

## ARTICLES

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# Social Constructivism and the Process–Content Distinction as Viewed by Vygotsky and the Pragmatists

Richard S. Prawat

*College of Education*

*Michigan State University*

In a recent article in this journal, Stetsenko and Arievitch compared and contrasted 3 versions of social constructivism, all of which successfully deal with one vexing epistemological problem, the separation of mind and world. However, solutions offered by the first 2 approaches are problematic, according to the authors, because of the way they treat the subject–object issue. On this score, Gal’perin’s (1989) brand of post-Vygotskianism is preferred because it manages to retain the individual while externalizing the mind. As I point out in this article, all 3 approaches fail when it comes to solving a third, equally intractable problem—the process versus content dualism. In the last part of the article, I present a promising solution to all 3 problems first proposed by Peirce and Dewey and later embraced by Lev Vygotsky in the last years of his life.

Stetsenko and Arievitch (1997), in a recent article entitled “Constructing and Deconstructing the Self: Comparing Post-Vygotskian and Discourse-Based Versions of Social Constructivism,” performed a service for scholars by showing how two prominent variants on Vygotskian theory relate to mainstream social constructivist theory. In both versions of Vygotskian, or, more appropriately, post-Vygotskian theory, *activity* is viewed as the key unit of analysis. These views, they argued, serve as a counterpoint to *discourse-based* social constructivism, promoted by prominent theorists like Gergen, Shotter, Harre, and others.

Despite unit of analysis differences, all three perspectives are thought to share a common set of assumptions: first, the notion that learning and development is a process of co-construction leading to an increase in self-regulation and intentionality on the part of the individual; second, the notion that this process takes place within and is actively shaped by culture and historical context; and, third, the idea that language, defined broadly to include verbal and nonverbal forms of communication, is a key mediator in this process. As a result, all three perspectives are equipped to deal with a problem that plagues modernist psychology, the dualist distinction between mind and world.

Stetsenko and Arievitch (1997) are more guarded with respect to a second vexing dualism, that between subject and object. According to their analysis, only one of the three versions of social

constructivism, that proposed by Gal'perin (1989), is up to this challenge. I agree with their analysis, but argue in this article that all three approaches fall prey to a third insidious dualism—the tendency to separate process from content, or thought from what is being thought about. Fortunately, there is yet another version of social constructivism, first proposed by the American pragmatists Peirce and Dewey and later independently arrived at by Lev Vygotsky, that adequately deals with all three of the dualisms mentioned previously. For this reason, I propose that Dewey–Vygotskian social constructivism enjoys a decided advantage over the approaches considered by Stetsenko and Arievidch. Before reviewing the latter's argument, I will address the issue of dualism and why postmodernists seek to avoid its embrace.

### THE PROBLEM WITH DUALISM

Gergen (1994) explained why “binary” approaches, those that distinguish between mind and world, vex psychology: “When a real world is to be reflected by a mental world and the only means of determining the match is via the mental world, then the real world will always remain opaque and the relationship between the two inexplicable” (p. 129). Modernist psychologists, of course, have attempted to deal with this problem, taking their cue from their modernist colleagues in philosophy. The latter, the rationalists and realists, make no bones about the need to come down on one side or the other of the mind–world divide.

Rationalists emphasize structures in the head whereas realists take the opposite tack, looking outward in their efforts to verify knowledge. The former, mostly neo-Piagetians, assume that individuals are in the best position to assess the validity of their own knowledge. Descartes lent credence to this notion when he insisted that the easiest thing for the mind to know is itself (Rorty, 1979). This combined with a second assumption—that true beliefs hang together in a more coherent or integrated pattern than false beliefs—provides the basis for the rationalist test of truth. “Fit” with prior knowledge, or what Glasersfeld (1995) called “conceptual compatibility” (p. 68), is the metric used by rationalist philosophers and psychologists to judge the validity of one's beliefs. Unfortunately, this approach has not fared well in either discipline, primarily because it gives rise to the unwholesome quest for certainty (Rorty, 1979).

The same argument can be made about realists' attempts to compare internal and external structure. As the quote from Gergen (1994) suggests, psychologists who take this tack face an equally daunting problem. Information processing theory is the most prominent example of realist thinking in psychology. Information processing theory places its faith in modern technology—specifically, in the computer and its ability to simulate externally defined processes characteristic of thinking, like classifying input and manipulating symbols. The key is to effect a match between outer and inner computational routines. If a computer program, designed to mimic externally defined processes, produces behavior consistent with that which is observed in humans, the result is said to constitute a “sufficiency proof” (Schoenfeld, 1987, p. 10).

Rorty (1979) argued that dualist approaches to mind–world give rise to the damaging and ultimately futile search for eternal truth. This effort is damaging because, at root, it represents an attempt to “escape from humanity” (p. 377). The more humane and realistic way to view knowledge claims, Rorty argued, is to admit that they represent “optional descriptions” (p. 379)—ways of talking about the world that prove useful but that are subject to revision as new and more efficacious language evolves in a community. Historically, Rorty (1979) added, those in positions of authority have used claims of eternal truth to silence, if not subjugate, those they seek to control.

