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BOOK REVIEWS

Vygotsky's Legacy: A Foundation for Research and Practice. Margaret Gredler and Carolyn Claytor Shields. New York: The Guilford Press (www.guilford.com). 2008, 242 pp., $38.00 (hardcover)

Key to Learning: The Technology of Child Development—Vygotskian Approach to Early Education. Galina Doyla. Wheathampstead, UK: GDH Publishing. 2007, 180 pp., $58.95 (softcover)

The two volumes in this review belong to what one may call the "third wave" of Vygotskian studies conducted outside Russia. The "first wave" that started in the 1960s included selected translations of some of Vygotsky's works and first attempts to analyze his theory and make it comprehensible for an English-speaking audience. The massive "second wave" of the 1980s and 1990s accomplished the task of translating practically all Vygotsky's and his immediate collaborators' main works and generated a wide range of interpretative and derivative studies. The "third wave" has moved from the level of translations, interpretations, and Vygotskian-based research to the level of textbooks and handbooks. To use Thomas Kuhn's term, one may say that what we currently witness is the passage of Vygotskian studies into the stage of "normal science."

The genre of *Vygotsky's Legacy* is easily identifiable. Although the authors claim that the book is intended "for all who are interested in Vygotsky's ideas" (p. viii), it is clearly a graduate textbook aimed at the growing audience of students who take courses in sociocultural psychology or cultural-historical activity theory. The book is well structured: It starts with an introduction, ends with implications, and has seven main chapters, each one focusing on a particular aspect of Vygotsky's theory. The didactic objective is further emphasized by the presence of summaries and a short glossary of Vygotskian terms appended at the end of the book.

The first part rather boldly starts with the issue of Vygotsky's research method. The authors identify the requirement to grasp the "essence" of behavioral or cognitive phenomena in the process of their formation as the central element of Vygotsky's methodology and elaborate on his critique of a typical scientific approach that analyzes already fully formed psychological entities into their constituent parts. The principles of the experimental-genetic (from genesis formation) approach were translated by Vygotsky into a concrete research methodology of so-called double stimulation. According to this methodology, an individual has to be confronted with a task that is beyond his or her natural abilities but simultaneously supplied with

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some additional material that can serve as a potential mediator between the task and the natural cognitive abilities of this person. The observation of the person's appropriation and application of this supplementary material as a cognitive tool provides a "window" into the dynamic process of the formation of higher mental processes.

Gredler and Claytor Shields summarize a number of well-known Vygotskian studies on memory, attention, and concept formation and then proceed to implications for contemporary researchers and practitioners. I would single out one of these implications as particularly laudable. The authors emphasize that researchers and practitioners alike should clearly state their basic assumptions and beliefs because the latter inevitably impact on interpretation of empirical data or choice of educational activities. This is important because many authors still relate to empirical facts as if they are naturally given, while of course they are always produced by specific research or practical activity, which in its turn is dependent on the researchers' beliefs and epistemology. If something appears to be missing in this chapter, this is a broader discussion of the relationship between Vygotsky's methodology of formative experiments and modern microgenetic methods in child psychology.

The next chapter focuses on the core thesis of Vygotsky's psychology, namely, that higher mental functions are shaped by the individual appropriation and use of signs and symbols characteristic of a given culture. The authors outline the equivalence of three conceptualizations of this process: cognitive conceptualization that emphasizes self-organization of the individual's attention, categorical perception, logical memory, and other cognitive processes; behavioral conceptualization with its emphasis on development of increasingly sophisticated use of signs/mediators for the mastery of one's own behavior; and cultural conceptualization that focuses on mastery of specific cultural tools (language, mathematics, and so on). Often each one of these aspects is studied separately, sometimes even by different disciplines (psychology, linguistics, anthropology, and so on). The authors perceive the advantage of Vygotsky's approach in that it demonstrated that all three of these aspects reflect the same essence of the human mind—its emergence from the culturally mediated formative process. Vygotsky's analysis of the developmental process identifies four stages of sign/symbol use during childhood. The first stage is characterized by children's attempts to cope with a task by using only natural abilities without reference to possible signs/mediators. During the second stage, children acknowledge the presence of potential mediators but are still unable to use them efficiently. The third stage is probably the most typical of child performance at the primary school age. Children become quite capable of using a set of external signs/mediators for organization of their cognitive functions and self-regulation of their behavior but still do not possess them as their inner psychological tools. Only at the fourth stage, and not in every case, do signs/mediators and operations with them become internalized and transformed, creating a basis for inner symbolic activity that mediates all interactions between a person and his or her environment.

