Embracing History through Transforming It: Contrasting Piagetian versus Vygotskian (Activity) Theories of Learning and Development to Expand Constructivism within a Dialectical View of History

Eduardo Vianna and Anna Stetsenko

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What is This?
Embracing History through Transforming It
Contrasting Piagetian versus Vygotskian (Activity) Theories of Learning and Development to Expand Constructivism within a Dialectical View of History

Eduardo Vianna and Anna Stetsenko
The City University of New York

ABSTRACT. This paper contrasts the notions of learning, teaching and development as these are conceptualized in two versions of constructivism: the socio-interactional one (in which Piagetian and Vygotskian insights are often merged) versus the one founded by Vygotsky and expanded in activity theory (especially by Galperin and Davydov). We reveal a broad conceptual commonality that makes these frameworks compatible at one level, but draw profound contrasts in their premises concerning history (including cultural tools) and the concept of the social. Examples of educational practices (including results of our own year-long observation) are used to illustrate implications of these premises. We argue that the Vygotskian framework expanded by a dialectical view of history can be used to devise education that takes history to the fullest and yet does not fall into the traps of a conservative agenda with its two extremes of unidirectional authoritarianism or laissez-faire individualism. It is on this foundation that a coherent and unified constructivist approach committed to ideals of social justice can be construed in the future.

KEY WORDS: constructivism, cultural-historical activity theory, education, Piaget, tools, Vygotsky, zone of proximal development

Constructivism represents a heterogeneous body of theoretical approaches across different disciplines that has forged diverse alliances, as well as both attracted and antagonized vast audiences within these disciplines, including psychology and education. The importance of discussing the gist and implications of this broad perspective in its different guises is hard to overestimate. This importance is not merely academic but has practical consequences, particularly stark in the present political climate. It is in view of the mounting challenges from the increasingly conservative and positivist landscape in society and science (especially in psychology and education)
that a strong, coherent and inclusive (though not indiscriminately) constructivist framework of human development is much needed. Such a framework, in our view, can be construed on the basis of dialectical (i.e. contextualized, dynamical, relational and non-essentialist) views of social and psychological processes, including the view of history as a continuous flux of social practices, to which each new generation contributes, while inevitably transforming it. This framework could provide a viable alternative to the increasingly dominant reductionist approaches in psychology that focus on information processing in an isolated ‘mental realm’ of the brain, and are directly affiliated with positivist, non-dialectical and ultimately conservative approaches in education.

The existing diversity of constructivist theories and approaches, ranging from radical forms of social constructionism (see Gergen, 1994), distributed cognition and situated learning perspectives to cognitive constructivism stemming from Piaget, to Vygotsky’s cultural-historical theory, often clouds the underlying common foundation and potential of this framework. Without disentangling such a common foundation, the differences between these approaches inevitably remain, to a degree, murky. As a result, constructivist scholars often talk past each other, and this framework appears to be, especially to educationalists, ‘a complex, multifaceted, and somewhat indefinable doctrine’ (Mayer, 2004, p. 18). Moreover, through contrasting it with evidence-based arguments, constructivism is then de facto dismissed as an ever-shifting ideology unable to produce tenable results.

The goal of this paper is to join the ongoing discussions on constructivism in an effort to contribute to the veracity and coherence of this framework by focusing on one missing piece in its puzzle. This piece concerns the deep-seated and sharply contrasting assumptions, especially prominent in Piagetian and Vygotskian theories, about the role of history in human development, closely associated with a view of the social dimension or of ‘what’ (and who) develops in human development (and a number of other concepts). Whereas Piaget, though only implicitly, portrays history as a passé that is completed and fixed, something that is ‘done with’, finished and practically irrelevant in the present, Vygotsky places history at the center-stage of his whole approach. Moreover, Vygotsky lays foundations for a dialectical view of history as an ongoing fluid and dynamic process that is always here in the present, existing in the unending and ever-expanding dynamic layering of social practices in which the past and the present interpenetrate each other.¹ These assumptions of a philosophical level, though not explicated in the ongoing discussions of Piaget and Vygotsky (and, to the best of our knowledge, in the recent ones on constructivism at large), do find their way into related psychological conceptions of mind and knowledge, of learning and development, and do have practical implications in education.

Explicating these differing assumptions in Piagetian and Vygotskian
frameworks is possible by revealing their underlying commonality as rooted in the view of action as the source of development. The first part of this paper is devoted to this two-fold analysis of commonalities and differences between Piaget and Vygotsky. This analysis is expanded, in the next part, by addressing how varying philosophical and theoretical assumptions determine approaches to teaching and learning in present-day versions of constructivism and are also co-determined by these practices in a dialectical process of mutual penetration of theory and practice.

While addressing the educational implications of Piaget and Vygotsky, we focus on two versions of constructivism that can be termed (a) socio-interactional constructivism, firmly rooted in a Piagetian framework (and sometimes merged with Vygotskian ideas) as now broadly implemented in school curricula across the United States, versus (b) cultural-historical, activity-based constructivism, stemming from Vygotskian theory as expanded in education by his colleagues and followers (Galperin, Davydov and others) within the activity theory tradition. We offer examples of classroom practices (including results of a year-long observation) that typify these two versions of constructivism.

By addressing broad theoretical assumptions of Piaget and Vygotsky (which are, after all, theories of the past) in the spirit of embracing and transforming these theories, and viewing them through the lenses of their educational implications in present-day schooling practices, we are, we believe, engaged in a type of analysis that itself embodies (although certainly does not exhaust) the very concept of history that we purport to explicate. Because our approach also implicates the reverse analysis of understanding educational practices through the lenses of their theoretical foundations, it further appears to be consistent with the notion of mutual co-determination of theory and practice outlined by Vygotsky (1997b) in his seminal work on the historical crisis in psychology and embodied in his own life. On the whole, we hope that this analysis will contribute, on some scale, to the monumental (certainly beyond the scope of this paper) task of fusing the now disconnected branches of constructivism in a unified conceptual framework. Solving such a task, which is probably out of reach today, calls for collaborative efforts of scholars with a common set of commitments to dialectical, non-essentialist and ultimately democratic psychology and education rooted in ideals of social justice and equality.

Theories of Development and Learning by Vygotsky and Piaget as Two Versions of Constructivism

Common Foundations of Constructivism

Constructivism is not often used as a generic term to describe theoretical approaches developed in sociology, psychology, political sciences, education
and other social sciences. Representatives of social constructionism, for example, rarely engage in dialogues with Piagetian cognitive constructivism, and Vygotsky’s cultural-historical theory is typically perceived as a framework that emphasizes the social origins of mind and has little to do with constructivism (although exceptions exist and will be analyzed in the following sections). This broad family of theoretical approaches, however, has a solid grounding in a number of foundational principles with clear theoretical boundaries, and revealing them can help to dismantle the often artificial barriers among them, thus inviting a dialogue.