Dewey (1925/1981), in typical fashion, rejected dualist solutions to mind–world on narrower grounds: It involves splitting things into hard and fast categories and thus is counterproductive from an intellectual standpoint. According to Dewey, “The objection to dualism, is not just that it is dualism, but that it forces upon us antitheoretical, non-convertible principles of formulation and interpretation” (p. 102). The fact that philosophers who endorse such a position have not moved beyond stating and restating their opposing positions for 200 years supports Dewey’s (and Rorty’s, 1979) contention that dualistic thinking is incapable of resolving the very issue (i.e., What is truth?) that called it into being in the first place. Dewey thought that it was time to move beyond dualist thinking.

Unlike Rorty (1979) and the other postmodernists, however, Dewey (1952/1989) did not seek a way around dualist thinking. His intent, rather, was to recast the terms of this debate, substituting a new way of thinking that would highlight the continuity between mind and world rather than the sharp division and isolation characteristic of modernist thinking. He sought, in short, to exchange what he called the “futile problem” of the dualism of mind and world for “specific problems as to how transactions of organism and environment as they take place retard and assist human endeavors” (p. 417).

This last statement by Dewey (1952/1989b) provides a nice segue for a return to the matter at hand. Stetsenko and Arieivitch (1997), I submit, had an ambitious goal in mind, one that was not unlike Dewey’s. The social constructivism they advocated sought not only to exchange the futile problem of mind–world for an approach that is transactional or mutually reciprocal, it also addressed the equally vexing question of the role of subject in such an ontology. Postmodernists like Rosenau (1992) have argued that subject–object represents a particularly insidious distinction because it assigns an active, “one-up” role to the observer, as subject, while relegating those being studied to a “thing-like” object status.

According to Stetsenko and Arieivitch (1997), the subject–object distinction is a second major issue that divides discourse based and post-Vygotskian versions of social constructivism. The former approach dispenses with subjects altogether. Theorists of his ilk, Gergen (1994, p. 242) explained, link subjectivity to mentalism. By getting rid of one, they get rid of the other. The first of the post-Vygotskian approaches (Rogoff’s) offers a partial solution to the subjectivity problem, Stetsenko and Arieivitch maintained. The second, Gal’perin’s (1989) approach, is the only one that solves the subject–object dilemma in a theoretically satisfying way, retaining the individual while externalizing the mind.

As indicated previously, I argue that Stetsenko and Arieivitch (1997) did not go far enough in their analysis of the three versions of social constructivism. They overlooked a *third* dualistic dilemma, one that Dewey (1891/1969) singled out as being particularly vexing in psychology and education—that between process and content. Dewey identified this issue as being about “apart thought,” the mistaken notion that one can distinguish “the object thought about” (i.e., content) from “the way in which the mind thinks of it” (i.e., strategies or routines used to process content; p. 128). Dewey (1891/1969) elaborated on the problem this way:

It is assumed, in fine, that thought has a nature of its own independent of facts or subject-matter; that this thought, *per se*, has certain forms, and that these forms are not forms which the facts themselves take, varying with the facts, but are rigid frames, into which the facts are to be set. (p. 128)

The separation of process and content characterizes all three of the approaches to social constructivism discussed by Stetsenko and Arieivitch (1997). The failure to deal with this prob-

lem, in fact, represents the gravest problem confronting this approach to learning. Vygotsky (1997d) himself understood this near the end of his life. It led to a dramatic shift in his thinking in the last few years of his life, moving his theory much closer to that of his erstwhile counterparts in the United States, Dewey and Peirce.

Vygotsky began to focus on the development of meaning, viewing it as a complex and interactive three-stage process: Thought begins as sense, Vygotsky argued. This was but one of two important “cells” in the “fabric of the mind,” as Vygotsky came to view it (Yaroshevsky, 1996, p. 172): The other was “meaning” (Yaroshevsky, 1996, p. 172). It is in this second cell that thought undergoes its most dramatic changes under the influence of what Vygotsky (1997d) termed the “internal structure of the sign operation” (p. 133). Meaning, once parsed into its “universal” and “singular” elements, is next put into words (p. 136). Meaning-making, Vygotsky came to understand, is in equal measure process *and* content. Before developing this point, I will elaborate on Stetsenko and Arieivitch’s (1997) treatment of the different versions of social constructivism.

### DISCOURSE-BASED AND POST-VYGOTSKIAN SOCIAL CONSTRUCTIVISM

Discourse-based theorists like Rorty (1979) and Gergen (1994) echoed Dewey (1926/1984b) in their belief that problems associated with the search for truth are unlikely to ever be resolved. They differed in the implications they drew from this conclusion, however. Rorty and Gergen argued that scholars ought to abandon the “epistemological project” that gives rise to this search altogether. There is a simple way to do this, they argued: Do away with the whole notion of individual mind. Gergen (1994) insisted, “The presumption of minds as possessions of independent individuals generates a set of intractable problems” (p. 35). According to Gergen, all knowledge can be located in language, thus moving it out of individuals’ heads and into the world.

Post-Vygotskians, like their discourse-based colleagues, see advantages in doing away with individual mind. They stop short of endorsing the radical solution put forward by Rorty (1979) and Gergen (1994), however. According to Stetsenko and Arieivitch (1997), post-Vygotskians view external mind as a *complement*, not an alternative to, individual agency. This group of social constructivists, in other words, believe it is possible to have it both ways: One can do away with the mind–world distinction, which is especially troubling for the discourse-based social constructivists, without having to deconstruct individual “self” in the process.

