

Vygotsky and Context: Toward a Resolution of Theoretical Disputes

Michael Cole, Laboratory of Comparative Human Cognition. U.C. San Diego

Natalia Gajdamaschko, Simon Fraser University

Prepared for a volume entitled *Sociocultural Perspectives in Psychology: Constitutive, Strongly Relational Approaches*. S. Kirchner & J.Martin (eds).

The publication of English versions of a large portion of Lev Vygotsky's writing, supplemented by a number of excellent scholarly examinations of both those writings and their relationship to antecedent and contemporaneous thinkers, have enormously expanded the horizons of our knowledge about the work of L.S. Vygotsky and immediate colleagues (Vygotsky, 1987-1997; Van der Veer & Valsinser, 1991; Wertsch, 1985). Simultaneously, there has been a rather broad recognition of the pitfalls of inter-cultural appropriation of Vygotsky's ideas which requires a critical approach to all claims of authenticity about adherence to presumed originals or fidelity in application of the ideas in contemporary scholarship on learning and development (Cole & Gajdamaschko, 2006; Karpov, 2005; Kozulin, A., Gindis, B. Ageyev, V.S. & Miller, S.M., 2003).

This chapter is intended to contribute to this ongoing re-appraisal. We seek to use a comparison of Vygotsky's use of the concept of context (and similar terms such as environment and situation) with the interpretation of such terms used by Americans who believe they are following the teaching of Vygotsky and his students. Our goal is to better understand competing interpretations of performance differences between children of different ages from the same culture, people of the same age from different cultures, and the developmental consequences associated with school attendance in societies that lack universal formal schooling so some children attend school while others do not. We believe that disagreements between Russian and American psychologist with respect to these issues go

beyond the area of cross-age and cross-cultural research to touch upon general questions of the role of culture and context in the development of human mental functioning. Seeking ways to resolve differences with respect to these issues is an important task of contemporary followers of Vygotsky's tradition.

Context: Variations in meaning

Contemporary notions of context vary enormously across national traditions, disciplines and individual users. For example, the definition of "context" in the 1958 *Dictionary of the Russian Language* is "The boundaries of a fragment of written language that makes it possible to establish the meaning of a word or a phrase within those boundaries" (Barukhadarov et al., 1958). By Anglo-American standards, this is a very narrow definition. For example, the Oxford English Dictionary defines context as "the connected whole that gives coherence to its parts," a definition which can apply to a broad range of phenomena. Clearly, we need to be cautious at the outset in comparing American and Russian ideas with respect to the key concept of our concern here.

American uses of "Context"

Among American psychologists, context is ordinarily used in three general ways. First it appears as a rough equivalent of the term, environment, referring to a set of circumstances, at different levels of scale, within which children interact with the artifacts and people which are said to influence the child in various ways. Thus, it is common to encounter articles that speak of the influence of family or classroom contexts as the proximal environment of children's behavior or the "social-interactional context" (Winegar & Valsiner, 1992).

A closely related use of context such is that employed by Wertsch (2000) when he argues that any social interaction has to be considered in "the broad sociocultural context in which it occurs" [because] "any episode of human action must occur in a specific cultural,

Mike Cole 10/7/06 1:22 PM

Deleted: T

historical, and institutional context, and this influences how the [interpersonal] action is carried out (p. 18). This approach that conceives of children “in” a context naturally invokes the image, made famous by Bronfenbrenner (1979), of context as a nested set of socio-ecological arrangements with various interpersonal-relationship in proximal “contexts” (family, home, church, etc.) embedded in successively more inclusive “socio-cultural contexts.” Wertsch suggests that linkages between the levels of context thus interpreted can best be understood in terms of the cultural tools (language, counting systems, writing, maps, etc) that are provided by the sociocultural context and used by individuals in the interpersonal context. Reciprocally, mastery of the use of cultural tools in the proximal contexts allows children to generalize what they learned from one social-interactional context to another, a process that is central to overcoming the narrow, “context-bound” nature of young children’s thought processes.

It is less common for psychologists to use the term context in a manner consistent with the dictionary definition given above as a “whole in relation to its parts.” This relational notion of context harks back to the Latin origins of the term, *contexere*, meaning to weave together as when the warp and woof of different colored threads on a loom are woven together to create a meaningful pattern. From this perspective, the “text” and that which accompanies the text (the “con”-text) are inextricably co-constitutive (Cole, 1996; McDermott, 1983).

Vygotsky’s use of “Context” and Associated Terms

Given the narrow definition of “context” found in dictionaries of the Russian language, it should come of little surprise that the topic for which Vygotsky most explicitly evokes the use of the term is in his discussion of the relationship between sense and meaning (Vygotsky, 1987). However, unlike the compilers of the dictionary, he goes beyond written language to consider spoken language:

Meaning is only one of these zones of the sense that the word acquires in the context of speech. In different contexts, a word's sense changes. In contrast, meaning is a comparatively fixed and stable point, one that remains constant with all the changes of the word's sense that are associated with its use in various contexts (1987, p. 276).

Moreover,

The actual meaning of the word is inconstant. In one operation, the word emerges with one meaning; in another, another is required. Isolated in the lexicon, the word has only one meaning. However, this meaning is nothing more than a potential that can be realized in living speech., and in living speech meaning is only a cornerstone in the edifice of sense (p. 276).

The example Vygotsky uses to illustrate the way in which linguistic context conditions the relation of sense to meaning is a fable by Krylov (an example from written language).

The word "dance" with which the fable ends has a definite and constant meaning. This meaning is identical in all contexts. In the context of this fable, however, it acquires a much broader intellectual and affective sense. It simultaneously means "be merry" and "die." This enrichment of the word through the sense it acquires in context is a basic law of the dynamics of meaning. The word absorbs intellectual and affective content from the entire context in which it is intertwined (p. 276).

