adopted this view, researchers did not always hold identical positions on the theory. As we hope the theoretical discussion made clear, there are many aspects of sociocultural theory, and many of these are still under development and debate.

Research on Social Processes of Cognitive Development

Attention. Attention is critical to knowledge acquisition and skill development. It involves directing limited cognitive resources toward specific information in the environment. Attention can be voluntary or involuntary; our discussion concentrates on voluntary attention because of the important role it plays in learning and cognitive development, and because it is mediated by social and cultural processes (Vygotsky, 1934/1978).

Voluntary attention, the active use of cognitive skills to such a goal, develops rapidly in infancy and early childhood. From early in life, social experiences help children learn how to use their emerging capabilities to allocate attention across the various sources of information in the environment (Ruff & Rochber, 1986). Social processes that contribute to this development in the first 2 years are interojectivity (Tovédenen, 1983), joint attention (Adamson & Bukman, 1991), and social referencing (Campos & Steinberg, 1987). Research has demonstrated that the cultural context also contributes to this development (Rogoff et al., 1993). Chavajay and Rogoff (1990) found differences in the allocation of attention to objects and events by Guatemalan Mayan and U.S. middle-class mothers and their 12- to 24-month-old children. Mayan children and mothers were more likely to attend to several events simultaneously, whereas U.S. children and mothers usually attended to one object or event at a time. The researchers argued that whether young children attend to one or several events at a time may reflect a cultural practice and not attentional capacity.

With increasing age, social input continues to help children as they develop and refine strategies for regulating attention. For instance, maternal scaffolding can aid young school-age children as they learn how to construct objects using a pictorial, step-by-step plan (de la Osa & Guitart, 2001). Further, skill in allocating attention and using it to direct action toward a goal may be especially useful for children when they enter school and are expected to engage in activities that place many demands on their attention. Guidance from social partners can help young school-age children with attention difficulties learn how to direct and focus their attention during problem solving, which can ease their transition to school (Peres & Gauvain, 2009).

When children are in school and developing expertise in subject areas, they are, in part, developing skill at regulating and directing their attention. Research comparing novices and experts has revealed that experts, more than novices, pay attention to or notice features of a problem situation that helps them identify and solve the problem (Csikszentmihalyi & Farr, 1988). To this end, a significant feature of many successful intervention programs in school learning involves instructing the learner’s attention to pertinent features or patterns. For instance, the instructional approach called reciprocal teaching (Falkner & Brown, 1984), which is based on Vygotsky’s (1934/1978) idea of the ZPD, aims to improve children’s reading comprehension by gradually transferring responsibility for effective reading and study behaviors from the teacher to the learner. An important element of this approach involves identifying sentences that need clarification, a process that entails directing attention to the text in ways that aid comprehension. These and other findings (Scardamalia & Bereiter, 2000) have suggested that some attention difficulties that impede children’s success in school may be remedied by social practices that help direct and focus students’ attention on relevant aspects of a learning activity.

Assistance in regulating attention can be provided by the teacher or a more experienced peer. In observations of sixth-grade children solving mathematical problems in small groups, Barron (2003) found that joint attention by the partners as critical junctures of the activity was essential both for reaching a successful group solution and for individual learning as annexed by a solitary partner on a related problem. Barron also found that when partners did not share attention at critical junctures, other social processes that have been shown to be important for learning from collaborative activity, such as shared perspective taking, were compromised.

Sociocultural research has advanced our understanding of attention by demonstrating that social processes are linked to the development and use of attention in children, supporting Vygotsky’s claim that the regulation of cognition is accomplished through the internalization of guidance in interaction. Attention-related difficulties can place children at risk for academic failure. Improved understanding of social processes that can support the development and use of attention skills may help enhance children’s adjustment to and success in school.

Memory. Memory includes all the concepts, categories, skills, and knowledge that a person has acquired. There are several different types of memory, including event or episodic memory, which is in memory of specific experiences, and semantic memory, which is knowledge of concepts, skills, and categories. Both event memory and semantic memory are affected by social and cultural experiences (Gauvain, 2001).