One of the two variants on post-Vygotskianism (i.e., the Gal’perin, 1989, approach) enjoys a second advantage according to Stetsenko and Arieivitch (1997). It helps resolve the second dualistic dilemma mentioned previously, that of subject–object. This problem, they argued, has not been handled well by one prominent group of post-Vygotskian scholars, best represented by Rogoff (1990) and her colleagues (Cole, 1996; Lave, 1991). This group, Stetsenko and Arieivitch argued, focuses on intersubjectivity (i.e., shared understanding), but in so doing neglects the important process of “subjectivation.” Rogoff, they added, stops short of explaining how “a competent, self-efficacious, independent subject emerges and functions in shared activities” (Stetsenko & Arieivitch, 1997, p. 168).

It should be pointed out, in fairness to Rogoff (1997), that the problem referred to above represents more deliberate strategy on her part than oversight. This is made explicit in her most current work. Individuals who participate in joint action are automatically part of a larger whole, Rogoff argued in a chapter. The important issue is how individuals “position” themselves vis-à-vis this larger whole—whether they play a peripheral or more central role in the collective effort, for ex-

ample. This, in turn, is largely a function of how much skill or competence individuals can muster in carrying out their assigned duties. The focus, Rogoff argued, ought to be on what individuals *do*, not what they *can* do. Individuals do not disappear in Rogoff's approach. Researchers can focus on the individual "plane of analysis" as long they keep in mind the fact that the individual is embedded in a context that is both interpersonal and cultural:

In an analysis focusing on individual processes, the individual's contributions are in focus and those of the other people are blurred, but one could not interpret what the individual was doing without understanding how it fits with what is going on around. (Rogoff, 1997, p. 269)

Rogoff proposed a *methodological* solution to the problem of what to do with the individual in social constructivist theory that is very similar to the one advanced by Cobb (1994). Both approaches are open to the criticism that they fail to address the public-private issue in a substantive way. Gal'perin's (1989) approach, Stetsenko and Arievitch (1997) suggest, represents a more theoretically satisfying way to retain the individual while externalizing the mind.

Gal'perin (1989) managed to lessen, if not totally erase, the Cartesian dualism between mind and world. He accomplished this by a kind of verbal slight of hand: All mental action is external in the sense that it is tied to the actual objects and events that make up problem situations. The purpose of all action, mental or otherwise, is to transform situations. Mental action, unlike material action, can occur away from concrete artifacts or supports. It is a covert form of physical action, carried out, as internal speech, apart from the actual physical field of action. According to Gal'perin, the ability to act mentally develops over time and is indicative of increased competence in the individual. One advantage it offers is that it enables the individual to test possibilities in an abbreviated fashion, prior to actual physical enactment. As Gal'perin explained, "The ability to perform an action mentally makes possible foreseeing the results of that action if and when it becomes external" (p. 45).

The fact that external action lies at the core of mental action is an important attribute to keep in mind. It accounts for the paradoxical nature of mental action as conceived by Gal'perin (1989): This type of response, although covert, is just as tied to the material nature of objects and events as is physical action. This fact is readily evident, according to Arievitch and van der Veer (1995). They used the example of planning, at work perhaps, to rearrange furniture in a room at home. Like the physical analog to this action (i.e., actually moving objects), mental action must take into account the material properties of things—the size of the room, the sizes and shapes of pieces of furniture within the room, and so forth. The fact that mental action must accommodate physical attributes of this sort ensures that it conforms to laws of the external world rather than some imagined "internal psychic laws" (Arievitch & van der Veer, 1995, p. 120).

According to Stetsenko and Arievitch (1997), Gal'perin (1989) assumed that there is an objective, material aspect to all human action, including mental action. In fact, the basic structures underlying external and internal activity are thought to be identical. Mental action, even in its abbreviated form, retains all essential elements of the original, material action: Gal'perin wrote, "No abbreviations of an action alter its level; it remains at the level whose elements are essential to its execution," (p. 54). In this sense, Gal'perin followed the lead established by Leont'ev (1978) and other members of the so-called Kharkov school.

The Kharkov school, under some pressure from the Soviet government, abandoned Vygotsky's increasing idealistic emphasis on sign mediation in favor of a more down-to-earth, activity focus. As

Arievitch and van der Veer (1995) put it, the focus in this group “shifted from the internalization of the mediated structure of social interaction to the transformation of external object-related meaningful activity into internal, mental forms of activity” (p. 114). This transformation process, it was thought, involved much more than the simple movement of a mechanism from the outside to the inside.

Psychologists must resist the temptation, Gal’perin (1989) insisted, to view mental activity as a process that occurs within the head. It is this spatial metaphor, he argued, that makes the externalization of mental activity tantamount to doing away with the subject. It is possible, in his scheme, to have internalization, defined as development of the ability to act apart from objects and events, without conceding the larger point: that mental activity, like all human activity, is external and object-related. Internalization represents a broadening of the opportunity to act, allowing the individual to operate in the absence of objects and events, but it does not represent a change in the fundamental nature of the action. Action, even when carried out in the mind, retains its concrete operational content.

Stetsenko and Arievitch (1997) put great faith in Gal’perin’s (1989) solution. Because Gal’perin defined *internalization* behaviorally (i.e., the ability to act apart from the immediate situation) and not spatially, he is able to finesse the internal *with* subject versus external *without* subject dichotomy that has proved so troublesome to the postmodernists. (Postmodernists like Gergen, 1994, are willing to do away with subject [i.e., agentic self] if it enables them to move beyond the epistemological impasse associated with an internal, mental representation view of knowledge.) Subjects, in Gal’perin’s scheme, act “agentially” (i.e., mentally) but do so in a way that is every bit as concrete and tied to objects as their physical activity.