Perhaps the broadest foundational premise characteristic of constructivism, in any of its guises, is that it challenges traditional and essentialist concepts of social phenomena as being ‘thing-like’ products of a solitary and self-contained individual endowed with an internal machinery of cognitive skills that only awaits the right conditions to unfold. Constructivism moves away from such essentialist and context-independent notions of psychological processes (e.g. dispositions, personality traits, intelligence, etc.) toward the transactional view (see Altman & Rogoff, 1987) of social and psychological phenomena as processes embedded and co-constructed within contexts and intrinsically interwoven with them.

One prominent line of constructivist approaches is based on the centrality of human action in the emergence of social reality and can be termed psychological constructivism. This line of theories focuses on the centrality of psychological processes and human subjectivity in the production of both human development and social processes—in contradistinction to social constructionism, which focuses on societal-level transactions as the ultimate level of analysis and regards human subjectivity as fleeting products of powerful social forces, especially discourse (e.g. Gergen, 1994; for further discussion, see Dunn, 1997; Holland, 1997; Stetsenko & Arievitch, 1997). A broad family of otherwise dissimilar theories falls under the (so construed) category of psychological constructivism, including those by Piaget and Vygotsky (as well as Dewey, whom we leave aside in the present analysis). Although these theorists often have been presented along the lines of conceptual contrasts among them, more recent analysis has moved in the direction of acknowledging their broad similarity (e.g. Cobb & Yackel, 1998; Cole & Wertsch, 1996; DeVries, 2000; Hatano, 1993; Stetsenko, 2002). Our analysis, in this sense, continues such an approach to Piaget and Vygotsky, although it predicates itself on a set of different assumptions, discussed below.

Both Piagetian and Vygotskian approaches, as psychological constructivist theories, represent and embody the transactional, relational and contextualized modes of thinking about human development. First, these theories place human action, understood as a specification of the transactional reality between persons and the world, subjects and objects, at the
foundation of their analysis. The growth of human action, in its increasingly complex transformations, and as something that takes place in the world and not just in the head, is considered to be the origin of psychological phenomena, with the latter appearing as part and parcel of ongoing actions that individuals perform in life. Mind, for both Piaget and Vygotsky, is not a container that stores memories and knowledge but, rather, represents a dynamic system formed and expressed in actions.

Second, because of the emphasis on human action as it develops in the world, within changing contexts, all versions of psychological constructivism are de facto contextualist: none of them completely ignores sociocultural and relational dimensions of human development. For example, social interaction involving cooperation, collaborative problem-solving, conflict and communication is important in theories by both Piaget and Vygotsky. In addition, because development is a contextually embedded process of interactions, it is not pre-programmed; innate, blueprinted mechanisms are by definition inappropriate for tackling the tasks imposed by an emergent, constantly changing reality of humans acting in contexts. It is here that Piaget and Vygotsky stand together in opposition to reductionistically innatist (i.e. Chomsky) or mechanistically mentalist (i.e. many in the mainstream cognitivism) frameworks.

Third, all action-centered theories implicate growth through increasing elaborateness of actions and thus inevitably concern themselves with the issues of learning and development (although much more directly in Vygotsky than Piaget). Here too, Vygotsky and Piaget converge in that they both imply that children learn through acting in the environment. This view places Piaget and Vygotsky in opposition to traditional views of mind as a passive container of knowledge and of learning as a process of acquiring fixed knowledge (facts and information) that are thought to exist independently of human activity. Delineating these similarities is important for a number of reasons, one being that it sets the stage for an analysis very different from the one conducted when we disregard the common grounding of Piaget and Vygotsky in the notion of action-in-context as the origin of mind (the latter type of analysis is very common; for a recent example, see DeVries, 2000).

More importantly, taking into account this common grounding allows a more targeted juxtaposition and ultimately contrast of these theoretical frameworks. Namely, it allows to see that, certain commonalities between Piaget and Vygotsky notwithstanding, the meaning ascribed to the notions of action and environment as well as how and why actions are conceptualized to evolve differ radically in their frameworks. This results in (and simultaneously stems from, in a co-deterministic way) their drastically diverging conceptions of culture, history, social practice and tools, and, ultimately, of what (or who) develops in human development.
Piaget versus Vygotsky on the Essence of Humanness and the Social

The foundational difference between Piaget and Vygotsky rests in their views on the very nature of human life, that is, the essence of humanness. This difference has to do with Piaget’s roots in the biological mode of thinking that developed after Darwin, on the grounds of his insights about evolution—roots that are a whole world apart from Vygotsky’s in the Marxist tradition, which represented the next important step after Darwin (integrating his approach and superseding it) in the broad modes of thinking about nature, society and human development. Vygotsky’s embeddedness in Marxist thought, though overlooked in traditional accounts in the West, has been a common reference point in Russian psychology and, perceived as obvious, was neither mentioned nor elaborated sufficiently (‘omitted by default’). It has also been highlighted by a number of authors in the West, instigating important changes in traditional views of Vygotsky (especially by Newman & Holzman, 1993, who have inspired many Western scholars to ‘notice’ Marx in Vygotsky; more recently by Elhamoumi, 2002; Jones, 2002; Ratner, 2000). There is a need, however, to continue elaborating the implications of Vygotsky’s Marxist roots for various aspects of his approach, such as that on learning and development, and here we offer steps in this direction.

Whereas Piaget is firmly grounded in a biological worldview and postulates the essence of human development in the adaptation to environment, Vygotsky (following Marx and Engels) capitalizes on the centrality of transformative collaborative practices by people who do not adapt to their world but collectively transform it, and, through this transformation, also change themselves and gain their own status and their essence, which also appears as ineluctably social (i.e. collaborative and collective; see Vygotsky, 1997a, 1997b, 1997c, 1999). This point of view, both in Marxism and in Vygotsky’s approach, was not merely proclaimed but elaborated in great detail and supported by evidence from diverse sources, ranging from phylogeny and anthropogenesis to the development of human civilization. Perhaps the most important meaning of what is Marxist in Vygotskian theory is its emphasis on the centrality of transformative collaborative practices in human development; here too lies the contribution of Vygotsky and his collaborators (such as Leontiev, 1978) to Marxism—in the sense of them bringing this idea to the fore in research on ontogenetic development and teaching–learning, which had not been done consistently by Marx.

