BOOK REVIEWS

Introducing Vygotsky: A Guide to Practitioners and Students in Early Years Education. Sandra Smidt. London & New York: Routledge (www.routledge.com). 2009, 192 pp., $33.95 (softcover)

Sandra Smidt's intention was to make Vygotsky's ideas comprehensible for a wider audience of educators. She starts with a claim that his work is “difficult to understand, partly because we only have access to it in translation and partly because it is full of wonderful ideas and theories which are difficult to unpack because they are written in a dense and academic language” (p. ix). To facilitate the task of “unpacking,” Smidt organizes her book as a sequence of short chapters, each one ending with a “Looking Back, Looking Ahead” section that serves as a summary and an advance organizer, followed by a rather lengthy glossary that includes key terms, their meanings, and their significance. There is nothing wrong with such an organization in itself, but as I will show later, sometimes definitions and interpretations given in glossaries actually detract from the value of explanations given in corresponding chapters.

What is attractive in any popularization work is that it presents rather complex and often still controversial ideas in a simplified way, giving a reader a pleasant feeling that by finishing this one book he or she becomes, if not an expert, at least knowledgeable about a given theory. In this sense, Smidt's book accomplishes the popularization task pretty well. The reader closes the book having been enriched by a complete vocabulary of Vygotskian and neo-Vygotskian terms such as “sociohistorical,” “cultural tools,” “mediation,” “inter- and intrapsychological,” “leading activity,” “scaffolding,” and so on. An important tool of popularization is everyday examples that flesh out more abstract ideas. In this respect, Smidt also used for the most part attractive vignettes to help readers decode the underlying concepts. For example, in order to explain how mediation via cultural tools shapes our remembering she writes:

Martha is about to go to the supermarket. She has a lot to buy and she makes herself a list to ensure that she remembers everything. (p. 23)

The job of popularization, however, is perilous because the very operations of simplification and selection that allow the work to become popular carry in themselves a danger of distortion and obfuscation. Let us look at the example about Martha's shopping. In a more academic text, this vignette would probably be followed by a rather lengthy discussion of the differences between literate cultures that shift the burden of memorization to that of cataloguing and reading and nonliterate cultures that use a variety of mnemonic techniques for achieving the same goal. Moreover, the students of Vygotskian theory would probably also
discuss the question of the extent to which the use of written notations changes the entire structure of human memory, or that such a mediated memory remains contextual and situated without affecting other topics and situations. In the absence of such elaborations, one can never be sure whether the reader will actually grasp the meeting of culturally mediated action as opposed, for example, to a simple retrieval of information from the shopping list.

Because vignettes are by necessity rather short, there is always a danger that the reader would not receive enough material to judge the true intention of the author. While discussing everyday and scientific concepts, Smidt refers to a study of Jane and Robbins (2004), which showed how scientific concepts are acquired by children in their everyday interaction with grandparents.

Oliver on the beach wanted to know why there were bits of glass that were really smooth and asked, Granddad, where does the sea go when the tide goes out. (Smidt, p. 67)

In the absence of further discussion the reader would never know whether the grandfather was able to explain to Oliver the role of the moon in the phenomenon of the tides, or the abrasive qualities of the sand that smoothed the pieces of glass. What is more important, the brevity of this vignette leaves the reader no other option than to simply trust the author that the grandfather provided the child with the scientific concept rather than just enriching his everyday understanding. Being curious, I decided to check the quoted work of Jane and Robin. To my great surprise, their text contained no story about Oliver and his grandfather on the beach. Most probably, this is just a case of a printing error, but it highlights the peril of using short vignettes.

The telegraphic style of popularization reached its apex in the glossaries provided at the end of each chapter. Consider the following examples: “Consciousness—Consciousness means awareness of something” and “Agency—Agency refers to the ability and need for learners to be in control of their own learning” (p. 17). One wonders whether the above gloss of consciousness is necessary and whether it adds something to the general knowledge that even a less-than-prepared educator probably has. The case of agency is even more problematic. A great deal of Vygotskian research, particularly that of Wertsch, Tulviste, and Hagstrom (1993) is dedicated to the explication of the notion of agency, one of the important aspects of which is that “to be in control of one’s own learning” is a rather late outcome of a long process. The agency does not actually coincide with the individual child but involves both other individuals, such as parents and mentors, and symbolic tools provided by the culture. By focusing on the final product, Smidt, instead of unpacking this important concept, actually leads the reader to believe that Vygotsky was not different from many other psychologists who perceived agency as a self-sufficient individual.