The chapter on the development of higher psychological processes incorporates two important aspects of Vygotsky's theory: the distinction between so-called natural psychological functions and higher or cultural psychological functions and the role of education in the development of higher mental processes. The developmental process is seen by Vygotsky as being governed by three laws. The first is the law of transition from natural psychological processes dependent on genetics and individual direct experience to the cultural psychological processes dependent on acquisition of external symbolic tools/mediators. The second law describes the cultural requirements of such a transition, primarily the interaction between

an ideal cultural form of thinking represented by adults and the current form of thinking of the child him- or herself. The third law formulates the process of transformation of external symbolic mediators into the mastery of internal psychological processes through a system of inner psychological tools. In what concerns education, the authors emphasize Vygotsky's insistence on the formative role of education in shaping the higher psychological processes. They also argue that the role of a teacher as a model from which children internalize the advanced ways of thinking is more prominent in Vygotsky's writing than the involvement in peer learning. Thus, the latter cannot strictly speaking be attributed to Vygotsky's approach. The teacher in Vygotsky's pedagogical model is a teacher of cognition in a sense that he or she makes students aware not only of the relevant curricular activities but also of the required psychological functions.

The second part of the book presents Vygotsky's ideas regarding language and concept formation. In their presentation of Vygotsky's theory of child language, the authors follow the well-known pattern of the discussion between Vygotsky and Piaget regarding the role of so-called egocentric or private speech and its relation to social-communicative as well as self-regulatory inner speech. Regarding educational implications of speech development, the authors emphasize the crucial role of language environment in general and parental mediation in particular for the enhancement of child's language. Unlike other chapters often based exclusively on Vygotsky's texts, this chapter includes a number of references to contemporary studies on the impact of parental speech and on variations in child speech development in families with different socioeconomic status.

The chapter on concept formation reviews two major contributions of Vygotsky to this field: identification of various forms of child concept formation as they appear in an experimental situation and distinction between so-called everyday and academic concepts as they emerge in everyday life and educational activities. According to Vygotsky, children display conceptual forms ranging from purely subjective groupings ("heaps") to various conceptual "complexes" based on actual properties of the objects to so-called pseudoconcepts that functionally coincide with true concepts but lack their logical consistency and systemic organization. One of the important aspects of Vygotsky's approach mentioned by the authors is that empirical coincidence of children's responses to the expected conceptual answer does not guarantee that children indeed grasp all the aspects of the concept in question. The product (e.g., the correct answer in a multiple-choice test) does not guarantee that the process underlying this choice is indeed conceptual. Pseudoconcepts play a double role. On the one hand, they establish a common basis for a potentially fruitful dialogue between teachers and students; on the other, they are deceptive in that teachers often take a technically correct but conceptually immature response for a sign of students' complete mastery of the concept. The role of pre- and pseudoconcepts becomes particularly important in academic concept formation. Many of the students' spontaneous concepts are functionally useful in everyday life but produce misconceptions when used in scientific inquiry. The formation of academic concepts is a long process that passes through the stages of identifying the central principle of a given object and process, determining its limits of applicability, establishing connections with other concepts belonging to the same conceptual system, and making empirical predictions and applications. Academically useful concepts can therefore be formed only when teachers engage students in a highly interactive process of learning activities aimed at gradual coconstruction of these concepts. A simple transmission of conceptual formula from teachers to students is ineffective, as ineffective is a spontaneous construction of such concepts by students themselves.

The third part is dedicated to the issue of cycles of child development. Probably the crucial theoretical element in Vygotsky's approach to age-related developmental periods is his notion of "social situation of development." The social situation of development includes both the structure of the child's abilities, interests, and consciousness and the sociocultural goals and expectations projected by adults and social environment in general. This interaction leads to a sequence of critical points after which the child abandons the previous structure and moves to the new form of leading activity and interaction. This part of the book seems to be less coherent than others and for a good reason. Vygotsky just started working on the comprehensive theory of life circles that would include both cognitive and motivational elements but was unable to accomplish this task. This line of Vygotsky's work was continued by his students, most prominently by Daniel Elkonin. The authors, however, chose to refer exclusively to Vygotsky's original texts, and as a result the theory of critical points in child development remains rather detached from the sequence of changes in the children's leading activities envisaged by Elkonin and his followers.

The concluding chapter on implications briefly summarizes the main directions of Vygotsky's work as well as its underlying philosophy. The authors conclude that, as Vygotsky believed in socioculturally specific formation of psychological functions, modern students of Vygotsky's theory should also take into account cultural, technological, and societal changes that have taken place since the original ideas of Vygotsky were formulated.

