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The Theory of Developmental Learning Activity in Education: Dialectics of the Learning Content

Hedegaard, Marianne, & Lompscher, Joachim, *Learning Activity and Development*. Aarhus, Denmark: Aarhus University Press, 1999. 332 pp. ISBN 8-772-88815-6 (hbk).

This book presents a very good snapshot of European activity theorists' contributions to education. It is a collection of articles written by Danish, Dutch, German, Italian, Spanish and Russian scholars. Fourteen chapters of the books are split into four sections, titled 'Societal Forms of Thinking and Knowledge', 'Teaching/Learning Activity in Theory and Practice', 'Social Interaction and Development of Motivation' and 'Play and Spontaneous Learning'.

Empirical vs. Theoretical Thinking

There are several common themes to the book. First is a dichotomy between traditional schooling based on so-called 'empirical thinking' and innovative schooling based on 'theoretical thinking' (chapters 2, 6, 7, 8, 9, 11, 12). This dichotomy was developed by Vasily Davydov (1930-98), to whom the book is dedicated and whose chapter, titled 'What is Real Learning Activity?' (chapter 6), constitutes the key focal point to this volume. Davydov's chapter provides a wonderful outline

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of the theory of developmental learning activity that he built in the tradition of his teacher Leontiev, a colleague of Vygotsky. According to Davydov, empirical thinking involves pattern recognition of perceived objects and events in order to organize the patterns into various groupings and hierarchical classifications, whereas theoretical thinking is a special purposeful activity aimed at transforming material reality via the analysis and modeling of the essential relationships derived once the phenomenon in question is constituted dialectically. Davydov argued that empirical thinking emerges in everyday practices and that traditional schooling follows rather than leads development of children. In his view, 'the real developmental learning activity' must involve development of theoretical thinking in students.

Davydov's pedagogical reform calls for a revision of the content of school curricula in order to develop a series of learning activities for students aimed at revealing the essential dialectical contradiction in the studied phenomenon and representing this contradiction in models offered by the teacher. Davydov contrasted teaching numbers in a traditional school, based on abstracting patterns from concrete objects (e.g. what do a group of two apples and a group of two pencils have in common?), to teaching numbers as a problem of measurement (e.g. how does one compare the length of two objects that cannot be laid together?).

In traditional schooling, number is the result of extracting abstract patterns from concrete objects. This abstraction is arbitrary—instead of the quantitative numerical relation between the two groups of objects (i.e. apples and pens) taught by the teacher in a traditional school, it easily could have been another relation constituting the pattern (e.g. the apples and the pens belong to Mary, or the apples and the pens are green). From Davydov's point of view, the quantitative numerical relationship is non-essential for the classroom activity that the traditional teacher offers of abstracting numbers from concrete objects.

In contrast, in the activity of comparing the length of two separated, remote objects, students have to invent a mediated measurement using a third, smaller, object (i.e. a unit of measurement) that can be moved from one compared object to the other. In this case, number is a model representation of proportion embedded in the students' actions of measurement and comparison. The relation of proportion involves a dialectical contradiction between variant numbers representing the absolute length of each of the two compared objects (this number depends on the chosen unit of measurement) and the invariant proportion of the relative lengths of the two compared objects. For

example, the length of a classroom aquarium can be 2 measured by a pencil and 3 measured by a pen; while the length of a cubby (the little box in which many US elementary school children keep their personal belongings) can be 3 measured by the pencil and 4 and a half measured by the pen. Although the absolute lengths of the aquarium and the cubby are various depending on what unit of measurement is chosen—the pencil or the pen—their relative, proportional length remains the same, which is 2:3 (i.e. $2/3 = 3/4.5$).