When he moves beyond the domain of language, Vygotsky appears to prefer to use other terms, such as situation or environment rather than context as a reference term. For example, an important concept in Vygotsky's thinking about development is the "social situation of development." By the "social situation of development" Vygotsky meant "the relations between the personality of the child and his social environment at each age level"(1934/1998- Volume 5, p. 198). According to Vygotsky,

“at the beginning of each age period, there develops a completely original, exclusive, single, and unique relation, specific to the given age, between the child and reality, mainly the social reality, that surrounds him. The social situation of development represents the initial moment for all dynamic changes that occur in development during the given period. It determines wholly and completely the forms and the path along which the social becomes individual (p.198, Vol. 5)

Two features of this statement are important to note. First, Vygotsky is here using situation more or less in the sense of “life situation as a whole,” and not to any particular situation (setting/context) that the child might be inhabiting at a particular moment (we will return to examine the consequences of this choice below). Here we focus on a second feature, perhaps related feature that invites a misunderstanding we take to be quite widespread – the possibility that Vygotsky assumes that the social-interactional context acts as an external influence on development. Contrary to such an interpretation, Vygotsky wrote with respect to the social situation of development that

One of the major impediments to the theoretical and practical study of child development is the incorrect solution of the problem of the environment and its role in the dynamics of age when the environment is considered as something outside with respect to the child, as a circumstances of development, as an aggregate of objective conditions existing without reference to the children and affecting him by the very fact of their existence (Vol. 5, p. 198).

Instead, for Vygotsky, the social situation of development is a relational construct in which characteristics of children combine with (are interwoven together with) the structure of social interactions in their proximal environment to create the starting point for a new cycle of developmental changes that will result in a new, and higher, level of development (and a new, relevant, social situation of development).

This relational orientation is highlighted by two well known Vygotskian principles.

First, moving in the direction of adult → child there is what Vygotsky termed "the general law of cultural development":

Any function in children's cultural development appears twice, or on two planes. First it appears on the social plane and then on the psychological plane. First it appears between people as an interpsychological category and then within the individual child as an intrapsychological category... but it goes without saying that internalization transforms the process itself and changes its structure and function. Social relations or relations among people genetically underlie all higher functions and their relationships (Vygotsky, 1981, p.163).

Although invocation of the idea that inter-personal functions precede intra-personal functions is sometimes taken as evidence that Vygotsky was a kind of "social learning" theorist (ref) who believed that the social environment "causes" development, we believe this to be a serious misreading. Throughout his writings, Vygotsky insisted that children do not simply receive cultural tools passively, but actively appropriate them to their own uses, declaring repeatedly that "in the beginning was the deed."

The child's active, dynamic, participation in creating the social situation of development was embodied in the crucial experimental method he constructed as a model of the specifically human "cultural method of behavior" (Vygotsky, 1929), the "method of dual stimulation" in which children were confronted with tasks that were beyond their present capabilities. He characterized the essence of this method as follows

In such cases a neutral object is placed near the child, and frequently we are able to observe how the neutral stimulus is drawn into the situation and takes on the function of a sign. Thus, *the child actively incorporates these neutral objects into the task of*

problem solving. We might say that when difficulties arise, neutral stimuli take on the function of a sign and from that point on the operation's structure assumes an essentially different character. (Vygotsky, 1978, p. 74-75)

The active appropriation of stimuli not necessarily or obviously involved in the problem solving situation was, in Vygotsky's view, the characteristic that most clearly distinguished human and non-human animals. The development of this "indirect, instrumental, mediated" form of behavior was the subject matter of many experiments (see Vygotsky, 1978, 1997).

For example, he and his colleagues replicated Köhler's famous experiments with apes with young children who wanted to obtain cookies from a jar high on a cupboard. Frustrated by their failures, they engage in what Vygotsky refers to as "an imbroglio of actions" that appear at first bewildering to the experimenter. But, Vygotsky writes,

The child, after having completed a number of intelligent and inter-related actions which should help him successfully solve the given problem, suddenly, upon meeting a difficulty in realization of his plan, cuts short all attempts and turn for help to the experimentalist, asking him to move the object nearer and thus give him the possibility to accomplish his task. ... [Thus] the child, first separating verbal description of the action from the action itself, crosses the border of co-operation, socializing his practical thinking by sharing his action with another person. ... The control of another person's behavior becomes, in the given instance, a necessary part of the child's entire practical activity (1930/1994, p. 117).

This same general pattern of behavior was traced in many experiments involving a variety of psychological functions including memory and attention. In these latter cases, children were given various possible "neutral" stimuli that might, but did not have to be used to accomplish the task at hand. With respect to remembering, for example, children were

asked to remember a series of words and were given pictures that might be used to remind them of the words. Young children ignored the pictures or failed to use them effectively even if the pictures were pictures of the word's meaning (cup, pencil). Somewhat older children could use such transparently related stimuli to help them remember, but could not use pictures that required them to think of a relationship to the to-be-remembered words (a picture of a pencil as a possible reminder of the to-be-remembered word, notebook). Still older children could effectively use even the obscure auxiliary stimuli to help them remember, a form of behavior that Vygotsky likened to tying a string around one's finger in order to remember something; the string in this case is clearly a neutral stimulus with respect to the to-be-remembered action.

Of course, in everyday interactions between children and their social worlds, the objects (cultural tools) that are introduced by others are not neutral, but rather, selected for what people take to be their appropriateness to the circumstances. But the essential point is that children, no less than their social interlocutors, are actively incorporating cultural tools and each other's behavior into their own actions to the best of their abilities, creating what has come to be termed a "co-constructual" account of the cultural mediation of development (Wozniak, 1992). This double sided, dialogic process clearly highlight the fact that at least in terms of face to face interactions, contexts/ situations/ environments were, for Vygotsky, the emergent outcome of the weaving together of separate "threads of history."

Finally, there are many places in his writing where Vygotsky invokes what Wertsch refers to as "the broad sociocultural context" which, characteristically, he conceived of in cultural-historical terms. So, for example, the discussion in *Studies in the History of Behavior*(1930/1993), co-authored with Luria, traces a general line of historical development from "primitive man," (which they take to be an abstraction that provides a hypothetical starting point for historical development). The advent of writing was seen as a particularly

important cultural advance because it made fixation of past experiences far more reliable and as a consequence, accelerated the development of culture. Cross-cultural research, within this framework, provided a promising way to recover the psychological state of primitive man and thereby to be able to trace the process of psychological/cultural evolution. Improving on the past to create ever-more-developed modes of life.

In another publication written about the same time, Vygotsky re-asserts the basic Marxist position that human consciousness depends upon human beings' ways of life in their society, and underscores what he then believed to be a fundamental change in human personality that accompanies the transition from a capitalist to a socialist way of life. (Vygotsky, 1934/1994).