That is, for Piaget, children develop, learn and achieve knowledge—all in the spirit of adapting to existing conditions in order to ‘fit in’ better with them and the environment as a whole. Accordingly, mind and knowledge, evolving out of actions through which people adapt to the world, are also profoundly saturated by the goals and processes of adaptation.
For Vygotsky, on the contrary, children develop and learn as they actively change the world they live in, simultaneously changing themselves and gaining knowledge of themselves and of the world through changing the world—all in the process of transformative collaborative practices with other people (very clearly explained in his *Tool and sign* [Vygotsky, 1999; see Stetsenko, 2004]).

In this sense, the development of each and every human being, including the development of mind as originating from actions and intrinsically connected with them, can be viewed as a participation in, instantiation (performing) of and contribution to the ongoing collaborative transformative practices of people, that is, to culture and society itself. Accordingly, mind and knowledge, for Vygotsky, can be said to essentially emerge out of, within and through collaborative transformative practices and represent just one form (or mode) in which these practices exist (though not explicitly).

This profound difference between Piaget and Vygotsky along the lines of adaptation versus transformation, although it might sound a rather abstract matter, in fact gets directly channeled into the more specific views of the two scholars, including their implications about teaching, learning and development.

For one, this difference is reflected in what has been aptly termed ‘a weak image of the role of social life’ in the Piagetian framework (Lerman, 2000, p. 210). Namely, Piaget, while acknowledging that an individual child develops in society and that his or her actions, lying at the basis of knowledge, are affected by society (through cooperation and conflict with other people), excludes the historical heritage of previous generations, accumulated and embodied in cultural forms: for example, in knowledge and language that pre-exist the individual on the external plane (see, e.g., Cole & Wertsch, 1996; Lerman, 2000). For Vygotsky, on the contrary, the central idea is that of the cultural mediation of action and the associated emphasis on action itself being inherently and ineluctably social, rather than merely influenced by society, as in Piagetian theory. In this sense, for Vygotsky, children develop not through their own actions under the condition of interaction but through socially distributed (to use contemporary terms) interactions and essentially due to transferrals from the inter-individual to the intra-individual plane, from the social to the individual, in collaborative activities with other people.\(^5\)

A related difference in implications, again pertaining to the meaning of the social dimension of development, is clearly articulated in those works in the Vygotskian tradition that view development as participation in communities of practice (Lave & Wenger, 1991; Rogoff, 1990). Here the emphasis is placed on the child developing in communities, through participation in collaborative activities with others. It is through immersion in practices of each given community that children develop and learn. This view is pointedly contrasted with the Piagetian focus on the child as developing
alone, through his or her own actions, though within the context of environmental influences.\(^6\)

The two described conceptual differences concerning the meaning of the social in Piaget and Vygotsky are well captured in many recently developed conceptualizations of Vygotsky, especially in the area of education. This is particularly evident in recent shifts toward broader and more dynamic (as well as more social) conceptualizations of the notions of the zone of proximal development (ZPD), meaning-making, collaborative discourse and scaffolding (e.g. Chang-Wells & Wells, 1993; Cobb, 1998; Nunes, 1999; Tharp & Gallimore, 1988; Whitmore & Goodman, 1995). For example, researchers have moved from seeing the ZPD as just another testing procedure in the ‘skills’ interpretation of this concept, to seeing it as a collective process and interactive space in which social transformation takes place (e.g. Holzman, 1999; Kramsch, 2000; Moll & Whitmore, 1993; Wells, 1999; for a review of this shift in its broad implications and underpinnings, see Kinginger, 2002).

However, the proposition about the role of the cultural heritage, culture itself as something that pre-exists each individual child, has remained difficult and divisive for scholars in the Vygotskian tradition.

The Vygotskian/Dialectical View on History and Culture

For many progressive psychologists and educators, capitalizing on the notion of cultural heritage and on its role in development is associated with conservative ideas of passive transmission and inculcation of knowledge into students’ minds. Indeed, if culture is conceived of as a fixed and inert body of knowledge (a repository of facts and skills), and history as a unidirectional process of discrete episodes in which the past and the present are disconnected (as appears to be the case of Piaget; cf. Perret-Clermont, 1996), then any talk about culture and its tools indeed leads into authoritarian discourse and practice.

Yet the proposition about the central role of culture and history in development and learning simply cannot be excluded from Vygotsky’s theory, which is after all termed by its author cultural-historical theory, with this role continuing to puzzle many in today’s discussions. Is he inviting us into the authoritarian, unidirectional type of psychology and education by putting emphasis, again and again, on teaching–learning\(^7\) as the process that leads development, on cultural tools and scientific concepts as instruments of mind, and on internalization as the mechanism of development and learning? How can these views be reconciled with his freedom-loving, and freedom-seeking, revolutionary spirit, his emphasis on transformative social practices as central in development and on people being agents of their life, development and history itself (Vygotsky, 1997a, 1997b, 1997c, 1999)?
This puzzle, in our view, can be resolved if we assume that Vygotsky operated (though not explicitly, cf. Stetsenko & Arievitch, 2004) with a truly dialectical notion of history and culture, which now needs to be elaborated in line with the overall gist of his theory and his idea about collaborative transformative practices. Such elaboration entails at least the following.

First, we need to conceptualize culture not as a collection of inert (dead) artifacts but as a living continuous flow of practices that stretch throughout history and are enacted by each generation of people. This essentially Marxist conceptualization was obviously present in Vygotsky’s own writings but pursued with particular rigor by Ilyenkov (1977) in his theory of ideal forms and taken up by Leontiev and Luria (although not without some contradictions).

Second, we need to abandon the notions not only of the child as a ‘solitary actor’ who develops essentially individually (the goal that Vygotsky helped to achieve), but also of each generation being separate from the rest of humanity and from history, as if acting in a historical vacuum and inventing itself and its world each time from scratch. Instead, we need to conceive of the present generations as joining in and continuing the practices of past generations, including transforming (necessarily) and even breaking away from these past practices—in the dialectical notion of breaking away as a process entailing in itself that which it breaks with, albeit in a negated form. This has to do with the dialectical notion of history and time as being a continuous flow, in which the past, the present and the future are blended and always contained in each other. In this sense, the present contains the past within it, but not mechanistically as a simple additive inclusion. Rather, the present is an enactment of the past that transforms the past but also inevitably carries it on, in superseded and often negated (opposite) forms, into the future.

The third and connected re-conceptualization has to do with viewing local communities as being not separate entities with clear borders but, instead, as belonging together and interpenetrating each other on the global scale, interacting and influencing each other in numerous ways. This last point becomes particularly evident today, whereas it was probably somewhat less relevant in Vygotsky’s times.