This relation is dialectical because both absolute and relative lengths mutually constitute each other in the notion of proportion (and modeled in fraction number). The quantitative numeric relations are essential, and not arbitrary, in the classroom activity of comparing the lengths of remote objects. And thus, Davydov argued that fractions, and **not** integers, are the essence of quantitative mathematical relations and that teaching numbers has to start with teaching fractions as they apply in measurement if the school wants to foster new theoretical rather than old empirical thinking in children. These ideas have been successfully tested and realized in an innovative curriculum developed by Davydov and used by teachers in several Russian schools.

Mariane Hedegaard, in her chapter 2, titled 'The Influence of Societal Knowledge Traditions on Children's Thinking and Conceptual Development', presents her research on the innovative teaching of history in a Danish fourth grade based on Davydov's theory of the development of theoretical thinking. She demonstrates that through a classroom collaborative analysis of historical essential dialectical relations, such as the use of tools in human societies, the fourth graders developed personal knowledge, new learning motives and theoretical thinking that they applied to diverse historical contexts in their classroom activities. These findings are in contrast with traditional history instruction, where very few students develop personal knowledge, new motivation to learn history, and theoretical thinking on historical subject matter.

Davydov's notion of theoretical thinking is further conceptualized in chapters 11 and 12. In chapter 12, titled 'Development of Evaluation at the Initial Stage of Learning Activities', Yuri Poluyanov and Tatyana Matiss discuss the development of children's self-evaluation and reflection in classroom art activities as part of an innovative art program. Through classroom discussions and playing roles of audience and judges, where they select artwork of other children and publicly explain what they like and dislike in other children's artwork and why, the students develop new positions representing both the

author's and audience's point of aesthetic views. This singular 'artist-spectator' position begins to guide the students' artistic work. The authors severely criticize the practice common in a traditional school where judgment of the students' artwork is reserved for the teacher.

Galina Zukerman's chapter 11, 'Diagnosing Learning Initiative', presents a new experimental method, similar to the one described by Davydov, of testing whether a child initiates requests for help in his or her special learning action. Zukerman developed a special task for two children consisting of the production of mittens **when** the children have to coordinate their action for a successful production under two conditions: (1) the coordination can be mediated only through an adult and (2) the coordination can use verbal communication between the children, neither of whom cannot see the actions of his or her partner. She found that students' initiations of their requests for help can be categorized according to four hierarchical levels. At the lowest level, children do **not** ask for help at all and do not try to coordinate their actions even if they are faced with unsuccessful outcomes of their work without coordination. The next level is when children ask the teacher to do the activity for them. The third level is **when** children ask for help in a non-systematic manner, ignoring **some** important aspects of their own and their partner's actions. Finally, at the fourth level, **the** children ask for help in a systematic way. Zukerman applied **her tests** to first-, second- and third-grade students in the following three types of instructions: (1) traditional instruction based **on** empirical thinking and transmission of knowledge; (2) Davydov's innovative instruction aimed at theoretical thinking as carried out mainly in the whole-classroom discussion format; and (3) Davydov's innovative instruction aimed at theoretical thinking as carried out mainly in **the** small groups cooperative learning format.

The results of the tests show that in a traditional school, initiating learning with an adult has **not** been developed by the third grade at all (0%); however, these third graders demonstrated some ability to initiate learning with peers (26%). In Davydov's whole-classroom discussion innovative instruction, the ability to initiate learning with an adult was already present in the first grade (29%) and goes up to 46% by the third grade. Children's ability to initiate learning with peers increases from 47% to 96%. As for Davydov's small group innovative instruction, children's ability to initiate learning with an adult progresses from 38% in the first grade to 64% in the third grade. Their ability to initiate leaning with peers already reflects a ceiling effect in the first grade, reaching 95% and slightly increasing to 100% in the third grade. Zukerman concludes that traditional instruction based **on**

empirical thinking and transmission of knowledge does not foster the ability to initiate learning in children, while Davydov's model of instruction aimed at fostering theoretical thinking does. Within Davydov's innovative instruction, the format of cooperative learning in small groups fosters the ability to initiate learning faster and more effectively than do whole-classroom discussions.

