

Vygotsky's Socio-Cultural Theory of Cognitive Development

A basic assumption of cognitive development is that individuals create new knowledge in their goal-directed activities; in turn, new knowledge leads subjects to identify new goals. Empirical research on culture and cognitive development has been influenced by two constructivist treatments which differ in their description of the role of social processes in the development of the individual's self-regulative autonomous reasoning. One treatment is associated with the structural developmental approach of Piaget, and the other is associated with the socio-historical approach of Vygotsky.

Vygotsky, whose psychological writings have epistemological background in the works of Marx and Hegel, outlined a specifically socio-historical approach to cognitive development. For Vygotsky, the central problem was to understand how infants, who are initially impulsive, responding directly to environmental stimulation, gain control over interactions with their environments. For Vygotsky, the emergence of spoken language among children – one of various sign using activities – is at the heart of the interplay between natural and socio-historical processes of the individual's development (Hippisley 2001). Vygotsky argued that thought and speech have separate roots: there is a preintellectual phase in speech development and a preverbal phase in the development of thought. In early childhood, these processes begin to penetrate one another; the child uses telegraphic speech first to accompany problem solving, and gradually uses speech to help solving and then planning solutions to problems. Eventually, we see the telegraphic or 'egocentric' speech of toddler-hood gradually go 'underground, transforming into covert inner speech' (Cardwell, et al. 2000, p. 26). Thus, what was once a social artifact external to the child is gradually transformed by the child, first into an external aid which helps to

organize problem solving and later into a core ingredient of conscious thought (Klecker 2003). Vygotsky stated that 'first culture affects learning, as children learn through interactions and cooperation with others and the environment, and second the child develops through the symbolic representations of the child's culture' (Oakley 2004, p. 34).

For Vygotsky, speech was one of the varieties of cultural sign forms that displayed a complex transformation on its inward trajectory. Vygotsky's analysis of sign form use in emergence of mediated or 'voluntary' memory presents an interesting parallel. In one study, Vygotsky's purpose was to show that, as in the case of speech, the functional relation of the sign form to basic intellectual processes shifts with the inward movement (Klecker 2003). Sign forms begin as merely juxtaposed with goal-directed efforts; subsequently, they are consciously organized by the child into a part of goal-directed activities as they become external solution means; finally, they become transformed into automatic and abbreviated covert mental activities. According to Vygotsky,

Elementary mental functions are natural and unlearned behaviours, i.e. sensation. We can develop these to some extent through experience. Higher mental functions are aspects which need to be developed through learning, i.e. language and memory, thinking, paying attention etc. Inner speech is required for higher mental functions (Oakley 2004, p. 41).

To illustrate this developmental phenomenon in the case of memory, Vygotsky presented individual children with a game-like laboratory task: children were asked to answer specific questions. Many of the questions required children to respond with color names, some of which they were forbidden to say. In one condition, children were also presented with a set of auxiliary materials – color chips – that could be used as a sign form (Klecker 2003).

Children in the youngest group often found the chips as a source of added

difficulty and did not attempt to use them as a means of task solution; these children committed just as many errors on the chip and no-chip conditions (Cardwell, et al. 2000). Children in the middle age groups performed better results in the chip condition than in the no-chip condition; they constructed strategies to use the chips as a sign form to aid their memory. In the oldest age groups, performance was very good across chip and no-chip conditions (Oakley 2004). Vygotsky argued that adults had generated internal strategies akin to external chip manipulation to solve the task (Klecker 2003).

For Vygotsky, social interactions were a critical vehicle whereby natural processes in cognitive development were redirected by social and historical influences. In social interactions, Vygotsky argued, 'zones of proximal developments' are created. A zone of proximal development was defined as the difference between what a child could accomplish unassisted in problem solving and what he or she could accomplish with assistance (Brewer 2001, p. 114). Vygotsky argued that the socially supported activity in the zone of proximal development awakened and provided paths for intellectual development. In social interactions with their mothers, children achieved more sophisticated goals than they did on their own. Further, an analysis of videotapes of these interactions revealed flexibility in the ways in which the goal structure of the task emerged over the interactions (Brewer 2001). When children had difficulties, mothers tended to simplify the numerical goals of the task, and when children were doing well, mothers tended to focus on more complex numerical goals. Such adjustments were largely independent of both age and social class. Thus, in adult-child interactions, children are accomplishing goals that are at once linked to their own constructive efforts and to social life (Oakley 2004).

Most centrally, these studies do not treat cognition from a developmental

perspective, a perspective in which cognitive forms are understood as evolving in a complex psychogenetic process, shifting in function over the course of their evolution. For instance, we rarely observe individuals sampled at different ages or at different points in their acquisition of trade (Oakley 2004). Even when such a sampling procedure is used, we do not find analysis of the shifting character of cognitive forms as these forms are interwoven with shifts in people's goal-directed activities.