Gal’perin (1989) did more than pay lip service to the role of the individual in sociocultural activity, which is one way to characterize Rogoff’s (1997) approach. He offered an alternative to the problem that Rogoff handled with her “planes of analysis” solution. Rather than define the issue as one of accounting for complementary but logically different processes (i.e., personal and interpersonal), as Rogoff did, Gal’perin recast it: At heart, it is a question of how overt material action, jointly engaged in, is transformed into covert, individual mental action. Gal’perin’s approach, Stetsenko and Arievitch (1997) argued, points the way toward a possible synthesis of these two versions of post-Vygotskianism.

Stetsenko and Arievitch (1997) offered a plausible solution to the post-Vygotskian, postmodernist dilemma of what to do with self. Unfortunately, as I indicated earlier, there is a problem associated with their solution, a problem that Vygotsky himself wrestled with near the end of his life. Stated baldly, the problem is this: In their attempts to solve one dualistic problem, mind versus world, Stetsenko, Arievitch, and the discourse-based social constructivists have opened up another, potentially more intractable one, the dualistic separation of process and content. William James (1890/1950), more than 100 years ago, complained about psychologists’ tendency to fall into this trap, particularly with regard to cognition: “The psychologist’s attitude toward cognition,” he wrote, represents “a thoroughgoing dualism. It supposes two elements, mind knowing and thing known, and treats them as irreducible” (p. 218).

### THE PROCESS–CONTENT DISTINCTION

As previously indicated, dualism in all its guises is roundly criticized by both Dewey (1952/1989b) and the postmodernists. Equally evident is the fact that these theorists profoundly disagree about how best to deal with this problem. Rorty (1979), I have argued, opted for a surgical strike: Abandon the search for truth, he wrote. This move, in turn, means abandoning the epistemological pro-

ject. Once epistemology is gotten over, all dualist hand wringing is rendered moot. Reform-minded modernists like Peirce, Dewey, and, I submit, Vygotsky, took a different tack. The first two, in particular, felt that it was possible to reformulate or recast dualist distinctions such as mind–world, subject–object, and process–content in new and more productive ways. Sleeper (1986), a prominent Deweyan scholar, characterized Dewey’s thinking this way:

Rorty goes off the rails when he takes as a consequence of pragmatism that we can at last forget about metaphysics and epistemology. That is not at all the point of its antifoundational stance, it seems to me. What we should be doing, as a consequence of pragmatism, is assigning new functions to these old disciplines, not dismissing them altogether. (p. 2)

It is possible to redefine knowledge and truth (i.e., as tentative) in a way that *integrates* previously antagonistic dualisms. This was Dewey’s lifelong goal, and it became an important goal for Vygotsky near the end of his life. Naturalizing human consciousness, bringing mind into world and world into mind, Kozulin wrote (1990, p. 100), was a central concern for Vygotsky from 1928 on.

The approach favored by Dewey, Peirce, and Vygotsky was comprehensive. Dewey’s views, it is not widely known, were strongly influenced by the theorizing of Peirce. The latter was the first philosopher to make inquiry the focal point in logic. Inquiry, as Peirce defined it, and as Dewey later came to talk about it, was expansive enough to break down all of the major dualistic distinctions plaguing philosophy to that point. Before elaborating on the approach developed by Peirce and Dewey, and sketched out by Vygotsky near the end of his life, more needs to be said about the process–content problem as it relates to the three versions of social constructivisms discussed by Stetsenko and Arievitch (1997).

### Process–Content in Discourse-Based Approaches

Truth, according to the discourse-based view, represents nothing more than a successful move in the language game. The ability to make such a move, in turn, varies as a function of one’s persuasiveness, which creates another kind of problem. Process takes precedence over substance or content. Gergen (1994) acknowledged this limitation in the discourse-based approach. “All that was content stands open to critical analysis as persuasive form,” he wrote, which displaces attention “from the object of representation (the ‘facts,’ the ‘rationality of the argument’) to the vehicle of representation” (p. 41).

Gergen (1994), as the previous quote indicates, readily conceded that postmodernist psychologists have made little headway against the process versus content distinction criticized by James (1950). Far from being troubled by this limitation, however, advocates of the discourse-based approach make a virtue out of the shift from “object” to “vehicle.” Language, Gergen argued, can only be judged relative to a process, not a content criterion. The latter reflects an outdated, modernist view of language as a “container” or “holder” of knowledge and meaning. The function of language is to manage or coordinate various forms of human relatedness: “Words are, after all, passive and empty—simply sounds or markings of no consequence. Words are active insofar as they are employed by persons in relationships, insofar as they are granted power in human interchange” Gergen wrote (p. 47). Language is thus assigned an instrumental value.

Certain ways of talking prevail because they are associated with useful ways of interacting. Gergen (1994) argued, “To appraise existing forms of discourse is to evaluate patterns of cultural

life," (p. 53). Characterizing aberrant behavior as mental "illness," for example, will continue as long as people associate it with a desirable pattern of behavior (e.g., treating abnormal individuals in a kinder or gentler way). If this should change, if people should come to view mental illness language as counterproductive, perhaps because it lessens individual responsibility, then new ways of talking will spring up. Language, discourse, is viewed as a tool to promote action—a device for communal coordination, to use Gergen's terminology. This highlights the process function of language at the expense of its content function. More to the point, it widens the gap between process and content. Rogoff's (1997) approach is open to the same charge, as is Gal'perin's (1989).

