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Vygotskij's Theory of Human Development and New Approaches to Education

Vygotskij's legacy is in his emphasis on social, historical, and cultural aspects of development and learning, semiotic mediation, activity, and social interaction. After about 50 'dark years' of silence, from the early 1930s (immediately after his death) to the end of the 1970s, caused in part by the repressive political circumstances in the USSR, social sciences have been experiencing Vygotskij's renaissance. Since the 1970s, Vygotskij has become a 'root theoretician' for a family of approaches in social sciences including sociolinguistics, anthropology, psychology, education, and literacy studies, among others. In fact, it is probably not an overgeneralization to say that developmental psychology and education have currently been highly influenced by Vygotskij's work. This article will describe the main tenets of Vygotskij's theory of human development, current critique of these tenets, and new approaches to education stemming from a dialog with Vygotskij's work. The article is organized around three major interrelated issues: what develops, what are the processes of development, and what are the directions of development.

1. What Develops?

Vygotskij argued that human development is based on the intertwining of two lines: natural, based on processes of biological maturation, and cultural, based on mastery and use of cultural means. Psychologically, these two lines are represented by lower and higher mental functions, respectively, such as memory, attention, and intelligence. For example, mechanical memorization of unrelated bits of information mainly involves lower functions of memory. Meanwhile, memorization that is based on mental structuring of information in some hierarchical classes (e.g., ax, saw, and hammer are tools) or a story connecting items to remember involves higher mental functions of memory. Vygotskij insisted that higher mental functions

are formed by a reorganization of lower mental functions mediated by a cultural sign (e.g., mnemonics). Higher mental functions allow people to control their behavior: 'in the elementary form [of memory], something is remembered; in the higher form, humans remember something ... the basic characteristic of human behavior in general is that humans persoiially influence their relations with the environment and through that environment personally change their behavior, subjugating it to their control' (Vygotskij 1978, p. 51). Thus, according to Vygotskij, what develops is higher mental functions via a mastery of cultural signs (i.e., semiotic mediation), leading to a person's development of self-regulation and self-control.

Probably the most elaborate application of Vygotskij's stress on cultural mediation as the object of development has been in the 'sign' pedagogy developed by Russian educational psychologist Davydov (1986). Davydov and his colleagues rewrote an entire elementary school curricula (e.g., math, sciences, language) representing it as a series of dialectical contradictions of mental actions mediated by cultural signs (Davydov's unit of analysis). They also changed the curriculum sequence putting the abstract concepts — higher-level cultural mediators — ahead of concrete application of them (e.g., putting study of fraction and algebra ahead of integer arithmetic). For example, according to Davydov (1986), the fraction represents the contradiction between the permanence of the object's length and the variability of its measurement, depending on the unit mediating the measurement. The mathematical formula $A/c = N$ is a model of the fraction that allows first grade students to make comparisons involving any measurement unit.

Yet a growing literature has implicitly or explicitly criticized Vygotskij for making mental functions the object of development (Rogoff 1990). These scholars have argued that culturally mediated functions are not self-contained, but instead embedded in sociocultural activities. Lave (1988), introducing the notion of 'situated cognition' demonstrates, for example, that people's computation in school-like math tasks and grocery shopping is not psychologically equal even when the problems are mathematically isomorphic. The problem solving is mediated and structured differently in these two conditions because the problems are embedded in different sociocultural activities with different goals and different social relations. In response to these and other related findings, alternative objects of development have been proposed.

Rogoff (1990) proposes a sociocultural approach in which a person's participation in sociocultural activities and communities is the object of development. Development is seen as transformation of participation in a sociocultural activity — transformation that is socially valuable. For example, when a child whose parents had previously read books to her starts asking her parents to read a book, this change indicates a

transformation of the child's participatioii in the reading practice. Some have argued that mediation by cultural tools and scripts pointed by Vygotskij is oiily **a** part of the developmental story and should be considered together with aspects such as social relations, division of labor, community rules and norms, and relations with other practices aiid communities (Engestrom et al. 1999). These features of social life were often ignored in cultural research and research on child development conducted by Vygotskij aiid his colleagues (Vygotskij 1978).