Some Comments on Differences in Conceptions of Context Reviewed

In surveying the growing interest in the cultural-historical approach of Vygotsky and his followers some two decades ago, one of the present authors noted that what appeared to be taking place at the time was a fusion of the Russian emphasis on diachronic (historical) variation with an American emphasis on synchronic, "contextual" heterogeneity. In principle, he argued, the cultural-historical approach, with its emphasis on the social environment and the centrality of tool mediation as central to human psychological development implied the need for cultural-historical psychologists to pay close attention to synchronic variation:

a focus on tool-mediated action as a central mechanism of development implied some degree of context-specificity. In their quite correct insistence on the mediated nature of the mind and the instrumental aspect of mediation, embodied in the notion of psychological tools, the founders of the sociohistorical school neglected the cardinal fact that there is no universal, context-free tool. Rather, all tools embody simultaneously a theory of the activity they have been designed to fulfill and a theory of the human beings who must carry out the activity. Tools vary from highly

specialized to relatively general with respect to the tasks they can fulfill. . . . But the dream of a context-free tool . . . completely misinterprets the relationship between human beings and the world, denying the mediated, and always incomplete nature of human knowledge (Cole, 1988, p. 148).

We have little doubt that Vygotsky and his colleagues would have agreed with this general point but on our reading of their work, synchronic variability of behavior “across contexts/situations/activities” was muted in comparison with their emphasis on diachronic, developmental, change.

As noted earlier, from an American perspective, what strikes one about Vygotsky’s characterization of the social situation of development, in addition to its rejection of the environment as an external influence on children in favor of a “interweaving,” co-constitutive interpretation is that he writes as if there existed only one social situation of development for a given child at a given age period. This seeming uniformity is highlighted, for example, when he claims that the social situation of development is an “exclusive, single, and unique relation, specific to the given age, between the child and reality . . . (vol. 5, p.198).” By contrast, Americans who invoke context emphasize the heterogeneity of the many “social-interactive contexts” (social situations of development?) that children inhabit and the heterogeneity of levels of development that accompany their varied modes of participation. the term, situation, is not being used by Vygotsky in a manner similar to usage in Anglo-American psychology.

This divergence of views also appears in his treatment of the “larger sociocultural context” leading James Wertsch (1991) to comment that for the Russian cultural-historical psychologists, cross-cultural work was essentially cross-historical. We will return to address these issues after reviewing two lines of research where different ideas about context/situation

and development lead to competing interpretations of what appear to be the same psychological phenomena.

Interpreting Cross-cultural Variation: Developmental advances and Contextual Variation

One illustration of the kinds of disagreements that can arise from Russian and American psychologists' differing conceptions of context arises with respect to cross-cultural research in which both cultural-historical and ontogenetic variations play a prominent role. A famous case in point is research conducted by Alexander Luria and his colleagues on the modes of thinking of people living in rural Uzbekistan and Kirghizia in the early 1930's when those areas had recently been incorporated into the then- Soviet Union (Luria, 1976). Many of these people were illiterate and had never attended school. Some had attended a few years of schooling and had worked for a time on the newly collectivized farms that were being imposed upon the rural population of the USSR a few years earlier. After presenting Luria's research and conclusions we examine research conducted by Michael Cole and his colleagues in Liberia, West Africa, in the late 1960's at a time when roads were being built into the interior of the country and schools were introduced in some of the towns along those roads (Cole, Gay, Glick, & Sharp, 1971).

Luria's Research in Central Asia

When Luria undertook his research in Central Asia, he assumed that the cultural-historical change from pastoral herding to involvement in industrialized farming, combined with the acquisition of literacy in school are associated with a general change in modes of thought. He phrased his understanding of these changes in the following terms:

Conceptual thinking involves an enormous expansion of the resultant forms of cognitive activity. A person capable of abstract thought reflects the external world more profoundly and completely and makes conclusions and inferences from perceived phenomena on the basis not only of his personal experience but also of schemes of logical thinking that objectively take shape in a fairly advanced stage of development of cognitive activity.

The appearance of verbal, logical codes enabling one to abstract the essential features of objects and thus assign these objects to general categories leads to the formation of a more complex logical apparatus. This apparatus permits conclusions to be drawn from given premises without having to resort to immediate graphic-functional experience, and makes it possible to acquire new knowledge in a discursive and verbal-logical fashion. This is what provided the transition from sensory to rational consciousness, a phenomenon that the classics of Marxism regard as one of the most important in history (Luria, 1976, p. 100-101).

Luria assessed the evidence for this kind of transition in a wide variety of psychological domains: responses to perceptual illusions, classification of objects by color and shape, categorization of verbally presented sets of objects (hammer-saw-log-hatchet), judgments of similarity of verbally presented objects (chicken-dog, water-blood), deduction and inference (using syllogisms) and solution of verbally presented problems ("It takes twenty hours to go on foot to Dzizak, or five times faster on a bicycle. How long will it take on a bicycle?").

His conclusion for each of these domains was the same: there is a major historical shift in the form of consciousness from a situation-bound, practical form of cognition in which language is not used in an abstract, theoretical way to a form of consciousness in which language operates more abstractly to isolate crucial features of stimuli presented (be they

pictures of objects in the color-form studies, verbal stimuli in many of the other studies) thereby, in his terms, leading to a “more advanced kind of cognitive activity.”

Not only Luria, but his student, Peeter Tulviste (1991) and most recently Yuriy Karpov (2005), interpreted these results as support for the proposition that the new form of activity associated with participation in socialist modes of production, literacy and formal schooling combined with the more advanced forms of social life of which they are a part give rise to an historically new form of thought which Luria referred to as “theoretical” or “verbal logical” and which Karpov refers to as “formal-logical.” This mode of thought is assumed to replace the prior, situation-bound, practical, functional-graphic mode of thought. It is assumed to be pervasive in industrialized societies and developmentally more advanced, historically and ontogenetically, than the mode that precedes it.

Cole and his colleagues also studied the way that non-literate and schooled people responded to a variety of tasks, some of which overlapped closely with those used by Luria (the syllogism problems), some of which involved memory, verbal concept formation, and inferential reasoning using procedures that deviated from Luria’s. Like Luria, they often found that involvement in schooling (they worked with children and adults who had experienced different amounts of schooling) was associated with a marked shift in performance in modes of classification, reasoning, and remembering. But characteristic of their approach was their skepticism about inferring that when a non-literate person failed to respond to a particular task in the way that their schooled counterparts did, such failure represented a general absence of the “abstract thinking,” or dependence on “graphical-functional” categorization. Trained in the American experimental psychology tradition, Cole and his colleagues were keenly sensitive to the strong possibility that when people are presented with tasks for which the contents of the problem, or the conventions of the social interactions comprising the experimental situation, or intimate knowledge of the local

Natalia

Comment: Decontextualized? In that other meaning, Potebnya?

language are unfamiliar, such factors may negatively influence people's performance and hence lower psychologists' estimates of their psychological capabilities.