### Process–Content in Post-Vygotskian Theory

Rogoff (1997) assumes an outside perspective in describing the actions of individuals participating in communal practice. Everything one would want to know about someone's learning and development can be gotten by carefully observing how that individual participates in sociocultural activity. It is for this reason that she responds favorably to a quote by Wertsch and Stone to the effect that, for theorists like herself, the "process is the product" (Rogoff, 1997, p. 272). Rogoff argued that, in her orientation to learning and development, process is out in the open, obviating the need to posit "mental objects" like strategies, scripts, or plans. (As Wertsch and Rupert, 1993, pointed out, strategies and scripts play a key role in the U.S. version of sociocultural theory.)

By equating learning with the process of participation in sociocultural activity, Rogoff (1997) avoids the outside–in, cognitive strategy pitfall that plagues many socioculturalists (cf. Hatano, 1993). What she has *not* been as successful at doing is putting to rest the process–content distinction that afflicts postmodern and, I submit, post-Vygotskian views of learning. One certainly can make this claim about Gal'perin's work. The process–content distinction evidences itself in slightly different ways at each stage in the formation of a mental action. This distinction also characterizes the overall process, as witnessed in this statement by Gal'perin (1989):

We must distinguish between the objective content of an action as a system of objective relations to be realized and the actual concrete action of the subject who realizes them under different sets of conditions. The real action of the subject includes these objective relations, but they represent requirements that must be met by the final product of the action rather than the content of the process that actually produces that product. (p. 47)

According to Gal'perin (1989), the process–content distinction is key in the first, planning stage when a model of the intended action is developed. It is important that the individual carefully attend to attributes in the material to be acted on. These features, to a great extent, determine whether or not the action will be performed correctly. Zinchenko (1996) captured this notion well when he commented that, for Gal'perin, it "was not human relations but the force of things that was internalized" (p. 290). Attention to the so-called "markers" embedded in material lays the foundation for the next important stage in the process, "materializing" the action.

There are two ways to engage in the materialization process, according to Gal'perin (1989), both of which promote the understanding necessary to take the action underground, as it were (i.e., transform it from covert to overt action). The first, described as *expanding the action*, involves breaking the process down into its separate components. The second, termed *generalization of an action*, takes an outward, content orientation. Here the properties of things to which the action is



applied are made more explicit. The result is an appreciation of how the *instruments of an action* are connected to “those properties of things to which an action is to be applied” (Gal’perin, 1989, p. 51).

In the third stage of the process spelled out by Gal’perin (1989), material action is converted into verbal speech, with only the most essential aspects of action “passing” into speech. Elements of the action recede from consciousness at this stage. Still, even in its abbreviated form, mental action continues to be controlled by properties of the task. As Gal’perin put it, “It is determined by the ‘tendency’ emanating from the task,” which, he added, eventually becomes a kind of “conditioned stimulus” associated with the action (p. 55). These properties, however, are now dependent on speech for their instantiation.

Gal’perin’s (1989) dualistic approach to action is evident in another broad distinction he makes, that between the operative action itself, the actual carrying out of some planned sequence of moves, and the action of checking or monitoring that action. “The model for checking,” Gal’perin wrote, “is given materially in the form of an object or a standard that is applied against the results of the operative action” (p. 57). In other words, actions are checked against expected outcomes (i.e., anticipated transformations in material). This process, although a part of all action, is most salient in the case of mental action—largely because that action is covert. When both action and outcome are imagined, the latter is more vivid: “We see in our minds only the objective content of the action,” Gal’perin wrote, “we do not see our action that realized this content” (p. 60). This quote makes it obvious that Gal’perin is no further along than Gergen and Rogoff in solving what arguably is the most intractable problem facing postmodernists, that of overcoming the yawning gap between process and content in learning and cognition.

## DEWEY, VYGOTSKY, AND THE PROCESS–CONTENT DISTINCTION

Vygotsky was well aware of the work of the American pragmatists; in fact, it is likely he met with Dewey when the latter visited Moscow in 1928.<sup>1</sup> Regardless of whether or not a meeting took place, Vygotsky and the American pragmatists clearly were moving in tandem in their thinking to-

<sup>1</sup>There is a good possibility that such a meeting took place (Prawat, 1998a), a statement that requires some elaboration. Dewey’s host during his visit to Moscow was a Bolshevik luminary named Anatoly Lunacharsky, Commissar of Art and Education and an ardent follower of the prominent German pragmatist, Ernst Mach (Hiebert, 1976; Myers, 1986). Dewey also spent time in Moscow with N. K. Krupskaya, Lenin’s widow. Kozulin (1984) characterized her as a strong advocate of Deweyan project-based, child-centered curriculum. Dewey visited one of Krupskaya’s project-based schools during his Moscow visit (Dewey, 1928/1984a, p. 247; Fitzpatrick, 1970).

Lunacharsky and Krupskaya were criticized for pushing their “own new brand of psychology” (McLeish, 1975, p. 160). In this connection, there is evidence that they provided unusual support and political protection for members of the so-called Kornilov school, a group dominated by Vygotsky that was intent on developing an alternative to “objective,” behaviorist psychology (cf. Joravsky, 1989, pp. 355–359). Krupskaya, for example, headed up the Academy where Vygotsky, as chief scientist, did his most important work (van der Veer & Valsiner, 1991, p. 185). As head of the scientific-pedagogical section of the Commissariat, Krupskaya also made sure that Vygotsky’s work was widely disseminated.