In his chapter 7, titled 'Learning Activity and Its Formation: Ascending from the Abstract to the Concrete', Joachim Lompscher focuses on another aspect of Davydov's theory, which emphasizes that school curricula have to start with the abstract relation and then ascend to the concrete level. In this context, **the** abstract means a concrete activity or even a concrete task, which, by its solution, enables a student to solve a family of other tasks. Davydov argued that **the** activity is **not** abstract because it has an abstract form (e.g. math symbolism)-there is nothing abstract in math symbolism itself. A concrete activity becomes abstract for the student only if it **can** help the student to generalize. Thus, the relationship between **the** abstract and the concrete is dialectical (this dialectical notion of the abstract and the concrete was borrowed by Davydov from Hegel and Marx, probably via Soviet philosopher Ilyenkov).

It is impossible to provide as comprehensive a critique of Davydov's theory as it deserves but I outline a few conceptual objections that I can foresee. First, Davydov's theory of empirical and **theoretical** thinking can be criticized from ecological, connectionist and pragmatist approaches that argue that pattern recognition is fundamental to learning and cannot be placed in opposition to theoretical/dialectical thinking. Second, as Bakhtin (1979) pointed out, dialectics is a very sophisticated but still monological approach. It tries to reduce messy networks of hybrids of artifacts, practices and communities (Latour, 1987) to **one** essential contradiction. There is one authority in the classroom that decides what relations are essential in a phenomenon, and that authority is the teacher trained in Davydov's theory and Hegelian-Marxist dialectics. However, the dialectical voice is one voice among many other voices. It is not to be automatically privileged (Bibler, 1991). Third, situated cognition, multicultural and feminist approaches can suspect Davydov's theory of being modernist, scientist (i.e. privileging scientific knowledge over all over types of knowledge), and uncritical of its own cultural, political and historical bases aimed at destroying traditional communities and propagating networks of decontextualized practices and institutions that are rooted in specific middle-class cultures (similar to Plato's ideal society governed by philosophers).

Everyday vs Scientific Thinking

The second theme, spanning several chapters of the book (chapters 2, 3, 6, 7, 8, 10, 11, 12, 14, 15), is a dichotomy **between** 'everyday' and so-called 'scientific' notions and thinking. Without a doubt, this dichotomy is Vygotsky's legacy (Vygotsky & Kozulin, 1986). According to Vygotsky, scientific thinking is characterized as systematic, comprehensive, coherent, formal, decontextualized, abstract and hierarchical, whereas everyday thinking is syncretic, incoherent, non-systematic, functionally pragmatic, contextualized, **concrete** and informal. Although elsewhere Davydov criticized Vygotsky for **not** being dialectical in defining scientific thinking, he and many other scholars working in activity theory accept Vygotsky's basic premise of the dichotomy between scientific and everyday thinking.

Another line of contention between Davydov and Vygotsky (reflected in the book) is **that** Vygotsky interchangeably used 'scientific' and 'schooled' thinking, implying that children learn scientific learning in school through specially organized guidance that differs from guidance in everyday practice. Although Davydov agreed with Vygotsky about the historical specificity of schooled guidance, he disagreed that traditional schooling had **anything to do with teaching** 'theoretical thinking' (the term, although different, is parallel to Vygotsky's 'scientific' thinking). This disagreement is reflected in the book. For example, Elena Kravtsova in her chapter 14, titled 'Preconditions for Developmental Learning', reports a correlation between teachers' judgment of students' academic quality and students' demonstration of decontextualized thinking, objective self-evaluation and perspective taking. Similarly in chapter 3, titled 'Speech Genres and Rhetoric: The Development of Ways of Argumentation in a Program of Adult Literacy', Juan Ramirez, Maria Cala-Carrillo and Jose Sanchez-Medina demonstrate that after taking literacy classes many adult female students improved their argumentation, which becomes more decontextualized, universal, abstract, comprehensive, consistent and systematic. This study is reminiscent of Vygotsky and Luria's famous cross-cultural research in Soviet Asia showing that the thinking of illiterate and unschooled adults is deficient in comparison to the thinking of schooled literate people from **the** same area (Luria, 1976). As we noted above, many **other** chapters of the book are reluctant to credit school (i.e. traditional school) for development of highly valued 'scientific or 'theoretical' thinking. On the contrary, they severely criticized traditional school exactly for its failure in this respect.