Consequently they began their work by investigating the kinds of activities that Kpelle rice farmers carry out on a daily basis, the ways in which they categorize the objects in their local environment, the varying uses of language in such settings as a court case or story telling. They also spent time in local schools and interviewed children and youth who had several years of experience of formal schooling. They referred to this enterprise as "ethnographic psychology."

From their investigation of the local language, using a variety of anthropological elicitation methods, they found that while people certainly shared a more or less hierarchically organized category of things in the world, the specific categories as well as the extent to which items in those categories adhered, differed somewhat from one elicitation technique to another. They then chose a set of items that everyone appeared to agree upon regardless of elicitation method, and for which everyone knew the superordinate concepts (tools, cooking utensils, food, clothing) in order to investigate the conditions under which these categories would be used to structure different kinds of cognitive activities such as those involved in free association, classificatory sorting of the objects, concept learning, and free recall memory. Again, results appeared to differ according to the specific task used. A few examples will suffice:

- the verbal free associations to items in each of the four categories were predominantly other items from the appropriate category, regardless of educational level. But classificatory sorting of objects was relatively weak regardless of educational level.
- In concept identification studies in which members of word pairs were either linked with the same category or linked at random, the uneducated Kpelle subjects learned very quickly while educated American subjects learned very slowly. Why? Because

the Americans paid so much attention to the category membership of the materials that they were distracted from noticing the actual pairings, while the uneducated Kpelle subjects simply learned which items were paired together in these particular circumstances and learned quickly.

- When two items from a category were placed on the table and a person was asked to choose an item that went with them from one of the three categories involved (tools, utensils, food), the results depended upon the category involved. When a pair of tools were presented, another tool was always chosen by educated and non-educated groups to go with the tools; when a pair of foods was presented, only high school students, but not 2-5th graders or non-literates of any age always picked another food to include in the category; when two utensils were presented, the two educated groups always chose another utensil to complete the category, but the two uneducated groups, children and adults, chose foods almost as often as other utensils.

Similar variability according to procedures was found in studies of free recall memory in which the same four categories were used and contrasted with a set of equally familiar items that formed no known category. Sometimes the words were presented for recall in random order, repeatedly. Sometimes the actual objects were displayed. Sometimes the items to be recalled were linked to a physical object, such as a distinctive chair associated with each category. Sometimes the objects were embedded in folk stories in various ways.

Overall, these studies indicated that schooled subjects were far more likely to use common categorical membership of to-be-remembered materials when seeking to remember the lists and they soon were able to remember the entire list. By contrast, the non-educated subjects appeared to have little idea of how to go about remembering such lists in a systematic way that would lead to mastery. However, this difference disappeared when the items to be

remembered were embedded in folk stories; when use of the categorical structure of the list made sense in terms of the stories, this information was used by non-literate subjects.

When it came to logical syllogisms, the results of Cole and his colleagues replicated those obtained by Luria to an astonishing degree; non-educated people reasoned in terms of their experience of their everyday experiences as if the syllogism was actually an inquiry into empirically encountered phenomena. They even included some fanciful syllogisms about characters used in local stories named spider and black deer, but the fictitiousness of this content produced no change in the tendency of people to reason in terms of everyday experience. Later, Sylvia Scribner (1977) replicated these findings and showed that when responding empirically, correctness or incorrectness of the person's response depended entirely on whether the contents of the problem were counterfactual or not, confirming Luria's conclusions that there was nothing illogical about people's reasoning in terms of their everyday experience. But when, in Luria's terms, they responded theoretically (e.g., in terms of the verbally given premises) their responses were always correct, even if empirically counterfactual. She also pointed out that in all of her studies some non-educated people responded theoretically, although the proportion of people who did so was significantly less than in the schooled group. So it appeared that at least with respect to syllogistic reasoning, Luria had identified a cultural-historical influence of schooling on reasoning of the general sort he had hypothesized.

However, in later studies, Scribner and Cole (1981) found that when problem content referred to matters about which neither the experimenter nor the subject knew much, other than that the problem was about something that existed in nature and was beyond the experience of either (the presence of particular rocks on the moon) non-educated Vai were much more likely to respond theoretically and correctly, although they almost always responded in terms of everyday experience when posed questions about plausible earthly

scenarios. Moreover, when “moon content syllogisms” were mixed with “everyday content syllogisms” the rate of theoretical responding increased for the empirically plausible problems, suggesting that people’s interpretation of the task had been modified.

A related series of studies by Paul Harris and his colleagues (e.g., Dias & Harris, 1990; Dias, Roazzi, & Harris, 2005) found that uneducated adults in non-industrialized countries also reason accurately from premises and provide “theoretical” justifications for their responses *if cued to the fact that the syllogistic problems are hypothetical by ascribing the statements made to life on another planet.*¹

The same sorts of variations in performance related to variations in the manner in which cognitive tasks are posed have been observed with respect to a wide range of cognitive tasks that have served as the backbone of efforts to characterize cultural variations in cognitive development by other American psychologists. For example, Patricia Greenfield (1966), in a series of carefully conducted comparisons of children of different ages who did or did not attend school in Senegal, found that many non-schooled children did not acquire the concept of conservation using well known Piagetian tasks. She concluded that schooling is essential to the development of concrete operations. One odd observation in this research was reported by Greenfield: conservation was much more likely to be achieved if children were allowed to pour the liquid themselves instead of observing the experimenter. She speculated that this change in procedure reduced the Wolof children's tendency to interpret the experiment as something of a magic show, but she did not highlight these findings in her conclusions at the time.