Lunacharsky and Krupskaya were ousted in the 1930 Stalinist purge of Machian and other “rightist” intellectuals (Bauer, 1952). Vygotsky was attacked shortly after his patrons came under fire; like them, he was accused of playing a key role in the attempt to “smuggle in” ideas from U.S. and German psychology (McLeish, 1975, p. 124). Dewey (1932/1985), safely back in the United States, lamented this development, which he equated with the dismissal of Lunacharsky, characterizing it as a move “definitely away from the cultural in the direction of the technical” (p. 291). In light of the Dewey–Lunacharsky–Krupskaya–Vygotsky connection, it does seem likely that Vygotsky was included among the “leading Russian professors” Dewey reports having met with during his 2-week stay in Moscow (*New York Times*, 1928, July 22).

ward the end of Vygotsky's life. Both had decided to highlight meaning: Meaning, they agreed, has its origins in sentient, richly embodied thought which is then worked into language. Meaning, as viewed by Dewey and Vygotsky, is an interesting hybrid, part process (i.e., speech) and part pure content (i.e., imagination). Defining meaning in this way finesses the process–content distinction. The American pragmatists were also explicit about the fluidity of meaning. Meaning, to use Dewey's phrase, is not bound by the skin. It moves freely out into the dialogic space between people and also between mind and physical world. In this way, meaning, as viewed by Vygotsky and the pragmatists, avoids the dualistic mind–world, subject–object constraints associated with other approaches.

### Peirce and Dewey

Before tracing Vygotsky's intellectual odyssey (from sign–action to meaning), more needs to be said about the work of Dewey and Peirce. While Vygotsky was still a student at Moscow University (i.e., 1915), Dewey was completing an important phase of his own intellectual odyssey, throwing off the last vestiges of Jamesian pragmatism while simultaneously putting on the Peircean mantle. As I have documented in a recent paper (Prawat, 1998b), Dewey was troubled by two important aspects of the pragmatic approach he had co-constructed with James: The first was its focus on the individual; the second, closely related issue, was its reliance on inductionism as a mechanism of learning. Dewey, thanks to critics like Royce and Bradley (cf. Thayer & Thayer, 1978), realized there were strings attached to these two commitments.

Peirce's (1931, Vol. 1) pragmatic maxim that the meaning of a belief or idea lies in its discernible effects had been given an individualistic twist by James (Prawat, 1998b). James interpreted the maxim to mean that ideas are judged relative to what they do for and to the individual—whether they satisfy his or her needs or fulfill other idiosyncratic expectations. This interpretation had come under increasing criticism by 1910. The fact that ideas satisfy personal needs does not make them true, critics pointed out; they must also meet certain objective (i.e., public) criteria. Consistent with the focus on individual outcomes, James and Dewey (1903/1976) also entertained an inductionist, which is to say, a fact to generalization view, of knowledge acquisition. Induction is the process, James wrote, whereby generalization naturally works “itself free from all sorts of entangling particulars” (cf. Seigfried, 1990, p. 169). This approach seemed more and more improbable to Dewey. Enter Peirce—or, rather, re-enter Peirce (Dewey had taken a class from Peirce when he was a doctoral student).

Peirce, described by Fisch (1980) as “the most original and versatile intellect that the Americas have so far produced” (p. 7), is credited with having coined the term *pragmatism*. Despite a troubled career, it was Peirce and not his better known colleagues, James and Dewey, who developed the most comprehensive theory of pragmatism. (Dewey, 1985, in fact, paid homage to Peirce in 1932, calling him a “philosopher's philosopher” and one of the most imaginative thinkers ever in philosophy.) Peirce drew a sharp distinction between induction, which he said seeks out fact, and *abduction*, a process which he felt was ideally suited to seek out new theory (1958, Vol. 7, p. 137). Abduction is a creative process; it thus differs from induction which represents an act of self-control. The latter cannot give rise to ideas, according to Peirce, although it—along with deduction—can guide the process of idea verification (1934, Vol. 5, p. 120).

The process of idea generation posited by Peirce represents a highly imaginal, metaphoric leap into the unknown. Recent studies show that Peirce's way of characterizing the process is more consistent with scientific discovery than the traditional view held by James and the early Dewey (cf. Miller, 1987; Moore & Robin, 1994). This is not surprising given the fact that Peirce based his idea about abduction on his own careful study of famous scientists like Pasteur and Kepler. Dewey, who turned to Peirce in search of a way out of the Jamesian individualistic/inductionist trap, quickly came to see the value in Peirce's approach. Peirce's unique contribution, Dewey (1935/1987) argued, is his highly "original theory of the relation [in thought] between the existential [i.e., qualitative] and the logical" (p. 89).

Peirce's theory highlights the role of meaning but assumes it is not coextensive with language. Ideas arrived at abductively are expressed in words but are not synonymous with them. As Peirce wrote, somewhat cryptically, "Men and words reciprocally educate each other" (1934, Vol. 5, p. 189). Dewey (1946/1989a) elaborated on the creative tension between word and meaning hinted at by Peirce: Linguistic behavior "supervenes" on other, more qualitative ways of knowing, Dewey wrote, and in so doing also "intervenes," helping to raise understanding to "the plane of reasonableness" by pushing individuals to attend to the most generalizable aspects of the meaning being created (p. 149). Vygotsky, as I will soon point out, developed a very similar notion.