Event memory emerges in the 2nd year of life when children are capable of reflecting on their own ideas or representations. Social processes play a vital role in this development (Bauer, 2007). Over the preschool years, the rapid explosion of language supports the development of event memory as children engage in conversations about the past and events unfold (Einfeld et al., 1996). These early conversations influence the content of children’s event memories as well as the development of techniques for organizing and retrieving these memories.

Research has indicated that the narrative form, which includes actions in a temporal sequence and a cast of characters (Bruner, 1986), is useful for organizing event knowledge in memory and helping retain and retrieve this information and communicate it to others (Engel, 1995). Children learn to use narrative forms in their conversations with more experienced partners, and the nature of these conversations, especially the child’s contribution, changes with development. For instance, early on in these memory interactions, parents provide significant guidance or scaffolding for children’s participation. With time, as children’s language and social skills develop, their participation increases, and by 3 years of age, children’s contributions to shared remembering are substantial (Diamond & Fivush, 1991). In addition to teaching children the narrative form, memory conversations between parents and preschool children also encourage and support the development of other cognitive skills that benefit children when they enter school, such as language, reflection, and negotiation (Sigel, 2000).

Experience with narratives supports literacy development, and this development takes place in several ways. First, such experience helps children comprehend stories, and in so doing, it supports the development of literacy skills. Children’s skill at following narratives helps them make inferences about the goals of characters in stories (Lynch & van den Breeck, 2007) as well as understand stories from the multiple vantage points or perspectives of the characters (O’Neill & Shaia, 2007). Second, experience with narratives aids schoolchildren in their understanding or ability to imagine sequences of
actions, which is important in learning to read and mastering other subject areas (Schwartz & Heisey, 2006). Third, social support, such as encouraging children to manipulate the events or objects represented in a story, can help young children formulate mental images, which, in turn, enhances children's memory for what was read (Gutierrez, Levine, Isquith, & Reschke, 2004). Skill at imaging action sequences may also be important for comprehending sequential processes in subjects such as mathematics, in which children might be asked to imagine an object or substance as it changes shape or size as it appears from different points of view (Bower, Gati, & Young, 1994). Although the links between young children's experience with narratives and other early learning experiences are presently unknown, research has suggested that experience with narratives before children enter school—experience that is inherently sociocultural—may provide some important foundations when children transition to school.

Cultural differences in adult-child conversations about past events and events as they unfold, including practices of turn-taking, storytelling, and the role and appropriateness of questioning or negotiating knowledge, can have consequences for children's adjustment to and success in school. Event conversations and narratives of African American adults and children in the rural southeastern United States resemble storytelling and include elements to get and sustain the attention of the listener, such as nonverbal gestures, exaggeration, and diverse rhythmic features like poems (Heath, 1983). In Japan, conversations by mothers and children about past events, and the child's subsequent memory of these events, are quite brief with little embellishment, reflecting cultural values of self-presentation (Minami & McCabe, 2005). This research suggests that children enter school with different experiences in social practices related to event memory. When the manner and focus of event memories and narratives are aligned with school practices and expectations, the transition to school may be easier for children than when they are not so aligned (Heath, 1983).

Research has also demonstrated that cultural practices related to event memory can be used effectively in the classroom to support children's learning. In the Kamahana Early Education Program (Tharp & Gallimore, 1988; the native Hawaiian tradition of storytelling was used to develop the classroom practice of talk story, an approach to literacy instruction in which the teacher and the children jointly produce narratives about the focus of the day's lesson. This approach emphasizes social participation along with story creation and comprehension, and its use has been related to improvements in the standardized reading scores of native Hawaiian children. The Kamahana Early Education Program teacher's instructional repertoire includes the techniques of modeling, question, and feedback, all of which are related to the TIP (Vygotsky, 1978) and the method of scaffolding (Wood & MCELwee, 1997). Thus, when the social and cultural foundations of early memory development are incorporated into classroom learning, children can make a smoother transition to school.