Following up on Greenfield’s work among the same population, Judith Irvine (1978) asked her subjects to solve the conservation task and then to play the role of informants whose

¹ It should be noted that Dash and Das (1987) report no differences between schooled and non-schooled Indian children in response to everyday and non-everyday syllogistic reasoning problems but that both schooled and non-schooled subjects “seemed to do poorly when empirical and contingent truths interfered with logical inferences.” (p. 53).

job it was to clarify, *for the experimenter*, the Wolof terms for resemblance and equivalence with respect to the task. When confronted with the critical test in which one beaker of water is poured into a narrower, taller beaker, the Wolof children in the role of subject solving the problem gave the wrong response- they said that the beaker with water higher up its sides contained more liquid. But in their role as "linguistic informants" these same people went on to explain that while level of water was "more" the quantity was the same. Irvine's and Greenfield's results provide nice examples of the kinds of performance factors that can make it appear that children understand less about the underlying question of interest to the psychologist than they actually do. In seeking to interpret these kinds of variability, Cole and his colleagues concluded that cultural variations as well as school-non-school variations, appeared to have more to do with specifics of the problem contents, modes of discourse that frame the problem, etc.) created by the experimental tasks than with the presence or absence of specific cognitive abilities in one group and its absence in the other. It seemed only natural that people who had attended school where the discourse is often about purely hypothetical, often implausible, topics and where learning how to categorize and memorize arbitrary materials are ubiquitous practices, that schooled subjects would realize what was expected of them in the experimental setting. But it did not seem plausible to attribute the observed differences to a generalized shift in modes of thinking from lower, child-like and situation-bound to higher, adult-like, and generally applicable ("context free").

Soviet/Russian scholars have generally been unimpressed by either the methodological arguments or the data offered by their American counterparts, asserting, for example, that there is no empirical basis to think that people without schooling are capable of theoretical thinking (Karpov, 2005). Mescheryakov & Zinchenko (2000) in reviewing Cole's work on this topic, even suggested that his approach should be referred to as "anti-historical" psychology rather than cultural-historical psychology. After all, schooling arose relatively late

in the history of homo sapiens, it is the breeding ground of science and logic, so to deny the historical supremacy of industrialized societies seems absurd.

Interesting evidence of how differently American and Russian scholars approach the issue of culture and logical reasoning comes from a study of syllogistic reasoning among American college students and the reactions to this work by a Russian proponent of Vygotsky's approach. Roy D'Andrade (1989) described a line of research stemming from studies by Paul Wason (1968) in which American college students were presented seemingly straightforward deductive reasoning problems which 80% of the students failed to respond to correctly. The contents of these problems was no obscure, but it was totally arbitrary (the task was to say which of four cards should be turned over to determine if a machine had erred in putting symbols on the backs or fronts of labels). However, if the content of the problem was changed so that it was familiar and meaningful, these same students were overwhelmingly correct.

D'Andrade, who extended Wason's work, concluded that the variations in problem solving he observed depended upon the extent to which the contents were cognitively well structured in terms of local cultural models. Karpov (2005) rejects this line of reasoning, and ascribes the difficulties of the American college students to the failures of the American school system to teach theoretical thinking. This conclusion seems somewhat odd to us because whatever the shortcomings of the American educational system it is difficult to believe that students in leading US universities in the 1990's have not achieved the intellectual level of Uzbeki peasants with 2 years of involvement in schooling and collective farming in the 1930's. This is not the place to decide who is correct. Addressing that question would require a specialized discussion providing a great deal more about the studies in question and relevant comparative data from Russian college. Our point is that the very fact that such arguments can be made indicates the wide gap in ways of interpreting the variations

under discussion and the different orientations to the invocation of context to which they are related.

Development of Children Within a Single Culture

Clear evidence that Russian and American developmental psychologists are using different notions of context also comes from research of developmental change in the US and Europe. Consistent with the generality attributed to the social situation of development in Russian research, Russian psychologists of the cultural-historical school, very much like psychologists who operate within a Piagetian framework, place a strong emphasis on regular, age/social situation-related, developmental stages each manifesting a characteristic mode of thought. By contrast, and the narrower interpretation of the “social situation of development” in the American literature, current American research on children’s cognitive development places a very strong emphasis on the way in which small particulars of the local activity/social situation of development/experimental setting crucially contribute to the manifestation of various capacities.

In American research on children’s intellectual development in recent years, while readily acknowledging that children’s behavior becomes more complexly mediated resulting in higher levels of achievement, has simultaneously emphasized that when great care is taken to place children in situations that make “human sense” to them, they display levels of cognitive development that they do not display in less familiar situations (See Cole, Cole, & Lightfoot, 2004 for a broad sampling of such research). For present purposes, one easily describable experiment of this kind will have to suffice.

Borke (1975) replicated Piaget’s famous three mountain problem, in which children had to say how a diorama scene looked from various perspectives under, two conditions. The first was a replica of Piaget’s own materials: A diorama with three mountains, each distinctive in its appearance. The second was a logically isomorphic diorama with characters

taken from the popular television program, *Sesame Street*, depicting a farm, a lake, and other familiar environmental features. Young children who failed Piaget's version of the task were successful at Borke's version, undermining the idea that young children are generally egocentrically unable to view things from a visual perspective different than their own.

A somewhat different illustration of how familiarity with the objects to be thought about can influence children's apparent level of development comes from a study by de Loache and Brown (1979). They focused on children's ability to remember where an object has been hidden over varying periods of time. In laboratory experiments, young children are notoriously bad at this form of remembering, but when they are asked to remember where a favorite toy was placed many hours previously in their own homes, they show perfect memory for its location (de Loache & Brown, 1979).

Familiarity with the forms of discourse that characterize experiments is also extremely important in determining whether or not children will perform developmentally significant mental actions at the age suggested by norms derived from standard Piagetian stages. A large variety of such examples is to be found in Michael Siegal's work on the forms of conversation embodied in standard conservation experiments (Siegal, 1991).

We do not want to give the impression that there is no mechanism for dealing with variations across contexts/situations/activities in the Russian literature. In one of his late articles, on the role of play in development, Vygotsky (1978) developed the idea of activity in a manner which appears to allow the possibility of synchronic variability. In particular, he hypothesized that play is a "leading" form of activity for pre-school aged children, providing a source of motives and a structure that enable children to behave in a more developed manner than they can when not engaged in play. Play, he wrote, "creates a zone of proximal development of the child, In play a child always beyond his average age, above his daily behavior; in play it is as though he were a head taller than himself (1978, p. 103).

Subsequent research by students of Alexei Leontiev demonstrated this activity-dependent form of synchronic variation in the developmental level of children's behavior by comparing performance on isomorphic tasks in a play or a non-play situation. Manuilenko (1948/2005), for example, asked young children to stand still without moving for as long as possible. When this task was made part of a game in which they were to imagine themselves to be soldiers standing guard at Lenin's tomb, they were able to control themselves and stand still for a significantly longer period than when simply instructed to do so. For older children, the play setting had no effect on their behavior. Many years later, this result was replicated by Ivanova (2000), although she found that play/non-play differences in level of behavior occurred at a younger age than had been true half a century earlier.