All three theorists—Peirce, Dewey, and Vygotsky—sought to avoid the either/or thinking that underlies the dualisms mentioned above: mind versus world, subject versus object, and process versus content. These dualisms were addressed by Peirce and Dewey in an ingenious way. Both idea generation and idea verification involve public *and* private knowledge, they argued. Both also occur within *and* without the human mind. Finally, Peirce and Dewey insisted, meaning making is an embodied or "existential" activity. This element of thought is not an add-on; it is part and parcel of one's understanding of objects and events in the world. Einstein's thought experiments were thus at the core of his brilliant insights into nature (cf. Miller, 1987). The merger or welding together of content and process early on negates the notion that thought and subject matter somehow go their own way (Dewey, 1891/1969, p. 128). Dewey (1938/1986) expressed the notion this way: "Rational operations grow out of organic activities" (p. 26).

Focusing on the public-private, objective-subjective knowledge issue first, Peirce (1934, Vol. 5) made it clear that he thought these two ways of knowing were implicated in both the generation and verification aspects of disciplined inquiry. Abduction, which might be tagged a subjective or private process, does not take place in a vacuum; it originates against a background of widely held, public views. The same mix of knowledge is found during hypothesis formation and idea verification. New ideas must contend with but must also come to terms with existing views if they are to receive a hearing. This second requirement reflects a very real constraint. New ideas cannot be developed without making reference to old ones. Dewey (1922/1983) came to view the tension between public, tried and true ways of thinking about things and the new, often troubling insights offered up by adventurous individuals as healthy when neither totally predominates. He defended his middle ground position this way: "There is an alternative between anchoring a boat in the harbor till it becomes a rotting hulk and letting it loose to be the sport of every contrary gust" (p. 117).

Peirce and Dewey resolved the "locational" mind versus world issue in a similar way. One cannot assume that the verification process is social and thus in the world, they argued. In fact, the second or "indexical" stage of idea development is located primarily in the world—or, at least, in the interaction between individual mind and world. Peirce explains what he means by this: Intuiting a new set of possibilities is only the starting point. Possibility must be checked against ac-

tuality. Regardless of how the idea arises, or what becomes of it in the future, it must fulfill its primary obligation—that of opening up new aspects of the world. An idea is worthless, Dewey (1929/1984b) wrote, if it cannot fulfill this role (p. 111). It is thus incumbent on the individual to immediately take stock of how well the idea, in schematized or “skeletonized” form (Peirce, 1932, Vol. 2, p. 124), delivers on its initial promise. Even in the case of brilliant insights, the reality check stage of the idea construction process is bound to yield mixed results. Some of the detail in the situation must be ignored in the interest of developing an overall understanding. Ideas, however, being blunt instruments, may not pick up all the detail that is needed if one is to develop a deeper, more nuanced understanding of the object or event in question. In the latter case, the idea must be changed or amended so that it is more responsive to the unanticipated detail in the future.

The reality check actually occurs at two points, according to Peirce and Dewey: At a midway point in the idea generation process, after the insight stage but before the idea can be translated into words, and later when, as a public, statable hypothesis, the idea is taken up by other members of the community (cf. Prawat, 1999). Dewey (1938, 1986) wrote, “Conclusions that are announced by an individual inquirer have the status of an hypothesis, especially if the findings fail to agree with the general trend of already accepted results” (p. 484). At this point, verification is a hybrid within- and between-minds sort of process. The two sets of distinctions—mind–world and private–public—thus break down according to Dewey (1916/1980): “When the activities of mind set out from customary beliefs and strive to effect transformations of them which will in turn win general conviction, there is no opposition between the individual and the social [or the mental and the dialogic]” (p. 306). Thought, in this approach, is both within and without the individual. For this reason, Peirce wrote, it is more apt to say that we are in thought rather than thought is in any of us (Peirce, 1958, Vol. 8, p. 189). This is remarkably close to the formulation that Vygotsky arrived at near the end of his life.

## Vygotsky

As suggested, there is evidence, based on previously unpublished papers and notes by Vygotsky (1997a; 1997b; 1997d), that Vygotsky’s way of dealing with the dualistic issues outlined above closely resembles the approach taken by Peirce and Dewey. This last point obviously requires some elaboration. It might be helpful to briefly trace the development of Vygotsky’s thinking, paying particular attention to the last 3 years of that odyssey. Here I rely heavily on scholars like Minick (1997), Bakhurst (1991), Kozulin (1984), and Yaroshevsky and Gurgenidze (1997). The last two individuals have written a very insightful piece in the latest volume of Vygotsky’s work, tracing the development of his thinking right up to his death. They chart Vygotsky’s growing disenchantment with sign-mediated self-regulation as an approach to mind and consciousness. This view, which he had hit on early in his career, now seemed excessively sterile to Vygotsky.

As Yaroshevsky and Gurgenidze (1997) explained, Vygotsky decided to abandon the process approach he had adopted in favor of one that dealt with the internal dynamics of meaning making. They wrote, “The idea according to which meaning forms an organic component of individual consciousness had far-reaching consequences, this is the turning point which separates the preceding period of Vygotsky’s creative career from what we are examining now” (p. 352). Kozulin (1984) agrees and points to the last chapter of Vygotsky’s (1986) book *Thought and Language*, which he dictated on his deathbed, as evidence of how much Vygotsky’s views had changed at the end of his life.