2. *What are the Processes of Development?*

According to Vygotskij's general genetic law of cultural development, any function in the child's cultural development appears on three planes: natural, social, and psychological. Vygotskij emphasized a dynamic and emergent character of development: Each plane emerges on the periphery ('in an embryonic state') of the previous plane. First, it appears on the iiatural plane, when children find themselves in the environment when the functioii is used by other people. For example, in human society, people use gestures in their communication with each other and they often are inclined to interpret some of a child's actions as gestures. When a very young child tries uiisuccessfully to grasp a remote object, the caregiver may interpret it as a commaiid gesture to bring the object to the child.

The second plane of development is social: the child is *an* active participant in the function socially distributed among people. Continuing Vygotskij's example of the development of the index gesture, at some point young children notice that they can control adults by stretching their arm toward a desired object — the adults often bring the remote object to the child. Thus, on the social plane, children actively participate in the social function of controlling other people rather than finding themselves in the function fully organized by other people as it was on the iiatural plane. Finally, on the third plane, the function transforms from external social into internal psychological. The child's commaiid of others transforms into the index gesture controlling the child's own attention. Now the stretched arm controls not others but the child him or herself, whose own attention is mediated by the index gesture. The developmeiital cycle is completed: the cultural higher mental function of the index gesture that initially exists only outside the child on the iiatural plane becomes the child's own on the psychological plane (Vygotskij 1983). According *to* Vygotskij, development involves nonlinear and systemic processes of changing relationships and organizations of mental functions.

The issue of the relationship between development and education led Vygotskij to introduce the notion of 'the zone of proximal development' (ZPD) as the gap between actual aiid potential development (Vygotskij

1978). Vygotskij offered two major interpretations of ZPD. The first interpretation is the ZPD as **a** gap between the psychological (i.e., completed) plane of development, i.e., what children can do by themselves, and the social (i.e., potential) plane, i.e., what they can do with the help of more capable others (adults or peers).

This use of ZPD defines 'teachability' of the child in a specific activity or in problem solving. If an activity or problem can be accomplished by the child with the help of more capable others, this activity or skill is considered possible to teach the child. If, however, the activity or skill cannot be accomplished by the child with the help of more capable others, it is considered not useful to teach to the child.

Unlike Piaget, who believed that instruction should follow development, Vygotskij argued that guidance can, should, and does lead development. They would differently define what is currently called 'developmentally appropriate curriculum.' Piaget insisted that learning is essentially an individual endeavor and that adults can oiily facilitate by providing an enriched stimulating learning environment aiid opportunities for children to share and discuss their egocentric thinking with each other to promote disequilibrium in the child's thinking. Adults should not interfere in the child's individual thinking because it can only lead to imposition of the adult's ideas onto the child — what Piaget called 'sociocentrisrn.' In contrast, Vygotskij encouraged adults to provide guidance aiid help and to engage students in activities that are beyond their individual levels of competence ('performance before competence,' Cazdeii 1992).

Currently there are attempts in education to develop 'scientific instructioii' using a medical model of 'educational interventions' (Pease-Alvarez C, personal communication, 19 July 1999). The essence of these efforts is to develop educational diagnostics of students' skill deficits and prescribe an appropriate dose of standardized guidance providing no less and more help to the student than is required (Newman ct al. 1989). For that purpose, some researchers have tried to develop a 'ZPD test' — a standardized assessment of a student's teachability. However, it is doubtful that a reliable ZPD test could be developed because, as Newman et al. (1989) demonstrate, the notion of ZPD is relational. A student's teachability depends not only on the student but also on the teacher (and broader communities in which the child participates). Thus, no test of the child alone would accurately determine the child's teachability—the teacher always counts.