The glossary entry “Leading activity” is supplemented by the following comment: “An interesting theory but perhaps too broad to be of practical use to us. For me it does not allow for a more detailed and sensitive approach to learning within the very broad span of schooling from early years onwards” (p. 102). The question is how to evaluate this comment, taking into account that Smidt presented neither Elkonin’s elaborations of the leading activities at the preschool, nor Davydov’s work on leading activities at different school ages (these two being the main contributions to the theory of leading activity).

As a result the present reviewer remains somewhat ambivalent in his appraisal of this book. On the one hand, it may offer a useful first encounter for the educational novices with
the basic premises of sociocultural theory; on the other hand, some of these novices would probably be better served if they started their acquaintance using more academic texts that—though more difficult—nevertheless bring a richer and more elaborate picture of one of the most exciting theories in 20th century psychology and education.

REFERENCES

Jane, B., & Robbins, J. (2004, November). Grandparents supporting children’s thinking in technology. Paper presented at the Annual Conference of the Australian Association for Research in Education, Melbourne, Australia.

Wertsch, J., Tulviste, P., & Hagstrom, F. (1993). A sociocultural approach to agency. In E. Forman, N. Minick, & C. Addison Stone (Eds.), Context for learning: Sociocultural dynamics in children’s development (pp. 336–356). New York: Oxford University Press.

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Foundations in Evolutionary Cognitive Neuroscience. Steven M. Platek and Todd K. Shackelford. New York: Cambridge University Press (www.cambridge.org). 2009, 232 pp., $55.00 (softcover)

Inclusion of the word “foundations” in the title of this book might lead one to expect an introductory text; indeed, the editors say in the preface that it is “an introduction to the emerging field of evolutionary cognitive neuroscience.” One should not assume thereby that it is a book for beginners in any of these three broad disciplines, although, in the manner of a brook, the depth varies from chapter to chapter. The contributed work is a small collection of expert and scholarly chapters representing broadly the current state of knowledge at the confluence of evolution, cognitive studies, and neuroscience. The chapters represent different perspectives and, inevitably, different domains of expertise, each with the intent of elucidating the development, in a phylogenetic sense, of important human characteristics. The fact that the book consists of only eight chapters for a total of 232 pages is perhaps an accurate reflection of the current stage of development of this confluence of major disciplines.

The initial chapter, by Goetz, Shackelford, and Platek, is truly an introduction to evolutionary psychology, which is to say, an extension of Darwinian principles of natural selection to the understanding of human behavior, especially intelligent behavior. Its general approach rests on the assumption that examination of the historical record of primate development can help one to understand contemporary human development and functioning. The authors focus on the concept of adaptations: the accumulated products of “small incremental phenotypic changes that enhance an organism’s ability to survive and reproduce (relative to competing designs)” (p. 4). This emphasis is reminiscent of Granit’s (1977) insistence that adaptation is, in both an evolutionary and ontogenic sense, less important than adaptability, but the distinction is not raised in this chapter. The chapter’s authors wax perhaps a bit too enthusiastic when they conclude that “an evolutionary psychological approach is a logical framework on which to base all psychological theories” (p. 16). The chapter is a valuable and useful primer for the budding discipline of evolutionary psychology.
In Chapter 2, Geary discusses the evolution of general fluid intelligence ($g$). He relies on the now-familiar distinction between ability that cuts across content domains (one who is good at some things tends also to be good at others), the $g$ factor, and ability that is essentially founded on acquired knowledge (crystallized intelligence). A central concept in evolution of intelligence is $EQ$, “encephalization quotient,” (brain size relative to that of another mammal of the same body weight). $EQ$ is then related to the environmental requirements and offerings to which animals and human beings have needed to respond across their evolutionary history. Geary’s psychological data are typically psychometric, with heavy reliance on tests of intelligence and the correlations among them, without due recognition of the distinction between latent (intelligence) and manifest (IQ, the score from an intelligence test) variables. Nevertheless, the chapter is a comprehensive treatment of the concept of fluid intelligence and its importance in human behavior and suggests the intimate relations among development of intelligence, growth of the brain, and environmental challenges.

Lee’s Chapter 3 follows Geary’s discussion in a logical manner, centering on a so-called general cognitive factor in the evolution of human intelligence, and it brings us closer to the everyday concerns of cognitive psychologists and proponents of cognitive education. Specifically, Lee attacks the question of domain specificity: Have human abilities in the intellective realm evolved in response to specific survival challenges and thus might be constrained to applications in the same or similar domains? He comes fairly close to distinguishing between “intelligence” and “cognition” but never quite makes it, as Haywood has done repeatedly (e.g., 2006, 2007). Such a distinction would help to clarify the domain-specific versus generalizability issue, a persistent issue in applied cognitive studies.