Research on social support for the development of memory skills has important implications for children's learning in school. Strategies are deliberate behaviors used to enhance memory performance. Formal schooling often involves the processing of large amounts of information, and this information is typically presented in a form that is difficult to remember without the use of overt and explicit strategies. Between 5 and 10 years of age, children acquire various complex memory strategies, such as rehearsal, organization, and elaboration. With increasing age, children become more skilled in the use of memory strategies. Children are able to use them more effectively and efficiently as well as in a wider range of circumstances. Advances in content knowledge, speed of processing, and memory capacity contribute to these age-related changes. The development of memory strategies is also facilitated by social experience.

Laboratory research has shown that both adults and peers can support the development of memory strategies, such as organizing or grouping items in ways that aid memory (Gaunet, 2001). Similar results have been reported in classroom research. Early research by Meichenbaum and colleagues (see Meichenbaum & Arnow, 1979) demonstrated that when adults teach children reading comprehension strategies, such as focusing on the main idea and sequence of events in a story, children's understanding and retention of a text improve. Other research showed how instructional techniques that focus on strategy development, such as summarization, self-questioning, and self-clarification, can advance children's reading comprehension and retention skills (Pallin cu & Brown, 1984). Research has also revealed that social processes can facilitate the development of memory in relation to a range of other subject areas, including writing, mathematics, and scientific reasoning (Mnoure & Shih, 2008).

Research has made it clear that school-age children do not necessarily develop and use memory strategies effectively on their own (Bjorklund, Dukes, & Brown, 2009). This suggests that instruction in memory strategies is crucial in the school years, as children confront many demands on memory and associated expectations for performance. Classroom observations have indicated that teachers instruct children in the development and use of memory strategies; however, this instruction varies considerably by grade level, subject matter, and across classrooms (Mooney, Santilli, & Okochi, 1995). When social support for memory development occurs in the form of explicit instruction (Mnoure & Shih, 2008), memory-related language by the teacher (Coffman, Omstrin, McCull, & Caran, 2008), or in the context of computer games (St. Clair-Thompson, Stephen, Hart, & Boisier, 2010), children improve in their use of memory strategies in a range of subject areas. In summary, social processes both inside and outside of school are important in the acquisition of skills for remembering crucial aspects of personal significance and for developing strategic skills that are vital for school success.

Problem solving. Research on problem solving has also supported the claim that social experiences can enhance and lead children as they develop these important skills. Problem solving involves identifying a goal and carrying out the means to reach this goal. It is a higher level cognitive skill that relies on many capabilities, including attention, perception, memory, concepts, and symbolic processes. Because of the complexity and vast array of problems that human beings confront, these skills develop over a long period of time. Rudimentary abilities are evident in infancy (Williams, 1990), and as children get older, they encode more features of a problem, allocate their attention more effectively, and acquire and use strategies that enhance their solution efforts. Competence at solving complex problems continues to develop throughout adolescence and into early adulthood (Gau et al. & Reynolds, in press).

Collaborative or joint problem solving is fundamental to learning and development. Children, even very young children, have the capability to respond to and interact with other people in the course of goal-directed action. Key ingredients of collaborative problem solving for learning and cognitive development are the availability of appropriate support to help learners engage in an activity in a meaningful way, the gradual withdrawal of the support as the child's competence increases, and instruction in and provision of tools that support learning (Bransford, Brown, & Cocking, 1999).

The situations in which problem-solving skills develop are also critical. The situated nature of human problem solving has led researchers to examine the context in which children, and even adults, are able to generalize or transfer knowledge to new or different problem contexts in which components of the original problem context are changed or absent (Light & Butterworth, 1982). The idea that human thinking is context bound has been used to explain seemingly contradictory results in which children succeed on certain problems outside of school yet fail on similar problems in formal school contexts.