Taken together, the conceptualizations along these three lines shed a new light on the meaning of the social in development and learning, and the difference between Piaget and Vygotsky. Namely, for Piaget, what develops is the individual child acting in the environment (other people not excluded), whereas for many of today’s Vygotskian approaches what develops is the community and the patterns of participation in it or the mother–child dyad. In what we believe to be a Vygotskian spirit, neither is a full answer because neither takes history and culture to the fullest, that is, dialectically. In our view, the Vygotskian answer is that at the center of development is simultaneously the child and humanity (as a child-and-humanity unity), that
is, the child who develops through actions that contribute to (not just participate in) the collaborative practices of humanity (not just of local communities here and now), with these practices simultaneously co-emerging through the child and his or her contributions, thus also being the site of development. In other words, it is the co-emerging development of the child through and in humanity as well as of humanity through and in each individual child that represents the ‘what’ of development, where humanity is understood as the never-ending, ongoing, continuous processes of collaborative transformative practices of people in the amalgamation of society, culture and history at the interface of past, present and future.

In the next section, we will discuss how conceptual commonalities and differences between Vygotsky and Piaget discussed in the present section find their way into and become embodied within concrete educational practices and school curricula.

**Implications of Piaget and Vygotsky for Teaching and Education**

**Socio-interactionist Approaches**

Many present-day approaches in education, seeking solid grounding in psychological theories of development, turn to Piaget and Vygotsky for guidance and insights. Thus, Piaget’s theory has inspired a rich tradition of constructivist education in which learning is primarily defined as a process of concept construction through active interpretation and reorganization of conceptual schemas by the learner. This approach places emphasis on developing thinking through children’s active construction of action schemas as they act on objects and abstract invariant aspects and the logic underlying their actions. Learning is viewed as a self-regulatory process through which cognitive conflicts between existing individual models of the world and new insights gained in actions must be solved. Teaching is redefined (vis-à-vis traditional static approaches) as the provision of meaningful problems designed to encourage and facilitate the constructive process. By engaging in meaningful problem-solving situations, including discussions with others (peers and adults—equally important partners in Piagetian theory), children are expected to develop conceptual connections that will engender new understandings (e.g. Ginsburg, 1977; Kamii, 1985; Parker, 1993; Schifter & Fosnot, 1993).

This emphasis on engaging students in meaningful pursuits of understandings, on the need to find answers through one’s own actions rather than accept rigid facts, and on the role of discussions with others *de facto* brings Piagetian approaches in education rather close to those Western scholars who are working in the Vygotskian tradition (for how the two often dovetail
into each other, see DeVries, 2000). One further commonality is that they do not focus on providing the learners with cultural tools—on what the child is taught (cf. Arievitch & Stetsenko, 2000; Stetsenko & Arievitch, 2002). The eloquent expression for such a neglect of cultural tools came in the slogan suggested by one constructivist educator: ‘Forget about teaching and focus instead on learning’ (Romig, 1999).

Vygotskian scholars do concern themselves with teaching, as is evident, for example, in the concept of scaffolding (Wood, Bruner, & Ross, 1976). However, even this concept is only loosely related to that of cognitive tools and implies that the quantity or contingency (e.g. moving to less intervention after success and to more intervention after failure) rather than the quality (i.e. content) of teaching and adults’ assistance in general plays a major role in development (cf. Arievitch & Stetsenko, 2000; Tharp & Gallimore, 1988). Another approach (Tharp & Gallimore, 1988) has addressed the strategies of adults’ assistance focusing on modeling, contingency managing, feedback, questioning and cognitive structuring. However, this analysis concerns the character of adult–child interaction and not the character of tools (e.g. concepts, models, criteria) within such an interaction. The relevance of what concepts are taught is again not considered.

It is only more recently, in approaches that have undertaken the goal of synthesizing a Piagetian approach with aspects of Vygotsky’s theory, that the issue of cultural tools as instruments of mind that need to be provided to students has become more prominent. We briefly present two such approaches.

Terezinha Nunes and colleagues (Nunes, 1999; Nunes & Bryant, 1996; Nunes, Schliemann, & Carraher, 1993) have proposed a perspective on mathematics learning according to which mathematics is a cultural practice into which children need to be socialized. This process involves the redesription of meanings with which children come to school to fit with the systems of signs learned in mathematics classrooms. Unlike Piaget, Nunes points out that even these pre-school forms of knowledge result from children being socialized into a collective systems of signs and thus goes beyond traditional Piagetian accounts of learning. Her goal is to transcend individual mind as the analytical unit of learning, which brings Vygotskian ideas to the fore of her analysis. Furthermore, Nunes focuses on cultural tools and discloses important discrepancies and limitations underlying common tools in many classroom practices. However, she does not indicate which principles must guide curriculum development and intimates that more research is needed on how the specific connections initially established by the teacher reshape the learner’s old meanings.

Another approach to education focusing on cultural tools is the theory of Realistic Mathematics Education. This approach, championed by Paul Cobb (e.g. 1998, 1999), coordinates a social perspective on communal practices with a psychological perspective on individual students’ diverse ways of
reasoning as they participate in those practices. Drawing on diverse theoretical frameworks (Piaget, distributed cognition, sociocultural theory, symbolic interactionism), this approach focuses on classroom mathematical practices as they emerge and are continuously regenerated by the teacher and students, who interpret and respond to each other’s actions. The analytical unit is a classroom practice that reflexively relates to students’ participating in and contributing to its constitution.

Concern with cultural tools as instruments of both communal practices (i.e. mathematics) and individual mind is quite prominent in this approach. As Cobb (1999) explains, a learning trajectory consists of an envisioned sequence of mathematical practices together with the means of supporting and organizing each practice. To this effect, instructional activities are devised so that they constitute a basis for students to reorganize their mathematical thinking and construct increasingly sophisticated mathematical understanding—experientially real mathematical objects (Cobb, 1998).

Cobb’s approach represents a successful and deeply grounded merging and development of many recent progressive lines of thinking about teaching, learning and development. However, his approach is marked by a tension between history and present, between cultural heritage and learners’ construction of meanings in present communities, as described in previous sections. That is, on the one hand, Cobb views mathematics as an important practice that has evolved long before present-day classroom communities and that clearly plays a role in any local classroom practices. On the other hand, he speaks against integrating concepts of normative ways of acting that have emerged during human history, finding such concepts inadequate for research on classroom communities as local emergent phenomena constituted by teachers and students in their ongoing interactions.