The sequence of chapters moves nicely from remote (the far reaches of evolutionary time) toward contemporary issues and concerns. Thus, in the next chapter Barrett discusses information processing in the context of evolutionary adaptations and domains, referring to the “form-function fit” in information processing. He seeks matches between information-to-be-processed and the evolved systems for processing that information. In the process, he continues Lee’s pursuit of domain specificity, specialization, and generalized ability. Given that evolutionary adaptations are to relatively specific environmental demands, one expects that those adaptations will ultimately serve domains of functioning that are like the circumstances that helped to bring them about. Adaptations sometimes serve a broader domain than those for which they were evolved, leading to the possibility of domain-general adaptations (as amalgams and broadening, presumably, of domain-specific adaptations).

Continuing the book’s progression toward contemporary concerns in applied cognition, Arbib discusses, in considerable detail, the origins of language in both phylogenic and ontogenic senses. In a novel approach, he employs data from new sign languages, used by deaf persons in Nicaragua and the Negev, that have appeared in the last century to shed light on the adaptive functioning and development of language itself, while sticking with the evolution paradigm. This is a useful approach that is capable of producing new insight. Community influences on development of language are considered, as well as their interactions and transactions with evolutionary adaptations.

Ardila, in Chapter 6, relates brain evolution and language development, again using an interesting approach: data gained from knowledge of language disorders, specifically the aphasias. It is interesting to see how disordered language can yield inferences about the emergence of language in the species, while data on brain evolution helps to understand ontogenic language acquisition and elaboration and its disorders.
Departing only slightly from the language emphasis of the two previous chapters, Little and Jones, in Chapter 7, discuss “The evolutionary cognitive neuropsychology of face preferences.” As in the previous chapters, the specific objects of study constitute particular investigative tools—in this case, the study of how people recognize and discriminate faces and come to establish preferences for some over others. The processing of attractiveness is considered in relation to evolutionary history, reward, and cognitive characteristics.

In the final chapter, Takahashi and Okubo consider neural correlates of jealousy and sex differences in that domain. This is the most psychologically specific chapter. It serves as an example of the value of an evolutionary cognitive approach for understanding contemporary human characteristics and functions.

As treatments of evolution inevitably do, the authors in this book get dangerously close to teleological thinking, especially when discussing the so-called purposes of adaptations to environmental demands. It is difficult to avoid this problem, and it becomes acceptable when one understands that it is only a shorthand way of expressing a very complex set of processes over a very long time. In places, they tend to assert as given certain unproven assumptions; for example, Arbib states that “Monkeys have little or no capacity for imitation . . . and apes have a capacity for simple imitation” (p. 118). In addition to various demonstrations of imitation by simians of other simians as well as human beings in simple motor acts, any assertion of lack of capacity is logically indefensible (see Rumbaugh & Washburn, 2003, for a fuller treatment of primate intelligence).

On the positive side, the book is very informative, well organized in a useful progression of chapters, and extremely well documented. Although it is difficult reading in some stretches, no reader will come away without having been challenged to think about contemporary human behavior in much larger terms.

REFERENCES

Granit, R. (1977). *The purposive brain*. Cambridge, MA: The MIT Press.

Haywood, H. C. (2006). A transactional perspective on mental retardation. In H. N. Switzky (Ed.), *Mental retardation, personality, and motivational systems: International review of research in mental retardation*, (vol. 31, pp. 289–314). New York: Elsevier/Academic Press.

Haywood, H. C. (2007). New concepts of intelligence are needed: New methods of assessment will be required. In D. Washburn (Ed.), *Primate perspectives on behavior and cognition* (pp. 125–134). Washington, DC: American Psychological Association.

Rumbaugh, D. M., & Washburn, D. A. (2003). *Intelligence of apes and other rational beings*. New Haven, CT: Yale University Press.

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*Cognitive Development: The Learning Brain*. Usha Goswami. Hove, UK: Psychology Press (www.developmentalpsychologyarena.com). 2007, 450 pp., $45.00 (softcover)

*Cognitive Development: The Learning Brain* is a thoroughly revised edition of Goswami’s book *Cognition in Children* from 1998. Although the textbook, with illustrations in color, is primarily written for teachers and students in developmental and cognitive psychology, educational science, language, and learning sciences, it is of interest to everyone who studies, teaches, or trains children or those who are being trained to do so.
What makes the book, as a textbook, special? Most books on cognitive development start with developmental theories like Piaget’s or Vygotsky’s views on the emergence of cognition and cognitive abilities in the child. In Goswami’s book, however, new developments in cognitive psychology and cognitive neuroscience form the basis of an innovative theoretical perspective on the learning brain.