According to this neo-Vygotskiaii view, the ZPD is applied not only to the student but also to the teacher. Both the teacher and the student try to manage the uncertainty that their joint activity creates. During teacher–student instructional interaction, the student learns how to do the classroom activity while the teacher learns how to guide the student. Each engages in their own zones of proximal development, which are

mutually coiistituted by each other—the student's learning is shaped by the teacher's guidance, while the teacher's guidance is shaped by the student's oiigoiiig learning.

The second interpretation of the ZPD offered by Vygotskij is about the activity in which the child is involved. Vygotskij argued that at different ages, different activities become leading forces in a child's development. For young children, play is the leading activity:

> play creates a zone of proximal development of the child. In play a child always behaves beyond his average age, above his daily behavior ... As in the magnifying glass, play contains all developmental tendencies in a condensed form and is itself a major source of development ... Action in the imaginative sphere, in an imaginary situation, the creation of voluntary intentions, and the formation of real-life plans and volitional motives—all appear in play and make it the highest level of preschool development. (Vygotskij 1978, p. 102)

He introduced the notion of 'leading activity' as an activity that determines the child's development. El'konin and Leont'ev elaborated this notion by creating a scale of leading activities from infancy to adulthood as the base of age periodizatioii (Griffin and Cole 1984).

Bruiier and his colleagues developed the didactic notion of 'scaffolding' in their attempts to operationalize Vygotskij's ZPD in their study of dyadic interactions involving adults tutoring children (Wood et al. 1976). Scaffolding involves a series of adult stratcgics that assume responsibility for children's learning, such as focusing the child on the task, simplifying the task to fit the child's current mastery, niaintaining the child's motivation working on the task, managing the child's level of frustration aiid risk involvcd in the problem solving, aiid demonstrating an idealized version of the required act (Rogoff 1990). Like Vygotskij's ZPD, the scaffolding metaphor is aimed at explaining the gaining of skills in social interaction that the child may apply later oii when working alone. It focuses on how the adult fine-tunes the extent of help he or she provides the child for each successful activity outcome while viewing the child as inept, 'One sets the game, provides a scaffold to assure that the child's ineptitudes can be rescued or rectified by appropriate interaction, aiid then removes the scaffold part by part as the reciprocal structure can stand on its own' (Bruner 1983, p. 60).

In a critique of the concept of scaffolding, Griffin and Cole (1984) emphasize the role of the child in his or her own development, 'The metaphor [of scaffolding] becomes more problematic when we focus not oii the execution of a specific task but oii the changes in the child' (p. 47). This concept makes it difficult to address the issue of the child's creativity. If adult support is the universal source of a child's development, 'then there is a strong sense of theology—children's development is circumscribed by adults'

achieved wisdom' (p. 47). If Vygotskij's concept of ZPD seems to be too focused on the child, then the concept of scaffolding seems to be too focused on the role of the adult in guidance. **As** a consequence, both concepts are limited by dyadic interaction between more aiid less knowledgeable partners. Besides, cross-cultural research on guidance suggests that scaffolding is not universal guidance strategy (Rogoff 1990).

Unlike scaffolding, the concept of guided participation developed by Rogoff (1990) can be applied in diverse cultural activities because it focuses oii transformation of participation guided not only by more knowledgeable partners but also by sociocultural tools, culturally defined goals aiid problems, and social arrangements of joint activity:

> Interaction with other people assists children in their development by guiding their participation in relevant activities, helping them adapt their understanding to new situations, structuring their problem-solving attempts, and assisting them in assuming responsibility for managing problem solving. This guidance of development includes tacit and intuitive forms of communication and distal arrangements of children's learning environments; it is often not designed for the instruction of children and may not involve contact or conversation. The model is one of routine arrangements aiid engagements that guide children's increasingly skilled and appropriate participation in the daily activities valued in their culture (Rogoff 1990, p. 191).

Lave insists that learning is inherent to activity and an aspect of any activity. Learning occurs even despite expectations and wills of experienced members of the community—it is not a matter of whether students learn in school but a matter of what they learn. The students might actually learn what they were not expected to learn and might not learn what was expected for them to learn. Learning is not **an** independent activity among other activities but, like development, it is all aspect of any activity **in** the world.