This tension is clearly reflected in how instruction is designed and implemented, especially in that researchers focus on observing how students participate in practices and make use of cultural tools, with the teacher subtly guiding the emergence of a classroom culture (Cobb & McClain, 2002), through orchestrating conversations as the primary means to support the learning. While acknowledging the importance of designing the tools, the emphasis is on supporting students’ own activities and their development along emerging learning trajectories. Cobb rejects the idea of building instructional procedures and curriculum content as tools to be learned by students (a top-down approach, in his view) on the grounds that there is no way to ascertain that these tools will indeed be learned by students. Instead, he develops instructional sequences based on tentative and provisional conjectures about possible trajectories for mathematical learning and the means that may be used to support and organize learning.9

Approaches such as those by Nunes and Cobb represent an important step forward in reconceptualizing elementary mathematics education. However, they do not mark a radical enough break (especially in their theoretical
reflection, which somewhat lags behind their own progressive educational practice) with the essentially Piagetian concept of the social as social interaction to instead embrace a Vygotskian dialectics of history. It is in the solution to the problem of how the cultural practices of specific disciplines and knowledge representing these practices can be introduced to learners for more complex forms of understanding to emerge that has been offered by followers of Vygotsky who expanded his ideas. Before we address this solution, we present results of an observational study that focuses on one example of the socio-interactionist constructivist curriculum.

Observing Fourth to Fifth Graders Engaging in Math Problem-Solving

A fifth-grade classroom in a public school in New York City (twenty-eight students, one teacher and one substitute teacher) was observed by the first author during math lessons between spring 1999 and spring 2000. Field notes from participant observations of lessons and records of students’ activities (student sheets and notebooks) were collected. Analysis focused on the ways students engaged in problem-solving activities with the aid of various cultural tools (concepts, mathematical symbols, strategies, graphs, schemes, etc.). This analysis revealed children’s understanding of mathematics and enabled us to interpret their advancement in mathematical thinking by looking at transformations in ways of symbolizing that involved particular types of generalization and abstraction. Thus, the analysis focused on what children actually do when they learn the curriculum, and its impact on their learning and development.

The curriculum. The teacher followed a constructivist curriculum titled Investigations in Number, Data, Space (Mokros, Russell, & Economopoulos, 1995), in which mathematics is defined as a way of approaching a problem by using one’s own logic and power of observation. The curriculum emphasized that students: (a) think for themselves about the mathematics they do, rather than simply apply learned material; (b) do not expect to find one single approved way of solving problems; (c) use multiple ways of solving problems and double-check their solutions; (d) share their strategies, compare approaches with each other and engage in discussions about differences in strategies and results; and (e) learn how to interpret answers and explain why they do or do not make sense. The first unit taught in fifth grade focused on exploring multiples and factors. Problem-solving activities were provided involving building numbers in different ways (e.g., skip counting, multiplying factor pairs, etc.). The second unit centered on developing ‘number sense’ through computation and estimation skills, for which students were expected to develop a wide range of strategies (e.g. reasoning about multiples to tackle multiplication and division, breaking
problems into smaller parts, etc.) based on what they already know about number relationships and the meaning of the operations. In addition to prescribing what children must be taught in elementary mathematics, curriculum developers aimed at providing a coherent set of investigations that allow all students to explore mathematical ideas, and, through this, address the issue of how to teach children. The ‘investigations’ in which children engaged included multiple problems for which a previously introduced strategy would prove useful. Students, then, were expected to appropriate the use of several such strategies and flexibly employ them according to the demands of a given task. To this effect, students were encouraged to engage with problem-solving activities in the out-of-school context of everyday cultural practices in which arithmetic operations were embedded (e.g. activities involving the use of currency).

Social interaction in the classroom. The observed curriculum was structured so as to allow for specific types of teacher–student and student–student interactions (Schifter & Fosnot, 1993; Zolkower, 1996). The lessons were enacted through three consecutive segments—whole-class discussion (introduction), small-group activities and whole-class discussion (conclusion)—to allow for children to discuss and resolve conflicting points of view and thus create opportunities for learning. The teacher was very skilled in managing interactions and demonstrated high command over the classroom ‘turn allocation machinery’ (Mehan, 1979), including managing social norms: students were expected to and did explain and justify solutions, made sense of explanations given by others, indicated agreements or disagreements, and proposed alternatives when a conflict in interpretations was apparent.

Findings. Overall, children actively engaged in classroom activities and no passive transmission of facts or knowledge was practiced in the classroom. They actively and continuously constructed their knowledge as they negotiated solutions, resolved conflicting views, argued about what constituted an efficient solution, and so on. They were active participants in the classroom community of practice, especially at the level of discourse, and collectively created with the teacher a very supportive environment for learning. The teacher’s level of commitment and mastery was hard to overestimate. These important accomplishments notwithstanding, many children did not make much progress during the three semesters of observations. Ultimately a significant number of children (about a third) failed to construct a general method to orient themselves in solving arithmetic problems and, consequently, their performance remained inconsistent. This was evidenced by countless occurrences of inadequate choice of tools for the task at hand. Children often automatically followed procedures and failed to complete tasks due to inability to integrate their partial solutions. In those instances, it was clear that the meaning of arithmetic operations and of the links among
them was not clear to students. In addition, many children had difficulty employing the learned tools across different contexts. Not surprisingly, many children could successfully use strategies only to tackle calculations involving small numbers.

Importantly, children were not able to set themselves free from apparent but misleading aspects of the tools they were taught. For example, many children failed to solve two- and three-digit multiplication problems through reasoning about multiples and by breaking problems into smaller parts. This is not surprising given that such strategies do not disclose central features of multiplication and, thus, have a limited potential to help children to orient themselves in tasks that involve this operation. It was particularly revealing that a child who had failed to solve a multiplication problem by breaking up a three-digit number into smaller ones succeeded only when the teacher represented the problem with the use of an array model. Arguably, this way of representing multiplication embodies the meaning of this operation by preserving the one-to-many correspondence notion essential to it (cf. Nunes, 1999).

Children’s limited advance in approaching the tasks based on essential features of mathematical concepts impinged on their overall progress by hindering their ability to analyze, plan and reflect upon their actions, to set goals and systematically control how they are attained. Ultimately, the limitations inherent in the tools seriously compromised some children’s learning motivation, as evidenced by the following longitudinal analysis of one student’s progress over the course of the study. Jason (a pseudonym) is a 12-year-old boy who actively participated in all lessons and completed all the assignments. He learned how to use some tools in familiar situations and could easily solve problems that contained familiar numbers and he consistently succeeded in tasks involving multiplication whenever he solved them through modeling them as arrays. However, on many occasions he failed to choose an appropriate tool to orient himself in the task and had difficulties solving problems that involved larger numbers. The teacher agonized over his unstable and inconsistent performance throughout the entire year. Particularly toward the end of the year, Jason became increasingly frustrated with his performance, which left him in a vulnerable position among his peers. On some occasions, after failing to solve a problem, Jason burst into tears in the classroom. The teacher was extremely sensitive towards Jason (and to any child experiencing difficulty) and would patiently provide several extra explanations to him. Nonetheless, she confessed to the first author that she did not know how else to help the boy.