It is worth mentioning, at least briefly, **here** that there are other

approaches to the everyday-scientific dichotomy. Scholars working within a situated cognition approach challenge **the** assumption that everyday thinking is deficient while decontextualized thinking (so highly praised by both Vygotsky and Davydov) is advanced (Lave, 1988; Scribner, 1990). They also challenge the idea that advanced learning can only be possible under specially organized schooled conditions (actually they seem to argue the opposite). Finally, they disagree with Vygotsky and Davydov (and their followers) that there is a **strong** qualitative boundary between everyday and schooled/scientific thinking; rather, they view schooled/scientific thinking as situated in the institutional practices of school and science. These views are supported by the findings of sociological research on science (Latour, 1987). Some other scholars working within an activity theory framework also challenge this everyday-scientific dichotomy (Cole, 1996; Engeström, Mietinen, & Punamaki-Gitai, 1999).

Formative Stage Theory

The third theme of many chapters in the book is **the** use of a stage theory with its methodology of diagnostics aimed to test 'at what developmental stage/level/phase the students are'. This theme **can** be found in all six chapters written by Russian scholars. In my judgment, these stage theories and methodologies are firmly grounded in Vygotsky's work and dramatically contrast with, for example, Piaget's stage theory. Piaget's stage theory can be characterized as 'emergent': strictly consecutive developmental stages emerge from biological maturation and the individual's active interaction with the environment. Vygotsky's stage theory can be called 'constructivist' or 'formative': strictly consecutive stages of the individual's natural development (i.e. similar to **ones** described by Piaget) can be shaped and transformed by guidance. This formative stage theory explains Vygotsky's claim that to understand child development **means** to transform it (this was Vygotsky's paraphrase of Marx's famous statement about history).

Chapter 8, 'Psychological Mechanisms of Generalization' by Nina Talyzina, is a good example of a formative stage **theory**. She starts by describing research showing that young children fail Vygotsky-Sakharov tests (Vygotsky & Kozulin, 1986) **on** development of new concepts based on arbitrary crossing of formal attributes of objects and labeled with novel, nonsensical words (e.g. 'dek' for high figures with large base). Then Talyzina introduced children to a 'gnome game' where different-sized gnomes are supposed to live in different-sized 'houses' symbolized by special cards with different base sizes. The

cards and gnomes had attributes like color and texture non-essential for the 'game'. The experimenter introduced the gnome by listing essential and non-essential attributes and asked the child to place gnomes in their 'houses' and to justify their decision. Children who had problems with understanding the 'game' (some of whom were diagnosed with a developmental delay) were scaffolded (Wood, Bruner, & Ross, 1976) by breaking the task into subtasks manageable to them and by gradual transfer of responsibility for the task to them. Finally, the initial test was repeated again and nearly all children (both normal and with developmental delay) could manage to do the task of generalizing the newly constructed concept. Talyzina claims that her formative guidance speeds up natural development of cognition in children.