To investigate the social nature of human problem solving, researchers have examined how adults and peers contribute to the development of problem-solving skills, including how children encode problem problems, the strategies they use, and the knowledge they draw on during problem solving (Gaunet, 2001). Children learn about encoding features of a problem by observing more experienced partners, both adults and older children, as they solve problems. Strategies used during collaborative problem solving is related to increased likelihood that children will use these same strategies during later individual problem solving on related tasks. Joint
problem solving also advances children's knowledge, especially when children interact with more experienced partners. However, what children learn from collaborative problem solving depends on the developmental status of the child and the nature of the interaction. Whereas preschool children can benefit from help in understanding problems and how to follow rules and manipulate the situation, young school-age children reap benefit from instruction in strategies.

Adult-child collaboration is beneficial because adults tend to provide explanations, demonstrations or examples, and guidance matched to the child's learning needs (e.g., Gómez & Rogoff, 1998). Peer interaction, in the form of training, discussion, or joint problem solving, offers different opportunities for learning because peers can define and structure a problem in a way that is accessible to a child learner (Elia & Gauvrit, 1992). Peer interaction can also promote discussion that can promote novel exploration of a problem. At certain ages, particular forms of peer interaction may be more beneficial than others. Learning by observing peers seems especially useful for very young children, but as children get older and gain awareness of others, they may find it easier to share ideas in a more structured way (e.g., Rehrmann, 2002).

Children's experiences in solving problems with supportive partners before they enter school can ease the transition to school. For example, Nettel and Srégé (2003) found that the cognitive support that mothers provided for children's learning before they entered kindergarten was related to children's self-regulation and metacognitive awareness of their thinking and performance, monitoring of progress on coursework, and seeking help when needed. In a similar vein, adult-child problem solving before children enter school can provide children with introduction to and experience with the types of problems that are the focus of school learning, such as mathematics (Sone, Guberman, & Gerhardt, 1987), and with social skills that are important to learning, such as how to coordinate behaviors during collaboration (Gauvrit, 2001).

At the elementary and secondary school levels, children's learning can be aided by collaborating with peers (Light & Littke, 1999). This research has focused on collaborative problem solving in the classroom in several domains, including mathematics and science, in the context of a computer game. Consistent with sociocultural theory, findings have supported the view that learning emerges from the joint construction of understanding through social processes such as discussion, argumentation, and negotiation. Even when classroom situations are not set up as collaborator pairs, children often solicit social support for learning and are active in seeking this type of assistance (Karaubuc & Newman, 2000).

Cultural knowledge is implicit in joint problem solving. When people solve problems together, they transmit cultural values about the type of thinking in which they are engaged, including the types of problems that are considered worth solving in the culture (e.g., "it is important for you to know this"), that some ways of solving a problem are more valid than others (e.g., "this is the best way to do this"), the type of problem that an activity represents (e.g., "this is a math problem"), whether solving a particular problem is viewed as easy or difficult (e.g., "This is going to be hard to do"), and who in the culture is likely to solve a certain type of problem (e.g., "This is like the kind of problem that mathematicians do", Goodnow, 1990).

In summary, research on the development of attention, memory, and problem solving has supported Vygotsky's (1974/1987) view that higher-level cognitive processes are mediated by social and cultural experiences. It also resonates with activity theory by highlighting the practical and goal-directed nature of cognitive development.

Research on Informal Learning and Learning Outside of School

In every culture, many opportunities for learning and cognitive development arise as children participate in everyday activities (Serpell & Hattou, 1997). Learning situations outside of school range from highly specialized and intentional arrangements, such as apprenticeships, to more informal opportunities, such as observations and participation in everyday routines and community rituals (Berry, Pintriga, Segal, & Dusi, 2006). Even though less formal arrangements of learning are not prescribed by time, place, and curriculum, they share particular structural features (Greenfield & Lave, 1982). As cultural practices, they include a set of actions that are valued and shared by members of a group; three actions have normative expectations that extend beyond the immediate circumstance, and they are repeated (i.e., part of the regular cultural fabric; Goodnow, Miller, & Kessel, 1995).