Summary. The findings show that the curriculum succeeded in engaging students to actively participate in classroom activities and discourses. However, it did not succeed in providing experiences with the tool use that disclosed the regularities of how mathematical concepts (e.g. numbers and
the four arithmetic operations) evolve, develop and relate to one another in
the contexts of human practice. Consequently, knowledge from pre-existing
practices (i.e. tools) was part of the process (inevitably so), but since
designing tools was not perceived as an important educational strategy, and
not conceptualized as the constructive transformative process of past expe-
riences, this knowledge was presented in forms often based on misleading
aspects of problems. As a result, a large number of children were not
successful in orienting themselves in the tasks and could not distinguish
between essential and inessential relationships among objects when solving
mathematical problems, even though they had been exposed to them for a
long time. Thus, the tools provided to children often did not support
transformations of children’s activities into more complex forms of
thinking. It was particularly disturbing to witness many children wasting
their creative potential and energy and even giving up on math altogether,
which evidently had repercussions for their overall development, as
illustrated by Jason’s case.

Teaching, Learning and Development: Cultural-Historical Activity
Theory

As is well known, Vygotsky claimed that social interactions mediated by
cultural tools are the foundation for and the source of human development.
His most directly educationally relevant views focused on teaching-and-
learning and development as being intricately related processes, with the
former conceptualized as paving the way for development. To Vygotsky,
learning and development are not the same processes; however, properly
organized instruction engenders developmental processes that would not be
possible apart from teaching-and-learning (Vygotsky, 1978). This was
explicitly articulated in Vygotsky’s concept of the zone of proximal
development, according to which children develop as they engage in
collaborative activities.

As discussed above, most sociocultural theorists working in areas of
education construct their implications for learning and instruction around
these two ideas, relatively disregarding the role of specific cultural tools in
these processes. Ironically, it is the more constructivist-oriented scholars
such as Nunes and Cobb, working out their instructional methodologies by
synthesizing Vygotskian principles with those of Piaget, who have come to
appreciate the importance of immersing learners in culturally evolved
practices (e.g. of mathematics) through the use of cultural tools. However,
the issue of how such tools can be designed so that they indeed allow the
students to become immersed in cultural practices of disciplines is not
resolved in these approaches (and even negated as impossible, see Cobb,
2002), and so their focus inadvertently shifts from a design of tools to
loose strategies of supporting and ‘gently guiding’ students’ meaning-making activities.

It is here that this approach can be expanded by the activity theory notions of learning and development and by ideas about designing instruction developed by Vygotsky’s followers, primarily Galperin (e.g. 1985) and Davydov (e.g. 1986/1988, 1990). Their works can be classified as cultural-historical activity theory (CHAT) and thus provide an important illustration of this theory (for details of how Galperin and Davydov relate to Vygotsky, see Arievitch, 2003).

Galperin on designing instruction. Extending Vygotsky’s claims about the relation between teaching-and-learning and development, Galperin focused on cultural tools provided to children and their impact on development. Cultural tools were conceptualized not as static objects, but as embodiments of certain cultural practices, crystallized templates of actions, schematized representations of certain ways of doing things as discovered in the collaborative history of humanity. According to Galperin, the relationship between learning and development is not uniform, and development stands in a different relation to particular types of instruction with a different developmental potential (Arievitch & Stetsenko, 2000; Stetsenko & Arievitch, 2002;11 for a relevant discussion see also Karpov & Haywood, 1998). In other words, not all kinds of instruction are equally conducive to development, and the latter is highly contingent on the particular type of instruction and associated learning.

Based on extensive theoretical and empirical studies, Galperin concluded that the type of instruction that is most conducive to development is characterized by the provision of means for theoretical generalization that allow students to orient themselves in a systemic way in a given subject domain. The main feature of his analysis is that it aims to reveal the ‘genesis’ and the general structure of objects or phenomena (the basic makeup of things) and to develop cultural tools that reflect these features in a form most conducive to application in classroom practices. In such applications, then, students learn to distinguish essential characteristics of different objects and phenomena, to form theoretical concepts on this basis, and to use them as cognitive tools in further problem-solving. Thus, this approach revolves around designing cultural tools that specifically provide experiences in which the evolving histories and functions of these tools are made explicit and accessible so that the students can engage in and re-enact meaningful activities embedded in these tools.

Galperin’s approach was implemented in organized teaching–learning process that can be called systemic-theoretical instruction. In brief, this instruction employs cultural tools as learning materials (i.e. concepts, theories, ideas) that present in a generalized form the essential features of a given class of phenomena. These features pertain to general regularities in
how phenomena evolve and relate to each other in human practices. Accordingly, efficient cultural tools are typically found in historically evolved knowledge that captures the lengthy evolution of previous generations’ practices in dealing with particular classes of phenomena. In contrast to traditional instruction, children learn the logic and history of how cultural practices such as mathematics evolved, including the origin and purposes of these sociocultural practices and of concepts employed in them.

The principles of systemic-theoretical instruction were implemented by Galperin and his colleagues in a variety of subjects, including science, language and history. Perhaps the most illustrative is the program of elementary mathematics. In this program, children were systematically introduced to the idea of measurement, because all basic mathematical concepts emerged in the evolution of the cultural practice of measurement. First, children were introduced to how important measurement is in various everyday situations; then they learned to use measurement as an analytical tool with which to derive fundamental concepts in elementary mathematics. It was only after such practical-analytical work that the concept of number was introduced—not through separate objects but generically and historically, that is, by reconstructing the genuine problem and practice that had served as the source from which this concept emerged.

**Empirical versus theoretical generalization.** The work focusing on teaching—learning and development, including cultural tools, was continued in Davydov’s (1990) ‘developmental teaching theory’ pertaining to types of generalization in instruction. According to this theory, schools typically do not teach children to flexibly operate with knowledge, to see internal connections between things and to distinguish between their superficial attributes versus their essential properties. Davydov claimed that this can be attributed to a failure to recognize that there are two basic groups of phenomena to which the term generalization applies, namely empirical and theoretical generalization.