Gredler and Claytor Shields's book should be welcome by all those who teach Vygotsky's theory because it provides a well-structured and didactically sound text. In actual teaching practice, however, this text should be complemented by a wider range of more recent research that validates, extends, applies, and sometimes challenges Vygotsky's original ideas.

Although both books are based on Vygotsky's theory, *Key to Learning* is different from *Vygotsky's Legacy* in at least two important points. While *Vygotsky's Legacy* is a textbook about theory, *Key to Learning* is a handbook for practice. In addition, while *Vygotsky's Legacy* is based almost exclusively on Vygotsky's texts, *Key to Learning* utilizes the products created by Russian Vygotskians over several decades of intensive research and development activity. Dolya's personal experience also played an important role in shaping the form and content of *Key to Learning*. A teacher in Russia, for many years she was in direct contact with leading developers of Vygotskian preschool curricula in Moscow: Daniel Elkonin, Leonid Venger, Olga Diachenko, and Nikolai Veraksa. After moving to the United Kingdom, she established an early education program based on their work while attuning materials and activities to English-speaking children.

Numerous workshops conducted for teachers in England and Scotland helped to shape *Key to Learning* as a guide for practitioners who would like to prepare young children for the rigorous school curriculum and at the same time foster their age-appropriate behavior and creativity. The book includes 12 units that complement each other and together may serve as a complete curriculum for 3- to 7-year-old children. These units include Sensory Mathematics, Logic, Mathematics, Story Grammar, Developmental Games, Artographics, Visual-Spatial Tasks, Creative Modeling, Construction, Exploration, Expressive Movement, and You-Me-World. The aim of *Key to Learning* is not to speed up the developmental process but rather to create those cognitive, communicative, and behavioral prerequisites that would allow children to construct a broader and deeper zone of proximal development. This is achieved through a series of activities guided by the teacher that are emotionally engaging, playful, and enjoyable.

To give some idea of the activities and materials proposed in *Key to Learning*, let us focus of one of aspects of the program—visual modeling. Vygotskians believe that appropriation and internalization of symbolic mediators is one of the main mechanisms of psychological development. The first step in this direction is to let the child realize that signs and symbols can be used as substitutes of objects and processes. For younger children, this process cannot be carried in verbal-logical form but should rely on perceptual images. Children spontaneously carry many substitutions when in a play situation a chair becomes a car or a pencil becomes a thermometer. The next step is to learn some social conventions in using perceptual symbols as substitutes. So, for example, in the Exploration unit, younger children learn that a schematic symbol of a square capped with a triangle stands for a house, while two large and two small circles placed inside the square stand for mother, father, and two children. In the You-Me-World unit, children are engaged in comparing realistic pictures of activities belonging to different times of the day with symbolic representations of morning, day, evening, and night and also of the day cycle as a whole. The appropriation and use of symbols in this particular activity is associated with the understanding of the concept of time, building the model of the whole day, developing the concept of "between," and engaging in classification activity. The use of visual symbols in the *Key to Learning* classroom also helps children develop self-regulatory skills, such as signs for "check what you have done" or "do this first." For older preschoolers, the use of a plastic ring as a symbol of "group" helps master the notion of classification and even such high-level concepts as intersecting classes (a perceptual version of Venn diagrams).

As mentioned previously, key themes of the program, such as visual modeling, are used in a number of units. One of them is Visual Mathematics. The goal is not to speed up counting activities but rather to create a broad range of cognitive tools that can then be used for a long time, even the entire primary school period. One of the central elements in Visual Mathematics is the development of what Leonid Venger called "sensory standards." Contrary to a well-known Piagetian belief, Venger claimed that young children are potentially capable of systematic comparison and seriation but do not perform the required operations spontaneously because they lack the sensory standards of color, shape, and size. One of the ways to develop shape standards is to use the technique of "magic glasses." Children are first given a set of "magic glasses" that have a square, triangular, or round shape and told that only objects of the same shape can be seen through a particular pair of glasses. In a play situation, children become capable of distinguishing a particular parameter of the object, such as shape, though other parameters, such as size and color, remain the same. Then comes the time for magic glasses for color or size. In this way, children develop an important ability to analyze objects depending on a particular parameter, an ability that becomes crucial in acquiring mathematics skills.

Key to Learning is well designed and user friendly, providing full-color examples of tasks, games, and activities and schematic models of their classroom use. The only drawback is the excessive use of quotations and endorsements put into the text boxes in the introductory part. The Professional Opinions section at the end of the book also seems to cross the line between the handbook and a promotional booklet.