Research on children's learning and cognitive development in and outside of school has investigated many types of activities in which children participate. Some research has examined learning in contexts that have been deliberately arranged to promote learning, such as after-school computer clubs (e.g., Cole, 2006a) and museums that encourage children to explore the displays (e.g., Gaskins, 2008; Lembard, Cowley, & Kinross, 2002). In these contexts, learning is child centered in that the child's involvement is determined by his or her own interests and competencies. Thus, unlike school, children have substantial control over the pace, manner, and direction of their learning.

Social interaction is often integral to these activities. For instance, the Fifth Dimension, an after-school computer club based on the sociocultural approach, emphasizes adult-child and peer interaction as children learn about computers (Cole, 2006a). Children learn about an important cultural artifact as they socialize and work with adults and peers in problem-solving situations involving technology. In a similar fashion, children's experiences with parents and other adults in science museums that promote active exploration of displays can provide opportunities to learn about literacy and science (Callahan & Braswell, 2006). Social processes at different stages of learning have also been revealed in investigations of the teaching of particular cultural skills in apprenticeships. For instance, Tarrow (1994) observed boys learning how to weave in the Disolva community in Costa Rica. Consistent with Vygotsky's (1934/1978) notion of the ZPD, there was careful scaffolding in the beginning stages of learning to weave, such as setting up the loom, working with the threads, and learning the traditional patterns, and less scaffolding once a youth had mastered the basics of weaving.

Informal learning also occurs as children partake in authentic activities, goal-directed units of life whose primary purpose is not to instruct a child but to carry out the activity itself. Children learn in the context of authentic activities by participating alongside other cultural members who are engaged in the activities. This process of learning has been called legitimate peripheral participation (Lave & Wenger, 1991), which highlights that the learner is allowed to have sustained but nonintrusive contact with a person who is engaged in an activity. Adults make their actions available to children, and children learn by observing mature community members carry out activities.

Informal learning is not a passive act on the part of the child. Children purposefully allocate their attention with the aim of learning about the activity, which Rogoff, Paradeis, Arai, Corea-Chavez, and Angellina (2003) called intent participation. The child's efforts might include listening in on the conversations of more experienced individuals, asking questions about their behaviors, or shadowing or mimicking the behaviors that are observed. With increasing age, children's skills and interests change, and the nature of their participation in informal cultural activities, and the expectations and responsibilities pertaining to their participation, change accordingly (B. Whiting & Edwards, 1988). Adults may support children's involvement and learning in these activities through the process of guided participation (Rogoff, 1990), in which the child is a full participant, albeit one whose participation is defined and constrained by the child's capabilities and prior experience with the activity. Even children as young as 2 to 3 years of age in some communities, such as the L'inx tribes of the Congo and Mayan children in rural Guatemala, have experience in an authentic but limited fashion with the work activities of adults in the community (Rogoff, Deloache, & Angellina, 2003).

There are cultural variations in the everyday activities in which children are involved. In developing countries, children spend much of the day in and around the home and local community, and much learning occurs in these settings (Schleismann, Cama- bray, & Ceci, 1997). For instance, research conducted in Papua New Guinea and Brazil has shown that
children learn about mathematics, such as measurement (Saxe, 1991) and other forms of cognition (Nunes, 1993), as they participate in everyday activities. In contrast, in the United States, children are in school most of the day and tend to be excluded from the mature social and economic activities of their community. The primary exception to this pattern is domestic activity, which is common for children around the world, although the extent of children's involvement in and responsibility for domestic activities varies considerably (Goodnow, 1988).