There are two chapters in the book that challenge this formative stage theory developed in the Soviet Union and continued in Russia. In chapter 9, titled 'Developmental Teaching in Upper-Secondary School', Seth Chaiklin challenges the Leontiev-El'konin-Davydov theory of leading activities, according to which child development can be represented as sequential stages of leading activities where developmental mostly occurs. Thus, according to the theory, preschoolers' leading activity is (imaginative) play. For elementary school children, the leading activity is the learning activity introduced in school. For upper-secondary school children, the leading activity is social interaction with peers. And for late teenagers, it becomes socially useful and occupational activities. According to Davydov, developmental teaching occurs primarily in the child's leading activity (that is probably why Davydov's own research interest was mainly limited by his focus on elementary school children for whom the leading activity is the classroom learning activity or pure learning). Through analysis of an innovative science program in an upper-secondary classroom, Chaiklin demonstrates how learning can become a leading activity for upper-secondary school children. He argues that leading activity itself is a socio-historical and cultural construction rather than a natural developmental sequence imposed by the society. There seems to be nothing natural in natural development.

Similarly, Bert van Oers in his chapter 13, 'Teaching Opportunities in Play', argues against dichotomizing play and classroom learning activities. Like Chaiklin, he analyzes an innovative program (in a preschool) to demonstrate that the teacher can provide developmental teaching and semiotic modeling within children's play through **col**-laboratively building race-tracks. The task the children faced was to 'save' their most successful track for future play. The children found

that their memory did not produce a reliable way of rebuilding a tack. Teacher-supported modeling on paper focused the children on extracting the most essential details of the track for its reconstruction. Van Oers argues that play opens **huge** opportunities for developmental **teaching** that has to be collaborative and opportunistic. He clearly contradicts Gennady Kravtsov and Elena Bezezhzhkovskaya (chapter 15, titled 'The Education of Pre-school Children'), **who** portray the relationship between play ('child-centered program') and **teaching** ('teacher-centered program') as either-or.

This latter point brings me to a general criticism of the book: it is a collection of articles that do **not** talk with **each** other. An opportunity has been lost to organize a discussion among the authors such as could have been held between Oers on one side and Kravtsov/Bezezhzhkovskaya **on the** other. I found another dialogical tension worth exploring between Georg Rückriem's chapter 5, titled 'The Crisis of Knowledge', and Davydov's chapter discussed above. In his chapter, Rückriem makes a provocative claim **that** the current wave of students' violence in school can be caused by 'epistemological violence' that schoolteachers launch against students. The **essence** of this 'epistemological violence' is that in other practices (science, art, everyday practices) individuals arrive to knowledge that is not pre-set and is pragmatically bounded, while in school students are forced to arrive at knowledge that is pre-set by the teacher through leash-like 'discovery' at its best and through transmission of knowledge at its worst. It would be interesting to explore **how** Davydov's notion of developmental **teaching** and theoretical thinking would address the issue of 'epistemological violence' raised by Rückriem and whether Rückriem would see developmental teaching described by Davydov as a solution to the 'epistemological violence' problem.

In sum, **the** book is a collection of articles mainly focused on the application of activity theory in education. It provides rich empirical and conceptual material for all those who are interested in education and developmental psychology and could be especially useful for people working within the Vygotsky-oriented family of approaches.

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Biography

EUGENE MATUSOV is an Assistant Professor of Education at the University of Delaware. He was born in the Soviet Union. He studied developmental psychology from Soviet researchers working in the Vygotskian paradigm and worked as a schoolteacher before emigrating to the United States. He got his Ph.D. in developmental psychology from the University of California. His research and educational interest is studying how to design safe learning environments (informal and formal) without failure for all students. He uses a sociocultural approach in his research. In this sociocultural approach, learning is viewed as transformation of participation in a sociocultural practice. Sometimes, for political, economic, historical, social and cultural reasons, a person's access to meaningful participation in practices is blocked and desirable learning is arrested. Eugene Matusov is interested in the process of how the access to participation in valuable practices meaningful for a learner is systematically denied and of how people learn to become 'disabled' in institutional settings (especially, in schools) as a result of this. ADDRESS: Eugene Matusov, School of Education, University of Delaware, Newark, DE 19716, USA. [email: ematusov@udel.edu]