The first part of the book schematizes children’s cognitive development around the three domains of naïve knowledge that humans build from early in life: naïve physics, naïve biology, and naïve psychology. The physical world is necessary to understand objects and their physical restraints (they can be moved and still exist, they can fall down, they can be manipulated, they have colors, etc.); the biological world makes them understand that there are different categories and concepts, like animate versus inanimate entities, different hierarchically ordered animals or plants, different classes including actions, events, and mental states; and by the naïve psychological world the child is able to understand human behavior and interactions between people. These three naïve knowledge fields the child is building, which Wellman and Gelman (1998) described as foundational domains for cognitive development, form the basis to understand the world. According to them, and many others since then, infants possess these three naïve knowledge frames to understand the world around them and to build up their own knowledge. Interrelated with the developmental path according to these three domains exists the development of perception, attention, learning, memory, and reasoning.

In Chapter 1 memory, perception, attention, and the visual world are presented from the physical perspective. Full object concept, working memory, memory for events and causal events, visual preference and habituation, categorization of visual information, prototypes, representation of spatial and other relations are the main concepts in this chapter, followed by cognitive neuroscience support, and most interesting is the part on the links between early cognitive functions and later intelligence, including individual differences.

Chapter 2 focuses, again from a physical perspective, not only on perceptual structure and cognition, conceptualized as “higher-level judgments or deductions based on that perceptual information” (p. 41) but also on reasoning and problem solving regarding the physical world, on learning, and on gaps in physical knowledge. Imitation, perception of causality, causal frameworks, cognitive and perceptual representations, domain-specificity or domain-generality, reasoning (about objects, events, numerical relations), and learning are key topics in this chapter. Of special interests are the parts on learning by analogy and explanation-based learning. Data from neuroscience are available, showing that the immaturity of the frontal cortex in particular seems responsible for some gaps in infants’ cognitive abilities, for example, the search error that emerges around 9 months of age.

Chapter 3 continues with the development of the psychological world by which we detect that we are able to think about our own feelings and desires but also come to know that persons in the outside world think, feel, and act in a comparable way as we do. The child develops a naïve theory of the mind. Understanding mental states, goal-directed actions, and false beliefs are followed by insights from social-cognitive neuroscience. Social interactions, self- and other awareness, goal-directed activities, and intentional actions and understanding of false beliefs are the main topics in this chapter, some of which accompanied by insights from neuroscience.

In Chapter 4, the biological world has a central position. Categorization, conceptual development, discussions on characteristic versus defining features in the representation of categories, and the role of language, representation of categorical knowledge, and the (non) existence of conceptual change are the central aspects. Superordinate levels of concepts are essential in cognitive development, and the important role of mirror neurons in this field is
described in detail. Of course, language acquisition forms a main part of cognitive development, as showed in Chapter 5. The chapter is divided, as in most textbooks, into phonological, lexical, grammatical, and pragmatical development. Cognitive neuroimaging, by fMRI and EEG studies, only very recently can be found in the literature on phonological development, for example, on the mismatch negativity even young, sleeping babies show. Neuroimaging studies showed an increased EEG response when one sound unexpectedly changes to another, as is the case and needed in phonetics and language acquisition. Children appeared to distinguish different stress patterns in language quite early and their own language stress patterns seem to have a special place in long-term memory. Lexical development appears to be closely related to concept development, and Broca’s area is related not only to the overt production of speech but also to silent rehearsal and short-term memory. Learning how to put words together goes hand in hand with word acquisition. According to Goswami, describing the work of Tomasello (2006) in this field, the set of grammatical rules that determine how words have to be combined has to be learned by the child, and this learning depends on general learning principles; most likely, reasoning by analogies forms the underlying mechanism (p. 178). As a parallel, children have to learn the pragmatics of using language, in order to be able to communicate with others, and here the social development of the child comes in.