Activity setting analysis has shown that within cultures, children's participation in settings of infantile learning are not homogeneous. Observations conducted in Brazil, Kenya, and the United States revealed that young children in each country regularly played, had lessons, and worked (Tudge et al., 2000). However, within these countries, children's participation differed markedly. In Kenya, children from working-class families worked more than did children from middle-class families, whose work patterns did not differ from middle-class children in Brazil and the United States. Poorer children in Brazil and the United States had fewer daily lessons than did middle-class children in these countries. This pattern was not found in Kenya, where even poor children received regular lessons about certain topics, such as nature and safety. This finding suggests that naturalistic observations within and across cultures regarding children's everyday activities will advance understanding of how sociocultural contexts contribute to development (Lancy, 2000).

In summary, informal learning in the context of cultural activities and practices contribute to learning and cognitive development in significant ways. When children participate in informal learning, the regular behaviors of the culture, and the thinking and values that coincide with these behaviors, become part of the child's own psychological makeup. The fact that these activities and practices are important to the community enhances the meaning and consequences of children's participation in them.

Research on Learning in the Classroom

A number of innovative classroom approaches based on principles of sociocultural theory have been developed to promote children's learning in formal settings. These approaches incorporate processes of social interaction and activity that have been identified in laboratory research as ways of enhancing children's engagement and achievement in the classroom. These approaches draw on many of the findings of sociocultural research, particularly the idea that children benefit when learning occurs in a social setting that provides opportunity for children to externalize and internalize their developing knowledge as well as be exposed to the ideas of others. Social processes such as peer collaboration, student discourse, and scaffolded learning involving children and more experienced partners or knowledge represented via technology have been of particular focus in the learning sciences, an interdisciplinary field that studies teaching and learning (Sawyer, 2006).

There have also been efforts to design school learning environments that model the key elements of sociocultural theory in a comprehensive fashion. To illustrate the contribution of these efforts to educational practice, we concentrate on some of these efforts. The first group consists of programs that use children's play as a teaching device in early childhood education and includes the tools of the mind approach (Bodrova & Leong, 2007), playworld practice (Bruner, Frith, & Leeuws, 2005), and the University of Illinois in Chicago's social constructivist approach (Combs, Main, & Abel, 2009). The second group consists of programs that create a community of learners in which participants engage in a joint effort to advance children's understanding and skill (Brown, Metta, & Campione, 1996; Leu & Wesser, 1991; Roesel, Turkman, & Bartlett, 2003).

Play as the curriculum. Play occurs throughout life, and educators and developmental theorists are interested in its role throughout the life span (Gonick & Perone, 2005; Hoffman, 2009; John-Steiner, Carney, & Martinez-Kalinowski, 2010). In fact, concern about the importance of play in childhood has grown in recent years. With greater emphasis on high-stakes testing, there has been an increasing tendency to curtail children's playtime, even for very young children, in U.S. schools. Recent efforts to guard against this shift have focused on the role of play as a beneficial activity for learning and cognitive development for children.

One effort based on sociocultural theory is the Tools of the Mind curriculum, which aims to enhance children's readiness for school by supporting the development and internalization of cognitive tools for learning (Bodrova & Leong, 2007). In this curriculum, socially mediated learning activities are used to help young children develop cognitive skills such as attention, memory, and problem-solving strategies. Also included are activities that help make children more aware of their own learning activities, such as self-talk, which follows up ideas introduced by Vygotsky in his research on self-regulatory private speech. Many of the activities in the curriculum involve pretend play that encourages the use of sociocultural and cognitive skills. Because the activities are designed so that children with varying levels of skill can engage in them, children develop new skills by participating in these activities alongside others who model more advanced skills. Research examining the contributions of this curriculum to school readiness has concentrated on executive function skills, such as control of attention and working memory, that are important for academic success and reported that the Tools of the Mind curriculum promotes the development of these skills (Diamond, Berset, Thomas, & Mauro, 2007).