Together, *Vygotsky's Legacy* and *Key to Learning* seem to signify an important transition of the Vygotskyian approach outside Russia from the research to the teaching and practice-oriented stage. The scene is set for more practical applications of the ideas and techniques generated by Vygotsky and his followers in all developmental and educational areas, from preschool to high school and possibly college education. In a spirit of Vygotsky's theory, such applications cannot be a simple transmission of the already existent products to the new

populations of learners but always a creative development that takes into account particular sociocultural goals and conditions.

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Cognitive Modifiability in Learning and Assessment: International Perspectives. Oon-Seng Tan and Alice Seok-Hoon Seng (Eds.). Singapore: Cengage Learning Asia (www.cengageasia.com). 2008, 304 pp., $39.95 (hardcover)

The two editors of *Cognitive Modifiability in Learning and Assessment*, both from the National Institute of Education in Singapore, have compiled an interesting and important collection of chapters by an impressive array of international scholars to describe a variety of approaches that focus on programs that strive to modify and enhance the cognitive functioning of individuals in a diverse array of client populations. The choice of chapters for the book combines an emphasis on neuroscientific evidence related to modifiability/plasticity and the theories and programs of Feuerstein and Lipman.

The 10 chapters move from an introduction to theories of cognitive modifiability (Tan & Seng), to consideration of the relationship between working memory and cognitive modification (Lee & Ng), to review of qualities of temperamental variables related to learning style that can be targeted for modification (Joyce), to discussion of neuron plasticity over the life span (Shing, Brehmer, & Li), to an overview of the relationship between brain structures and functions in relation to development of intelligence and consequences for learning, to consideration of the relevance of concepts of cognitive functions and modifiability to counseling and psychotherapy (Wong), to joining and relating the approaches of Feuerstein and Lipman in relation to classroom practices in South Africa (Green), to application of Feuerstein's coneeptualization of the cognitive map to solution of real-life problems (Howie), to development of a Cognitive Abilities Profile as an assessment tool to document cognitive functions and thereby monitor modification of cognitive functions (Deutsch & Mohammed), and, finally, to a summary of the contributions of neuroscience to the concept of cognitive modifiability (Hon).

In chapter 1, the editors Tan and Seng, both from Singapore, summarize cognitive modifiability theory, essentially equated with the structural cognitive modification theory of Feuerstein and associates. The authors review basic concepts such as mediated learning experience, cognitive functions, and dynamic assessment. Importantly, this chapter provides an overview of studies that document the positive effects of Feuerstein's Instrumental Enrichment on cognitive functioning of both adolescent and adult learners, along with discussion of the difficulty of documenting generalization of these effects to academic performance. The authors present their own modification of mediated learning experience within the context of dynamic assessment in addition to comments relevant to teacher education.

Chapter 2 by Lee and Ng from Singapore reviews the relationship between working memory as a cognitive function (a.k.a. process) and the academic domains of reading and math. Specific evidence of the importance of the involvement of the visual-spatial sketch pad has important implications for both understanding how the process works and providing a target for intervention. The authors then discuss their own research contributions in the domain of algebraic word problems that document the modest but independent contribution of working

memory to prediction of math performance. Finally, the authors enter the very exciting arena of evidence from functional magnetic imagery, referencing a 2001 study by Zago and colleagues that documents activation of linguistic and visual-spatial processing areas during engagement in complex mathematical tasks.

In chapter 3, Joyce, from the United States, provides an overview of temperament-based learning styles and their relationship to teaching and learning. Although not specifically addressed, these styles can perhaps offer specific targets for intervention en route to cognitive modifiability as manifestations of metacognitive functions.

Chapter 4 by Germany-based researchers Shing, Brehmar, and Li provides one of the most central discussions relevant to the primary concerns of this text: life span differences in cognitive plasticity (a.k.a. modifiability), particularly as applied to training studies that involve fluid intelligence and episodic memory. The main conclusions of the authors are presented up front: Plasticity is present throughout the life span but declines in old age, transfer of training even within domains is narrow and even more limited for crossover, and gains from training can be maintained or reactivated. The authors then proceed to provide a useful and interesting overview of the results of a number of studies. The discussion of memory training is particularly interesting because it includes specifics regarding successful strategies of training (mnemonics) and assessment (testing the limits). Of special interest is the authors' discussion of the interface between neural correlates of plasticity and experience, documenting how experience can indeed impinge on neural structure.