Lave and Wenger (1991) argue that learning is situated in communities of practice. Learning is always a question about membership in the community, about participation in the community practice. **A** novice is not simply a person who lacks some entities called 'skills,' but rather a newcomer who needs to negotiate her or his participation in the community practice. **A** person engages in ongoing negotiation of membership/participation in different communities of practice. Learning, as a process of liegotiation and renegotiation of participation in the community of practice, is often not prime-time community business; it is going on in the periphery of community activity. Because the community is aware of newcomers, the peripheral processes of negotiation and renegotiation of participation have a legitimate character. Newcomers are anticipated aiid usually organized by the community. **An** analysis of situated learning allows Lave and Wenger to construct a new productive concept of 'legitimate peripheral parti-

cipation' that becomes the main definition of learning and development.

Learning as a commuiial process is both a descriptive and guiding approach. A view of learning as communal processes embedded in communal practices has inspired many educational practitioners aiid researchers to explore and define new forms of guidance that can be used in schools, such as instructional conversations, reciprocal teaching, cognitive apprenticeship, community of learners, practice and problem-based learning, building a professional community, and dialogic inquiry. This family of instructional approaches and models shares at least the following important principles: Learning is a communal process, learning is embedded in activities and practices in which it occurs, learning involves development and negotiation of new commuiial identities, students' guided initiation of discourse and definition of problems arid goals are crucial for becoming an active member of a community of practice, ownership for guidance and learning should be shared among students and between the students and the teacher, and a community is based on practice and communication. Nonschool sociocultural research on learning shares many of the same principles.

3. What is the Direction of Development?

According to Vygotskij, development leads toward a build-up of higher mental functions with mediated cognition increasingly playing the central role among all other psychological functions that promote self-regulation in the individual. Vygotskij's primary focus in his sociohistorical theory of development was on how human society reproduces itself. Vygotskij often saw non-Western cultures as 'historical slices' of the development of Western civilization (Luria 1976, Vygotskij et al. 1993). When the developmental directionality was considered, Vygotskij was, at least, inconsistent with his own tenet that stressed the contextual and activity specificity of intellectual functioning (Cole 1988). Prioritizing self-regulation, mastery of independent working, literacy, schooling, scientific concepts, universal rationality, decontextualization, and systematic hierarchical thinking as the pinnacle of individual's development reveal Vygotskij's ethnocentrism (Rogoff 1990, Wertsch 1985).

A diversity of goals of different communities necessitates defining development in terms of progress toward more responsible participation in specific communities of practice rather than assuming that development is a generic process independent of the goals aiid institutions of the communities in which an individual develops. As Tharp and Gallimore (1988, p. 31) report, 'Boys in Micronesia, where sailing a canoe is a fundamental skill, will have a ZPD for the skills of navigation, created in interaction with the sailing masters. A girl in the Navajo weaving community will have experiences in a zone not quite like any ever encountered by the daughters of Philadelphia.' At the same time, the developing individual contributes to the further development of the practices (and goals and institutions) of the community.

Griffin and Cole (1984) argue that the zone of proximal development is not just about a gap between the child's present and the adult's past but also between the child's present and the society's future. There is an increasing tendency in the social sciences to consider the developmental telos as a social construction of cultural, institutional, communal, and personal values that have both stable and dynamic components that can conflict with each other. The historical time when positive values of literacy, school, science, rationality, intelligence, and the Western civilization were unquestionable in the social sciences is gone. Stemming from Vygotskij's sociohistorical theory, new approaches to development and learning are emerging.

See also: Cognitive Development: Child Education; Cognitive Development in Childhood and Adolescence; Human Development, Bioecological Theory of; Piaget's Theory of Human Development and Education; Situated Cognition: Contemporary Developments; Situated Cognition: Origins; Vygotskij, Lev Semenovic (1896–1934)

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