In response to the use of adult guidance in the introduction and play of a curriculum form in the Tools of the Mind curriculum, Gneeden and Gashers (2011) discussed that such engagement with children in playful interactions is seen as a helpful practice in the Western world. However, adults' playful interactions with children are not the same kind of play as that which occurs among children alone. In our view, this form of engaged planning for adult-child play is not what Vygotsky meant when he focused on pretend play that grows naturally out of children. For him, it seems that the ZPD that emerges in play is created by the inherent demands from within the play itself and not by the guidance of others from outside the frame of play—that is, unless the adults can become genuine play partners. Consequently, the adult's contributions in the Tools of the Mind curriculum may derive from the scaffolding they provide in their playful interactions with children rather than originating from the play itself.

The role of adults as potentially genuine play partners has been introduced in another educational approach called playworld practice. This approach originated in Sweden and has recently made its way to the United States. According to Forboli and Leeuws (2010), three features characterize playworld practice. Teachers participate with children in play by temporarily stepping outside of their positions of status and power, the teachers and children organize the play environment together, and the pretend schemes that constitute the play activity are drawn from children's literature and reflect dilemmas of life that are of interest to both children and teachers. Research examining the effectiveness of this program has shown that children who engage in a story in playworld practice improve more in their narrative skills than those who only listen to and discuss the same story when read by the teacher (Baume et al., 2005).

The third approach that honors children's play as a context for learning and cognitive development is a teacher education program in early childhood education at the University of Illinois at Chicago. As described in a number of papers (e.g., Gonick, Abel, & Boshans, 2010; Gonick et al., 2009), this program, inspired by Vygotsky's ideas, provides learning opportunities through children's spontaneous play that emerge from their own peer interactions. The underlying motive for this program is that play is seen as children's right, and therefore, not providing opportunities for play would be an unfair practice, an essence depriving children of their rights. Free play with peers is an occasion for children to create a ZPD in negotiation of their symbolized personal experiences with one another. As a result, play with peers offers children the opportunity to develop a sense of community that supports their cognitive, social, and affective development.

At the University of Illinois at Chicago, teacher guidance is conceptualized as supporting the development of a community in the classrooms by providing a safe and secure context that supports children's interests. Such guidance requires teachers to shift their roles and communicative strategies from being companions to children in resuming...
The aim is that, over time and with practice that is encouraged and supported in the social context, children will adopt the discourse, belief systems, values, and goals of scientific practice. These new skills are further enhanced because the resulting knowledge is shared across the learning community.

One central component of the community of learners approach is that children learn new knowledge created through dialogue, shared understanding, and the negotiation of meaning. This setting promotes scientific thinking because processes central to science, such as speculation, hypothesis generation, and the accumulation and evaluation of evidence, are instrumental to learning. Thus, as learners in the community discuss how to proceed and evaluate and advance their knowledge, they appropriate new ideas and understanding about science and the world, which is the focus of the scientific lesson. Although this approach has been criticized for relying on a view of science that reflects the traditional school curriculum as opposed to forms of systematic learning that emerge in children's everyday experiences (Benley, 1998), one of its major goals is to enhance science learning in children who are at risk for academic failure. Competence in subjects such as mathematics and science can significantly enhance these students' chances of academic success.

Several other educational approaches are based on Vygotsky's ideas of communication and participation to support children's learning. Rogoff and colleagues (2001) introduced the concept of a learning community as they examined the activities in an open classroom in a public elementary school in which parents, teachers, and children work collaboratively to promote children's learning. This approach emphasizes the social nature of knowledge and the role of the culture in learning that occurred engagement and motivation in mathematics learning. That is, what is the role of the child and how does the child learn? For instance, teachers, parents, and children plan the class lessons together. As participants engage in the learning community, they understand new or acquire deeper understanding of learning changes. Students participate in the learning community as an active, engaged, and constructivist approach to learning the classroom. As participants engage in the learning community, they understand new or acquire deeper understanding of learning changes. Students participate in the learning community as an active, engaged, and constructivist approach to learning the classroom.