In chapter 5, Lebeer, from Belgium, provides another centrally important discussion that focuses on experiences that show promise for taking advantage of neural plasticity that results in modifiability. He begins with a wide-ranging general review of neural plasticity and evidence of the brain's capacity to profit from experience, including to adapt to damage inflicted long after childhood. Although Lebeer himself is a medical doctor, his discussion of neurology is clearly and succinctly stated and quite accessible to the nonneurologist. He presents evidence that demonstrates the influence of both distal and proximal factors on human development and functioning and maintains conservative realism regarding limits to change and plasticity while making the main point of increasing evidence of plasticity in the face of a wide variety of challenging conditions. He ends his chapter with some very helpful implications of research for practice.

In chapter 6, Wong, from Singapore, moves us further along the road of modifiability into the area of treatment. He integrates Reuven Feuerstein's conceptualization of cognitive dysfunctions with Aaron Beck's idea of cognitive distortion into an approach that focuses on modification of the thinking and beliefs of learners. The author provides a useful discussion of cognitive function as an inherent, complex mental processing capacity. Without optimal mediation, cognitive functions can become dysfunctional and result in impaired performance. The constructs of cognitive distortion and dysfunction bridge easily into the realms of mental health and psychotherapy.

In chapter 7, Green, from South Africa, describes a specific program of cognitive modifiability used with children in her country that reflects primarily the ideas of Matthew Lipman. The two guideposts are "classroom community of inquiry" and "stories for thinking." Green views the program as a tool for mediation of thinking and reasoning through inquiry that leads to development of higher cognitive functioning. Lipman's program is built around a series of storybooks and is relevant for use with children between the ages of 6 and 17 years. The program is not specifically designed to apply to academic curriculum but can be easily linked. The focus is on process, and the goal is to develop thinking skills through discussion of basic philosophical

issues and questions, similar to Feuerstein's ideas regarding teacher as mediator. It is encouraging to note that several research studies by master's-degree students are in process.

In chapter 8, Howe, from the United Kingdom, focuses on a portion of Feuerstein's basic ideas called the cognitive map, a conceptual tool used to analyze and develop tasks to enhance cognitive development. Components of the map include task characteristics such as content, phase, functions, operational, modality, level of complexity, degree of novelty, level of abstraction, and level of efficiency required for mastery.

In chapter 9, Deutsch and Mohammed, also from the United Kingdom, describe their Cognitive Abilities Profile (CAP) for use by educational (school) psychologists. The CAP was developed to address concerns about the time, relevance, and training needed to conduct dynamic assessments. It is a consultation tool that guides observations within a tripartite model of student, mediator, and task and is used within a teaching–learning context. Although not per se dynamic assessment, the CAP (a set of three observation instruments) can potentially be used to record the results of a dynamic assessment as well as an independent observation tool within classroom settings. The goal is to generate a plan that outlines areas of difficulty to target for intervention, including strategies and task components to which the student showed positive response during the course of the observation. The authors include information about their early research results.

Hon, from Singapore, in the final chapter, "Future Directions," returns to the central theme of the book: the relationship between neuroscience and cognitive processing/modification. He poses the question of whether the former can contribute to study of the latter, offering, not surprisingly, an affirmative response. Hon sees the future potential for neuroscience to contribute to efficient and effective individualization of programming to generate positive cognitive modification results.

A definite strength of this book is the general theme of discussion of neuroscience in relation to cognitive modifiability. I agree with the authors who address this topic that theories and programming related to cognitive modifiability can greatly benefit from the evidence of neuroscience. The chapter contributors represent a wide array of international scholars, including those from Germany, the Netherlands, Singapore, South Africa, the United Kingdom, and the United States. The book would have benefited from an even stronger and more cohesive alliance between these two domains as well as a tighter relationship among the chapters.

I think that the book is more successful in its discussions of the relationship between neuroscience and cognitive plasticity/modifiability than in its discussion of specific programs, where this linkage tends to get lost. Meaningful coverage of programs addressing cognitive modifiability per se would require yet another text and a much more in-depth and critical analysis.

The book editors have produced fruitful collaborations in their multiple texts on topics related to mediated learning and cognitive modifiability and have widened the array of contributors to these domains. I would encourage them to consider future collaboration on a text that both incorporates and branches off from the thinking presented in their edited works into an original program of assessment and instruction of mediated cognitive modifiability. It would be very exciting to see the results of such a program within a modern Asian context, which is certainly as diverse as anything in the West (if not more so) yet with unique histories and social environments.

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