**Empirical generalization** refers to the process of describing properties of a particular object and then finding and singling them out in a whole class of similar objects. This process can be characterized as follows. On the one hand, there is a search for a certain invariant in an assortment of objects and their properties, and the designation of that invariant by a word. On the other hand, there is the use of invariants singled out to identify objects in a given assortment: for example, forming the idea of an angle as a generalization of all the observations of angles in different objects, which can be represented by a specific symbol. To form an empirical generalization, schools typically choose large numbers of facts to provide a groundwork for creating an abstract idea about the quality that unites all the facts. This requires putting together collections of objects in order to make comparisons of these objects and to detect their common, stable, repeated qualities. In this sense,
generalization is inseparably linked to the operation of abstracting: delineating a certain quality as a common one includes separating it from other qualities. The general quality is then converted into an independent (concrete) object as belonging to a certain class. This allows the child to apply appropriate rules of operation. The ability to use a certain rule presupposes the delineation of some quality in an object to which that rule corresponds. However, it is usually not possible to delineate a group of objects on the basis of only one similar property. A combination of two, three or more abstract and general attributes that are represented in a certain word is usually called a concept. Consequently, the group of generalized attributes of an object is the content of the concept.

The alternative type of generalization is the theoretical generalization, which, according to Davydov, corresponds to theoretical thought, distinct from empirical thinking. Scientific thinking requires constructing special theoretical abstractions—the isolation of connections among things and the conversion of that connection into a particular object of study. This type of thinking is not a simple extension, intensification and expansion of people’s everyday experience. Rather, it requires a particular analysis and type of generalization to detect an interconnection between the general and the individual (particular) processes and phenomena. In contrast to empirical thought, theoretical thought is not based on comparisons of externally observable and directly perceptible phenomena and it is not directly given to perception. Thus, theoretical thought reveals internal connections in a given area that exist only in their relationship. Theoretical concepts are not based on identifying identical aspects of a particular object in a class of objects. Therefore, these concepts bring together things that in their appearance can be dissimilar, different, multifaceted and not coincidental. Importantly, theoretical concepts trace the interconnection of objects within the system of their formation, that is, of how they came into being in previous practices.

A theoretical concept, then, functions as a form of activity whereby an idealized object and the system of its connections are created and reproduced. A revealing example is Spinoza’s definition of a circle: ‘A figure described by the rotation of a line with one end free [moving] and the other fixed’ (quoted in Davydov, 1990, p. 251). This is the description of the construction and method of operation of the pair of compasses that allows for a genetic-theoretical (i.e. historically and developmentally grounded) understanding of certain regularities of circles, such as the constancy of the radius, without having to memorize a ready-made fact that does not mean anything beyond itself. To make this type of a generalization means to discover a principle, a necessary connection of individual phenomena within a certain whole (Davydov, 1990) and within a developmental trajectory of practices from the past to the present.

Instruction devised on the grounds of Davydov’s principles has been practiced since the 1960s in schools across Russia and other republics of the
former Soviet Union. It has been successful in helping generation after generation of students to develop the type of thinking that penetrates the otherwise hidden logic of phenomena and processes through a genetic, developmental teaching-and-learning. Importantly, Davydov’s works can be seen as an important elaboration on Vygotsky’s theme of everyday versus scientific concepts, the ZPD, and on teaching–learning as leading development. Presenting the full scope of their achievements, as well as of inevitable gaps and controversies, goes beyond the scope of this paper, but interested readers can find overviews and continuation of this approach on an international scale (e.g. Bartolini Bussi, 1998; Hedegaard, 1999a, 1999b; Lompscher & Hedegaard, 1999; Schmittau, 1993; Zuckerman, 2003).

Linking the Past and the Present: Bridging the Gaps between Socio-interactional Constructivism and Activity Theory

The activity theory approach in education, although acknowledging that learning is immersed in the cultural practices of present communities, focuses more on learning and development as a continuation of past cultural practices developed in the history of humanity than on present-day and future practices of communities. In this sense, it capitalizes relatively more on the historical part of Vygotsky’s cultural-historical approach than on the part related to the forward-looking transformative practices that are needed to enact history in the present. Thus, this approach adds an important piece to the puzzle of constructivism, revealing ways in which learners can be immersed within continuous flows of cultural-historical communal practices of humanity, and the great benefits of such immersion, but somewhat at the expense of the creativity and agency of today’s communities and individual learners.

As discussed in previous sections, many recent approaches to learning and development, focusing on learning as participation in communities of practice, have made spectacular progress in understanding how learning is a part of children’s immersion in these present-day practices. However, they do not allow for the students to benefit optimally from past experiences of people in which many discoveries have been made in the lengthy processes of human history.

Thus, both approaches relatively disregard, each in their own way, the important link between the past and the present, which comes to the fore if we address the dialectical view of history.

It is this view that needs to be discussed, elaborated upon and integrated into accounts of development and learning. It posits that history is not something completed and fixed, but rather is one dimension in a constant multidirectional flow of social transformative practices of humanity in which past and present always co-exist and even co-evolve in an ongoing fluid and dynamic process. Within this view, it is strikingly clear that present
generations never invent their world and themselves from scratch but inevitably continue their past, even if by completely breaking away from it. However, it is also clear that the past does not simply evolve in the present but is enacted by each generation of people each time anew and in view of the present and the future (which is flexible too), through innovative and bold contributions to it. This mutual interpenetration of past and present can be well captured by the metaphor that the present without the past is blind, but the past without the present is powerless.

The combination of the two approaches that each focuses on the past or the present, therefore, can provide a foundation for a synthetic and dialectical approach to learning and development in which the co-emerging development of the individual human being through and in humanity as well as the development of humanity through and in each individual human being is placed at the center as a never-ending, ongoing, continuous process of expansion of collaborative transformative practices of people in the amalgamation of past, present and future. In this case, an approach that acknowledges history in its dialectical meaning does not have to entail the authoritarian and unidirectional doctrine of education. On the contrary, such an approach is even more radically liberal than the now prominent liberal trends in education because what is placed at the center is not the child alone and not even the classroom practice existing here and now, but rather the dialectical co-authoring of development and history by each and every individual child (and teacher) with the rest of humanity (including its past and present generations), through collaborative activities that continue and simultaneously transform history. In this case, the students and teachers, instead of being de-individualized by seeing them as part of humanity, are in fact empowered to a larger degree than in any other, more individualistically based visions of education because taking the dialectical view of history means the ineluctable agency and responsibility of people, including each and every individual, as actors who together create society and history itself and are created by them.

Conclusions

We have been motivated in this paper to show that constructivism, as a deeply transactional, action-rooted approach with emphasis on people as agents of their own development, is in need of further developing its foundational premises in order to build a unified alternative to the growing tide of cognitivist, essentialist, positivist and maturation-based approaches in the social sciences, especially psychology and education. The type of analysis we have chosen in pursuing one aspect of such a unified framework has focused on how socio-interactional constructivism can be juxtaposed and
ultimately merged with the activity theory of education developed by Vygotsky’s followers.