The zone of proximal development or ZPD is the distance between the actual developmental level and the potential level of the child. There is a contrast between the actual level, which includes processes that are already developed, and the ZPD, which includes processes/functions that are not mature yet (Oakley 2004, p. 131).

Further, because development is not a principal focus in the practice-based studies, we see little analysis of cultural processes whereby children's understandings become interwoven with the cognitive achievements and practices of their social group. Consider the situation of the child novice entering the practice of potting, weaving, or street selling (Oakley 2004). The child has little knowledge of how to participate in practice and has not structured the sometimes sophisticated cognitive forms that are required to solve conceptual problems that emerge in practice. In order to begin to participate, there must be routes that ease the conceptual burdens for the child (Casby 2003). For instance, other more experienced participants may modulate the conceptual problems which novices address, and their modulation may be akin to the zone of proximal development that has been reviewed in detail in this research (Brewer 2001).

Piaget's treatment of cognitive development is rooted in a neo-Kantian epistemology in which a principal assumption is that the world is not known directly but is assimilated by intellectual structures (Smith 2001). Piaget shared a concern to understand how the subject comes to know the necessity of propositions about

logical-mathematical and physical phenomena. The solution for both was in the properties of these cognitive structures. Piaget, however, did not share Kant's monism and took a developmental perspective (Oakley 2004). In contrast to Vygotsky, Piaget supposes that 'thinking develops in recognizable stages which are dependent upon natural maturation' (Oakley 2004, p. 142). Using empirical research, he produced evidence supporting a sequence of four stages of cognitive development that extended from infancy through adolescence. In Piaget's analysis, each successive stage constituted a new cognitive equilibrium, and for each stage Piaget's central analytic concern was to present an analysis of its structural or formal properties (Pulaski 2000). In Piaget's scheme, reality for the infant at birth is no more than the extension of its hereditary reflexes, like sucking and grasping. In the course of progressively more complex interactions with its environment, the infant transforms these hereditary reflexes into cognitive structures which make it possible, at about 18 months, for the infant to 'represent' experience, and semiotic systems (imitation, imagery, language) begin to emerge (Casby 2003, p. 43). The representational capacity carries with it, however, new problems of coordinating representations, problems which are not solved until the next stage when concrete operational classificatory and relational structures emerge in middle childhood. Concrete operational structures provide the basis for a wide range of novel and stable concepts like quantity conservations (Pulaski 2000). It is not until early adolescence that the individual constructs an integration of concrete operational class and relational operations into a system of formal operations which is the basis for deductive reasoning (Oakley 2004).

To explain progress through its stages, Piaget, like Cassirer, argued that the subject is purposeful, constructing goals based on prior knowledge and creating

coherent solutions to these goals in the form of novel cognitive developments. In Piaget's treatment of equilibration, the interplay between social life and cognitive developmental processes was not a core concern. Indeed, for Piaget, the focus was on the formal properties of action without regard for the succession of actions in a socio-historically articulated web of meanings (Oakley 2004). Nonetheless, questions of social influences on cognitive development have emerged in works of various researchers who have attempted to extend Piaget's analyses to social processes, and Piaget himself has noted the effect of social processes on the rate of progress through his stages. However, critics and educators find in these extensions that social life is related to cognitive development as an external process. The fact that sociocultural life may be deeply interwoven with the character of intellectual functioning still needs more research to be conducted (Oakley 2004).

The specialized knowledge of currency documented in the prior pages includes knowledge of the numerical names of different bill values (nominal forms), knowledge of the ordering of named pairs (ordinal forms), and knowledge of multiplicative relations between named pairs (multiplicative forms). The representative functions are analogously varied. These include a nominal one involving the use of names (or tokens) to refer to numerical values, an ordinal one involving the transformation of names or tokens into order relations, and a multiplicative one involving the transformation of ordered names into many-to-one equivalences, equivalences that define the denominational structure of the currency system (Oakley 2004, Harland 2003). In school, for instance, children learn our standard number orthography and computational procedures that have been worked up over a complex cultural history; these are specialized forms that can be applied to any computational problem. In contrast, in everyday practices, cognitive forms are

typically more restricted – they are constructed to accomplish particular goals in daily activities (Cardwell, et al., 2000). Children participate in a multiplicity of practices in which specific practice-linked cognitive problems arise, both in school and out. It may very well be that children make use of cognitive forms constructed in one context to address problems that emerge in others (Casby 2003). The focus here is on the way practice participants may appropriate school-linked knowledge forms to address practice-linked problems and, reciprocally, the way children in school may appropriate practice linked cognitive forms to address school-linked problems.

On the whole, Vygotsky's Socio-Cultural Theory of Development is based on three main components: culture, language and the zone of proximal development. An analysis of such processes would be critical both to a treatment of the actual goals that children of different ages or levels of expertise are addressing in a cultural practice, and to understanding of how cognitive forms of the individual become interwoven with those of the larger social group.

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