Unsurprisingly, a number of experiments that focus on synchronic variation in children's manifest levels of conceptual development also introduce a play element. Thus, for example, Nielsen & Dissanayake (2002) studied children's understand that others can hold and act upon a false belief in both a standard false belief task and in their peer play at pre-school. The children clearly displayed such understanding when at play, but not in the standard experimental situation.

Finally, the effect of the experience accumulated in the course of an experiment itself were long ago demonstrated by Alexander Zaporozhets and his colleagues (Zaporozhets and Lukov, 1941/1979-80). In one such demonstration, preschoolers were asked if different objects would float or sink. They were then given, for example, a tin toy shovel, asked whether it would float (they said, "yes") and then allowed to test their prediction. Because the toy shovel was placed carefully on the water, it floated. Subsequently they were given a series of metal objects, non of which floated. When then given the tin shovel they declared that it would sink. When it floated, they denied it was floating! Eventually, given many contrasting examples, they began to generalize correctly about which objects would float and

which would not. The interpretation of these results may be disputable. But the influence of the child's experience in the course of the experiment, the "context," is not.

Synchronic Variation Reconsidered

Vygotsky's proposal that play constitutes a unique form of activity that is a special source of motives for children's thinking and acting in early childhood was part of a larger proposal to re-conceive the idea of stages of children's development in relation to the "leading activity" that corresponded to children's age rather than to entirely "inside the head" stage theories of the sort offered by Piaget. This proposal provides a potential bridge between Russian cultural-historical developmental theory and approaches placing heavy emphasis on synchronic variability deriving from non-Russian developmentalists sympathetic to Vygotsky's ideas. However, as currently formulated, the Russian proposal, in the same spirit as the notion of "social situation of development" tends to assume that there is an invariant sequences of leading activities and that only a single kind of activity can play a leading role in organizing cognitive performance at a given time. Here we offer two examples, one empirical from American research, one from comments that Vygotsky made about the heterogeneity of manifest conceptual abilities, to suggest the possibility that multiple forms of activity (and modes of conception) can co-exist in the same persons in the course of time spans too brief to be considered as candidates for general changes in stages of development. We then complete our discussion with some remarks on ways to promote more inclusive conceptual agreement and to pinpoint areas in need of closer scrutiny.

Heterogeneity of "Leading" Activity in the Course of a Single Game Episode

The following example is a description by an undergraduate in a child development field course playing a computer game, "Mystery House" with two girls, Jamie (age 8) and Lisa (age 6) (See Cole & Subbotsky, 1993 for more extended treatment). This game was one

of many choices of activities for the children as a part of a special afterschool program called, The Fifth Dimension (See Cole & The Distributed Literacy Consortium, 2006). The computer on which the game was implemented is now quite outdated. Its graphics were primitive, and all commands were entered by typing simple two word instructions. Players entered a house where mysterious things happened including lights going out and people dying at the hands of a murderer. The object of the game was to discover who the murder was.

The conventions for writing the fieldnotes included the requirement to write about the writer's moods and thoughts at the start of the session and as detailed an account as possible. Several "leading" activities were potentially present, each associated with different age periods: Affiliation, the need to be loved and accepted; play; learning; peer interaction, and work (at least on the part of the undergraduate). The fieldnote begins as the undergraduate meets up with the 8 year old.

Fieldnotes by Jill S

Right away I was anxious to get started since I knew that Jamie had been looking forward to working with me again after last Thursday. But this day was special...it started out different and ended up being one of the greatest experiences of my life. Never before have I exerted so much energy in the fifth dimension... Leaving the library I was wiped out but really felt liked I made a difference in two beautiful children's lives. Actually I went home to sleep for hours. WOW was it worth the extra energy!

And the reason for this sudden burst of energy came from the fact that Jamie requested me as her partner. I don't know why this meant so much to me but I guess it was because I wasn't quite sure the kids were liking me. [*Appearance of affiliation as central motive*]. First thing Jamie tells me that Lisa her sister was going to play with us "a little" since she really was not in the mood to play full out. Jamie acted very motherly and quite protective of Lisa.

She made sure that I understood that Lisa would not be a big part of our team. This was a great opportunity to give Lisa, only 6, freedom to do or not to do.

As we get started with Mystery House, Lisa sits back and observes, but the minute I explained to them the purpose of the game, the objectives and strategies, she piped up her ears and got into it. After the first five minutes or so, Lisa was full-fledged into the game and we couldn't have progressed through the different rooms of the house without her help. [*Play becomes the leading activity for children*]

All three of us were stunned when we realized that the reason we couldn't go and look in the refrigerator because the computer would not eat our command to "look Refrigerator" – UNTIL we wrote "GO TO REFRIGERATOR". This made all three of us stop and think, HMMM, why can't we look there?? AHAAAA! We must GOOOOOOO there first, then we can look. [*Adult enters into play with children, learning enters as a motive*].

Here are some of the goals we had, when we started the game... We should try to get through as many rooms of the first floor of the house and collect as many objects on our way as possible, while at the same time, staying away from the "masked killer" who was somewhere roaming the house. But we were also looking for the killer at the same time, so this in turn affected our decisions about what to gather as we ventured through the house. For example, when a knife was lying in the kitchen sink, we grabbed it! For protection of course.

The children really rely on the pictures on the screen [*Adult engaging in analytic work in the course of playing*]. I say this because two times, the picture affected our next step. For example, Lisa saw the stove in the kitchen as one that was "never looking" and thus, didn't need to be lit by matches. Rather she informed me that it was "not an old fashioned stove and that her mom doesn't have the kind that needs matches any more." So, when I suggested that we light the stove for some light, the first reaction Jamie had was that it was a bad idea because the house could catch on fire if we lit the stove and then left the kitchen to search

other rooms. Lisa also thought my idea wasn't a good one because of the fact that the stove looked like an electric range (as opposed to gas). [*Logical reasoning and inference by six year old in context of play*]

So we went with Lisa's idea and kept our eyes open for a candle. When that candle finally turned up, you wouldn't believe how excited they got!!!! It was as if they accomplished so much. [*Children are now deeply involved in play*]

The game doesn't count matches, and we couldn't actually gone through the whole day lighting matches time after time that the lights shut off, but they both realized that there was a more efficient way of doing things, and they could save a lot of time with a permanent time source. Plus, I think Lisa was getting really scared. She said, "Jill, I hope that lights don't go out again, I hate the dark. And what if the killer sneaks up behind us when the lights go off?" [*Border between fantasy play and real life becomes obscured*]

I could really go on and on about the amazing interaction that took place between all three of us. But I want to illuminate one more incident that took place which really stood out in my head. We are outside in the back porch of the "Mystery House" and we adventurously risked going through the gate. It was as if we were actually tiptoeing through this scary place always in the lookout for the killer. Lisa was so scared but having fun at the same time. Anyways we find ourselves in the graveyard and instead of there being a dead body lying there, as we had found in most of the other rooms, there was a live person digging graves!!!!!!!!!!