Taking this path entailed analysis of both the underlying similarities and differences between (and partially within) these two perspectives. It also entailed a close examination of their educational implications, including those that result from (and co-determine) their differing views on what develops in learning and development and how instruction can be tailored to this central notion. We delineated and described a pivotal difference in views on the role of culture and history in development that continues to separate Piaget and Vygotsky and educational approaches associated with their theories.

As we discussed, this pivotal difference concerns whether emphasis is placed on the importance either of immersing learners in activities, through participation, in present-day community practices, or of immersing learners in the ongoing, continuous flow of collaborative practices of humanity (not just of the here and now) that extend from the past and exist prior to each individual learner and each individual community. In delineating and illustrating this difference, we examined the notions of cultural tools and types of generalization in sociocultural versus activity-theoretical approaches, as well as associated instructional procedures and curricula examples. We posited that activity theory adds an important piece to the puzzle of constructivism, showing how learners can be immersed in the cultural-historical communal practices developed in the history of civilization, and the benefits of such immersion. Finally, we indicated that a synthesis of these two educational practices needs to be undertaken within a dialectical view of history to avoid the one-sided emphasis on either the past or the present practices that still divides constructivist approaches.

We did not address the broader contexts in which schools are embedded and which profoundly saturate schooling with political and ideological dimensions. Together with many other authors (including many postmodernist theorists), we acknowledge that an account of these effects on and in schooling is much needed. This invites a dialogue with a broad scholarship focusing on issues of diversity and power in education, allowing for a further expansion of the unified anti-essentialist constructivist foundation for psychology and education. It is this kind of an ideology-driven, inclusive (of various constructivist streams) foundation that can be used to change education so that the learners can engage in and contribute to unlimited expansive cycles of exploration, discovery and transformation of the world we all live in.

On a final note, we believe that the analysis presented in this paper, although it started with abstract assumptions and contrasts among various frameworks, shows that such assumptions (of a theoretical generalization type) can in fact become practical tools with which to discuss, explore and perhaps even reveal new directions in education. In this sense, this analysis
serves as an example that theory is indeed always very practical, counteracting the view that it belongs to the fuzzy and unproductive world, as is so often implied today.12

Notes

1. In this paper, we will not focus on the concept of the future, though it represents a crucial piece in understanding the dialectics of history.

2. In view of the relative recency of these versions of constructivism (and the often scanty familiarity of English-speaking scholars with activity theory), combined with accelerated developments in their interpretations in the past few years, it is not easy to name them adequately. Many authors, including us, struggle with this problem, turning to terms such as cultural-historical activity theory (CHAT), sociocultural, neo-Vygotskian, post-Vygotskian theory. As the theoretical understanding expands and more consensus emerges, a better choice of terminology will likely become possible.

3. On congruency between Vygotsky’s life and ideas, that is, on how the life history of his project de facto embodies the very theoretical principles central to it—about the collaborative nature of mind and knowledge, the inseparability of theory and practice, knowledge and action—see Stetsenko and Ariveitch (2004) and Stetsenko (2004).

4. Works by Holzman (1999) and by Newman and Holzman (1993) have brought the concept of transformative social practices to the fore in interpreting Vygotsky. Similar ideas can be found in Dunn and Lantolf (1998) and Engeström (1999). Many Russian scholars had also made similar points in earlier works (e.g. Asmolov, 2001; Leontiev, 1978). As will become clear from the discussion below, the ways to proceed from such an important point can still differ in many respects.

5. These aspects of Vygotsky’s theory have become truisms in Vygotskian scholarship. They are repeated here to gradually build up contrasts that will lead to the main message of this paper.

6. In its extreme forms, this view is sometimes contrasted even with Vygotsky’s own putative emphasis on ‘solo activity’ (Matusov, 1996; cited in DeVries, 2000, p. 192).

7. Teaching-learning is precisely the meaning of Vygotsky’s term obuchenie (in Russian), previously often erroneously translated as learning.

8. These authors did not focus enough on the processes through which practices existing prior to individual learners and present communities, in order to become alive, are being carried out, performed and transformed by learners and communities.

9. Perhaps in realization of this tension, and despite the theoretically synthetic basis of his approach, Cobb explicitly rejects the goal of achieving theoretical synthesis, such as reconciling Piagetian and Vygotskian theories.

10. These observations were part of the evaluation research led by Joseph Glick for a large project entitled ‘Math in the City’, which was sponsored by the National Science Foundation and developed by Catherine Fosnot. Fosnot’s aim was to transform elementary mathematics teaching along constructivist principles in sixteen public schools in New York City.
11. Discussion in this section is generally derived from works by Arievitch that have been instrumental in understanding, re-conceptualizing, and expanding Galperin’s ideas, scattered across his published and unpublished works and often presented in a somewhat cryptic form (see Arievitch, 2003; Arievitch & Haenen, 2005; Arievitch & Stetsenko, 2000; Arievitch & van der Veer, 1995; Arievitch & van der Veer, 2004).

12. This comment is particularly aimed at the recent publication (Mayer, 2004) in a prestigious journal, American Psychologist. This paper essentially invited readers to abandon theorizing about constructivism (dismissed as unnecessary ‘nitpicking arguments about which expert said what about which version of constructivism’, p. 18), and to focus instead on evidence-based arguments, as if the two can exist without each other.

References


Eduardo Vianna received an MD from the Federal Fluminense University in Rio de Janeiro, Brazil. Then he completed a residency in child psychiatry in the same university. Currently he is a Ph.D. candidate in developmental psychology at CUNY-Graduate Center. His research focuses on cultural-historical activity theory as a conceptual tool for promoting social development and social justice in institutional contexts, including community-based programs and schools. Address: Ph.D. Program in Developmental Psychology, Graduate Center, The City University of New York, 365 5th Avenue, New York, NY 10016, USA. [email: evianna@gc.cuny.edu]

Anna Stetsenko is Associate Professor and Head of the Ph.D. Program in Developmental Psychology, and faculty member in the Urban Education Program, both at the Graduate Center of The City University of New York. She earned her Ph.D. from Moscow State University, and has worked in, taught and published on Vygotskian cultural-historical activity theory since the early 1980s. She focuses on learning and development, development of mind, the self and history of psychology, re-conceptualizing these topics from the standpoint of activity theory. Address: Ph.D. Program in Developmental Psychology, Graduate Center, The City University of New York, 365 5th Avenue, New York, NY 10016, USA. [email: astetsenko@gc.cuny.edu]