Causal reasoning has a central position in the whole book, but especially in Chapter 6. Goswami states that causal reasoning is the domain-general skill that has a core function in cognitive development, enabling children to learn about all kinds of causal mechanisms. In the first years of life, perceptual information causes the emergent understanding of not only the physical world but also the development of social cognition and conceptual development. Children’s reasoning about causes and effects, causal chains, causal principles, and scientific reasoning, including biases and misconceptions, are core elements of this very central chapter. At the neuroscience front there are to date no studies of causal reasoning in children, probably not only because such studies are quite complex but also because causal reasoning implies coordinated working of a number of brain parts. Goswami refers to a few neuroimaging studies in adults that show that comparable brain fields are working if persons perform general reasoning, analogical reasoning, problem solving, or deductive reasoning tasks. This seems a very interesting conclusion for future cognitive training and transfer research in this field.

Other central concepts in cognitive development are social cognition, theory of mind, and mental representations. These concepts form the core of Chapter 7 but are presented elsewhere as well. Theory of mind refers to the ability to impute mental states to oneself and to others, which is necessary to predict behaviors and mental states of others. Children need to have some form of metarepresentation available before they can do so, and such a rudimentary form appears at 15 months of age. This metarepresentation ability seems of special importance in learning and education because it forms, combined with language development, the basis for, among other things, symbolic representation. To date, much research has been performed regarding a potential underlying specialized neurocognitive substrate behind theory of mind, but consensus has not been reached.

In the next chapters the development of the memory system, reasoning, metacognition, and executive functions are explained again in more detail. The development of reading and math has been outlined as well, including neuroimaging studies of reading and developmental dyslexia. Of special interest seems the development of cognitive flexibility and executive functions. Three-year-old children are cognitively rather rigid in their performances on, for example, card sorting tasks with color and shape features. They focus on one aspect of the task and stay
focused on this feature, even if the sorting rules are changed. Flexibility in shifting attention when multidimensional or conflicting information is presented and inhibition of responses to irrelevant stimuli develop, however, relatively quickly with age, at least if there are no cognitive impairments. The book gives an overview of results of cognitive neuroimaging studies that provide some evidence for the hypotheses that development of cognitive flexibility and inhibition are related to maturation of the frontal cortex and the integration of several neocortical regions with the frontal cortex. Very important in these chapters is also the development of reasoning and in particular inductive reasoning because many forms of learning require induction processes or rule detection. Based on, among others, the work of Ann Brown, it is showed that even young children are able to reason by analogy (e.g., Goswami, 1992).

To stress once again that the book is not written from the perspective of a classical theory on child development, the theories of Piaget and Vygotsky have a modest position in Chapter 11. This chapter pays attention to new theoretical frameworks of cognitive neuroscience as well. Neuroconstructivism explains cognitive change mechanisms from the viewpoint that there are biological constraints on neural activation patterns that constrict mental representations. Environmental experiences will enable the brain to develop, thereby leading to changes in mental representations. Developmental disorders can possibly be explained by altered constraints on development of the brain (Karmiloff-Smith, 2007). From this neuroconstructive point of view there are constraints on development but not on learning. Goswami stresses in the last chapter of the book that in cognitive development there is always a role for learning. Different types of learning may have different effects on brain development.

So what makes the book special? Goswami focuses on the results of many recently designed and described psychological experiments and theories concerning children’s cognition and mental representations, bringing in findings from cognitive neuroscience when available. That is not so new in itself. Stressing the three naïve knowledge frames children are supposed to possess, in combination with a focus on developing cognitive processes such as reasoning, metacognition, theory of mind, working memory, and executive functions, make the book exceptionally interesting and readable. Every scientist in cognitive development or education will find interesting and up-to-date parts of texts related to his or her field of interest. The book is on development and not on learning, so there is not much attention for training or teaching or the effectiveness of programs on cognitive development. However, it gives ample information on the development of processes behind learning and the possibilities of learning and education. The brain develops, and this has to go hand in hand with learning, which leads to development through the interaction of both—it is like a second zone of proximal development!

REFERENCES

Goswami, U. (1992). Analogical reasoning in children. Hillsdale, NJ: Lawrence Erlbaum.
Karmiloff-Smith, A. (2007). Atypical epigenesis. Developmental Science, 10, 84–88.
Tomasello, M. (2006). Acquiring linguistic constructions. In D. Kuhn & R. S. Siegler (Eds.), Handbook of child psychology (vol. 2., 6th ed., pp. 464–510). Hoboken, NJ: Wiley.
Wellman, H. M., & Gelman, S. A. (1998). Knowledge acquisition in foundational domains. In D. Kuhn & R. S. Siegler (Eds.), Handbook of child psychology (5th ed., vol. 2, pp. 523–573). New York: Wiley.

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