But as we are thinking about what to do with the gravedigger—should we kill him with the knife we got or should we talk to him or should we sneak away without him seeing us and go get the dagger and come back later and kill him???—I ask them why they think he is the killer and not just an innocent bystander.

Jamie: Well, why is he alive if he's not the killer?

Lisa: Plus why won't he talk to us?

Jamie: He looks pretty suspicious to me.

Me: You can't always tell things that easily. He may be innocent.

Lisa: Well why is he digging six graves then? He obviously knows that sic people will die and he's preparing to bury them.

Jamie: That has to be him. UNLESSSSS, the killer asked him to dig the graves as a favour!!!!

Lisa: That would mean that Joe (gravedigger) knows who the killer is!

Jamie: Maybe Joe's friends with the killer.

Lisa: We should kill him.

Jamie: Yeah either way he's bad.

[Logical reasoning by two young children and adult in the midst of the fantasy]

So they both looked to me for final approval and I made sure they understood that they were risking getting killed since all they had to kill him was a butterknife. So we decided to get another weapon and come back.

As this example makes clear, not only are the girls able to a "head taller" but a "head shorter" in the course a single stretch of joint game play mediated by the computer game and each other.

Heterogeneity in Level of Adult Conceptual Thought: Toward Convergence

From the forgoing discussion, we hope we have made the case that, in principle, context (despite the ambiguities in its various usages) plays a role in both Russian, Vygotskian conceptions of human thought as well as in the formulations of their American admirers. While emphases differ (American researchers appear to place more emphasis on demonstrations of synchronic variability associated with variations in

context/situation/activity while Russian researchers place a greater emphasis on diachronic, developmental, change) both groups are wrestling with the issue of how to achieve a more systematic approach to understanding of thought and its development, both historically and ontogenetically. We close by citing two clear statements from the Russian tradition which signal this point of essential agreement.

First, the words of L.S. Vygotsky from his monograph, *Thought and Language* concerning synchronic variability- in this case with respect to the level of conceptual development manifested by adults:

However, these processes of transition [towards thinking in concepts] are not mechanical processes, where each new phase begins only with the completion of the previous one. The developmental process is much more complex. *The various genetic forms co-exist*, just as strata representing different geological epochs coexist in the earth's crust. This is more the rule than the exception for the development of behavior generally. Human behavior is not consistently characterized by a single higher level of development. Forms of behavior that emerge very recently in human history dwell alongside the most ancient. The same can be said about of the development of the child's thinking. A child who mastered higher forms of thinking, a child who mastered concepts, does not part with the more elementary forms of thinking. In quantitative terms, these more elementary forms continue to predominate in many domains of experience for a long time. As we noted earlier, even adults often fail to think in concepts. The adult's thinking is often carried out at the level of complexes, and sometimes sinks to even more primitive levels. When applied in the domain of life experience, even the concepts of adults and adolescents frequently

fail to rise higher than the level of pseudoconcept. They may possess all the features of the concepts from the perspective of formal logic, but from the perspective of dialectical logic they are nothing more than general representations, nothing more than complexes. (1997, p. 160).

Second, the words of Peeter Tulviste, an Estonian student of Alexander Luria's concerning synchronic variability associated with cultural history based upon his cross-cultural research on syllogistic reasoning:

there is an obvious connection between various forms of activity and the heterogeneity of thinking. This is true between and within cultures. The reason for the heterogeneity of verbal thinking must not be sought in the accidental preservation in society or in the individual of "old," "lower," or "previous sociohistorical or ontogenetic stages of thinking. Instead, it must be sought in the multiplicity of activities that are distributed in society and carried out by the individual. Heterogeneity developed through social history such that with the development of material and mental production new forms of activity appeared. These new forms of activity required new types of thinking and gave rise to them. At the same time, to the degree that earlier forms of activity, which fulfill some role in the society, are preserved, the "old" types of thinking that correspond to them are preserved and continue to function (Tulviste, 1986, pp. 24-25).

The current challenge facing those concerned with understanding the relation of thought and its development to its context is to resolve the residual uncertainties of the past by formulating in clear and consistent terms the specific references of their use of the term "context," how the use of this term relates to their notion of activity, situation, and environment, and how research focusing on cultural-historical and ontogenetic change can most fruitfully be brought into alignment with each other.

References

- Barkhudarov, S.G. et al.(1958). *Dictionary of the Russian Language*. Moscow: State Publishing House of Foreign and National Dictionaries.(in Russian)
- Borke, H. (1975). Piaget's mountains revisited: Changes in the egocentric landscape. *Developmental Psychology*. 11(2),240-243.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.
- Cole, M. (1988) Cross-cultural research in the sociohistorical tradition. *Human Development*, 31, 137-151.
- Cole, M. (1996). *Cultural psychology: A once and future discipline*. Cambridge, MA: Harvard University Press.
- Cole, M. & The Distributed Literacy Consortium (2006). *The Fifth Dimension: An after-school program built on diversity*. New York: Russell Sage.
- Cole, M., Gay, J., Glick, J.A., & Sharp, D.W. (1971). *The cultural context of learning and thinking*. New York: Basic Books.
- Cole, M. & Gajdamaschko, N. (2007). Vygotsky and culture. In H.J. Daniels, M. Cole, & J. Wertsch (Eds.). *Cambridge Companion to Vygotsky*. New York, N.Y.: Cambridge University Press.

Cole, M. & Subbotsky, E. (1993). The fate of stages past: Reflections on the heterogeneity of thinking from the perspective of cultural-historical psychology. *Revue Suisse de Psychologie*, 52 (2), 103-113.

D'Andrade, R. G. (1989). Culturally based reasoning. In A. Gellatly, D. Rogers, & J.A. Sloboda (Eds.). *Cognition and social worlds*. New York, NY, US: Clarendon Press/Oxford University Press. (pp. 132-143).

Das, J.P., & Dash, U.N. (1990). Schooling, literacy, and cognitive development. In C.K. Leong and B.S. Randhawa (Eds.), *Understanding literacy and cognition: Theory, research, and application*. New York: Plenum.

de loache, J. & Brown, A. (1979). Looking for big bird. *Quarterly Newsletter of the Laboratory of Comparative Human Cognition*.

Dias, M.G. & Harris, P.L. (1988). The effect of make-believe play on deductive reasoning *British Journal of Developmental Psychology*, 6(3), 207-221.

Dias, M. Roazzi, A., & Harris, P.L (2005). Reasoning From Unfamiliar Premises: A Study With Unschooled Adults. *Psychological Science*. 16(7), 550-554.

Greenfield, P.M. (1966). On culture and conservation. In J. S. Bruner, R. P. Olver, & P. M. Greenfield (Eds.), *Studies in cognitive growth*. New York: Wiley.

Irvine, J. (1978). Wolof "Magical thinking: Culture and conservation revisited." *Journal of Cross-Cultural Psychology*, 9.

Ivanova, F.F. (2000). The development of voluntary behavior in preschoolers: Repetition of Z.V. Manuilenko's experiments. *Journal of Russian & East European Psychology*. 38(2), 6-21.

Karpov, Y.V. (2005). *The neo-Vygotskian approach to child development*. New York: Cambridge University Press.

Kozulin, A., Gindis, B. Ageyev, V.S. & Miller, S.M. (Eds.) (2003). *Vygotsky's educational theory in cultural context*. Cambridge, UK : Cambridge University Press.

Luria, A.R. (1976). *Cognitive development: Its cultural and social foundations*. Cambridge, MA: Harvard University Press.

Manuilenko, Z.V. (1948/2005) Razvitie proizvol'nogo povedeniia u detei doshkol'nogo vozrasta; Manuilenko, S.V. *Izvestiia APN RSFSR*; 1948, p14, 1p.

McDermott, R. P. (1983). The acquisition of a child by a learning disability. In S. Chaiklin & J. Lave (Eds.), *Understanding practice: Perspectives on activity and context*. New York: Cambridge University Press.

Mescheryakov & Zinchenko (2000). L.S. Vygotsky and contemporary cultural-historical psychology (critical analysis of the book by M. Cole). *Voprosi Psikhologii*, ??, (2). 102-105.

Nielsen, M., & Dissanayake, C. (2000). An investigation of pretend play, mental state terms and false belief understanding: In search of a metarepresentational link. *British Journal of Developmental Psychology*. 18(4), 609-624.

Scribner, S. (1977). Modes of thinking and ways of speaking: Culture and logic reconsidered, In P.N.Johnsonnn-Laird and P.C. Wason (Eds.), *Thinking: Readings in cognitive science*. Cambridge: Cambridge University Press.

Scribner, S. & Cole, M. (1981). *The psychology of literacy*. Cambridge, MA: Harvard University Press.

Siegal, M.(1991). *Knowing children: Experiments in conversation and cognition*. Hillsdale, NJ: Erlbaum.

Tulviste, P. (1986). Ob istoricheskoi getergennosti verbal'nogo myshleniya (The historical heterogeneity of verbal thinking). In Y.A. Ponomarev (ed.). *Myshlenie, obshchenie, praktiki: Sbornik nauchnykh trudov* (Thinking, communication, practice: A collection of scientific works). Yaroslavl: Yaroslavl Pedagogical Institute.

Tulviste, P. (1991). *The cultural-historical development of verbal thinking*. Commack, NY: Nova Sciences Publishers.

Wertsch, J.V. (1985). *Vygotsky and the social formation of mind*. Cambridge, MA: Harvard University Press.

Wertsch, J.V. (1991). *Volices of the mind*. Cambridge, MA: Harvard University Press.

Winegar, L.T. & Valsiner, J. (Eds.) (1992). *Children's Development Within Social Context*. Hillsdale, N.J. : Erlbaum.

Vygotsky, L.S. (1934/1994). Fascism in neuropsychology. In R. Van der Veer & J. Valsiner (Eds.), *The Vygotsky Reader*. Oxford: Blackwell.

Vygotsky, L.S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.

Vygotsky, L.S. (1981). The genesis of higher mental functions. In J.V. Wertsch (Ed.), *The concept of activity in Soviet psychology*. Armonk, NY: M.E. Sharpe.

Vygotsky, L.S. (1998). *Problems of child (developmental) psychology*. In R. W. Rieber, M. J. Hall, & J. Glick (Eds). *The collected works of L.S. Vygotsky: Volume 5: Child psychology*. New York: Plenum.

Vygotsky, L.S. (1929). The problem of the cultural development of the child, II. *Journal of Genetic Psychology*, 36, 414-434.

Vygotsky, L.S. (1934/1994). Fascism in neuropsychology. In R. Van der Veer & J. Valsiner (Eds.), *The Vygotsky Reader*. Oxford: Blackwell., pp. 326-337.

Vygotsky, L.S. & Luria, A.R. (1930/1994). Tool and symbol in child development. In, R. van der Veer & J. Valsiner (Eds.). *The Vygotsky reader*. Oxford: Blackwells., pp. 99-174.

Vygotsky, L.S., & Luria, A.R. (1930/1993). *Studies on the history of behavior: Ape, primitive, and child*. Hillsdale, NJ: Erlbaum.

Wason, P.L. (1968). Reasoning about a rule. *Quarterly Journal of Experimental Psychology*, 20(3), 273-281.

Wertsch, J. (1991). *Voices of the Mind*. Cambridge, MA: Harvard University Press.

Wertsch, J. (2000). Communication: An arena of development. In N. Budwig, I.C. Uzgiris, I.C. & J.V. Wertsch, (Eds). *Advances in applied developmental psychology*. Westport, CT, US: Ablex Publishing.

Winegar, L.T. & Valsiner, J. (Eds.) (1992). *Children's Development Within Social Context*. Hillsdale, N.J. : Erlbaum.

Wozniak, R.H (1992). Co-constructive, intersubjective realism: Metatheory in developmental psychology. In W. Kurtines, M. Azmitia, & J. Gewirtz(Eds). *The role of values in psychology and human development*. Oxford, UK: Wiley. pp. (pp. 89-104)

Zaporozhets, A.V. & Lukov, U.D. (1941/1979-80). The development of reasoning in young children. *Soviet Psychology*, 18 (2), 47-66.