The “turning point” referred to by Yaroshevsky (1996) and Kozulin (1990) was signaled by a startling admission contained in unpublished notes found in Leont’ev’s private archives. Vygotsky (1997d) admitted, “In older works we ignored that sign has meaning”. He had discounted meaning before: “Whereas before our task was to demonstrate what ‘the knot’ and logical memory have in *common*, now our task is to demonstrate the difference that exists between them” (pp. 130–131). The knot helps the individual regulate the memory process. Speech plays the same kind of role, Vygotsky thought before his latest epiphany. In the period from 1930 to 1932, Vygotsky began to have second thoughts about this solution. He realized that sign-induced cognitive self-regulation—a process—does not necessarily connote intellectual substance or content.

Yaroshevsky and Gurgendize (1997) described the shift in Vygotsky’s thinking as he moved from a focus on process, albeit speech-regulated, to an approach that increasingly tried to wed content with process. The first phase of Vygotsky’s work is well known. Here he highlighted a complex new unit, the speech reflex, arguing that one unique advantage it enjoys is that it is reversible: That is, it can function as both an internal and an external stimulus. In the former capacity, it sets in motion an underground process that eventually allows the individual to gain control over his or her own behavior—paving the way for the emergence of more complex acts like voluntary attention. Word “reflex-stimuli” were the “psychological tools” that make this transformation in process possible.

Vygotsky no sooner arrived at this point, Yaroshevsky and Gurgendize (1997) argued, then he began to entertain doubts about the viability of his approach. “The attempt to understand the character of the interrelations between the different mental processes made Vygotsky think about the instrumental role of the word in the formation of the functional systems” (p. 351). The key term here was “system.” Vygotsky decided that separate mental functions like perception, will, and feeling must be somehow dynamically connected, bound together in a “mental substrate” formed by consciousness. “The next period in Vygotsky’s scientific search,” Yaroshevsky and Gurgendize wrote, “was connected with the program he developed to study consciousness as a systemic and semantic structure” (p. 351).

Traditional functionalism, unfortunately, had little to say about the issues Vygotsky wanted to address: How the various functions relate one to the other, how they relate to external phenomena—objects and events in the world—and how all of this translates into the substantive experience known as meaning. This last issue, Vygotsky realized, was the key to understanding consciousness. Meaning making was seen as the core activity of consciousness. This was a novel and controversial idea in Russia, and one which Vygotsky largely kept to himself. As Yaroshevsky and Gurgendize (1997) explained, “Such a perspective revealed the idea that the tissue of consciousness is built from meanings, that it is the sphere of meanings and not signs that the factors which change the interfunctional relationships are operative” (p. 353). Peirce and Dewey, of course, had already arrived at this conclusion. Dewey (1925/1981), in fact, sounding very much like Vygotsky, wrote, Consciousness “denotes awareness or perception of meaning; it is the perception of actual events, whether past, contemporary or future, *in their meanings*” (p. 230).

Given the criticism that the guardians of Pavlovian behaviorism had directed toward his earlier ideas about signs (Joravsky, 1978, p. 124), it is not surprising that Vygotsky (1997d) hesitated to share his views about the centrality of meaning. His thinking in this regard is only now beginning to surface. Be that as it may, highlighting the role of meaning provided Vygotsky with the strongest weapon yet in his long-standing battle against the dualist distinction between mind and body. Minick (1997) is helpful here. He pointed out how Vygotsky was able to use the meaning construct

to attack one version of the mind–body dilemma, namely mind–behavior. Luria (1979, p. 165) referred to this second dilemma as the “psychophysical paradox.” Defined as the problem of accounting for how signs influence action or words influence movement, it truly was a paradox during the self-regulation phase of Vygotsky’s work. Del Rio (1992) criticized Vygotsky for leaving this issue unresolved. As a result, he argued, his followers were left with “a process behind which there was no more than the word itself” (p. 25). Del Rio has a legitimate complaint, but misrepresents the situation when he accuses Vygotsky of avoiding the sign–action problem because of “excessive timidity.” Vygotsky simply lost interest in the sign–action way of defining the problem.

Vygotsky (1997d) realized that the sign–action perspective was less adequate than the one he ultimately adopted, an approach which puts meaning front and center. Meaning enjoys a unique advantage in dealing with the mind–behavior problem, Minick (1997) argued. It can function, at one and the same time, as a unit of social interaction (i.e., a unit of *behavior*), and as a unit of thinking (i.e., a unit of *mind*). Restated, meaning can exist in two places: In the dialogic space between people, and, as a “unit of thinking,” in the transactional space between the individual and the world of objects and events. It is this flexibility, I submit, that makes meaning a viable construct for effecting a synthesis between the Rogoff and Gal’perin, *intersubjective* and *intrasubjective* versions of post-Vygotskianism.

The meaning construct also enjoys an enormous advantage when it comes to dealing with a more vexing distinction, that between process and content. Vygotsky (1997d) seemed fully aware of this fact, judging from the notes of a long talk he gave just before his death. Vygotsky explained once again in this talk why psychologists could no longer ignore the problem of consciousness. Consciousness is at the core of all cognitive functions: It “determines the fate of the functions,” he stated (p. 130). Vygotsky was moving toward a view that equates consciousness with awareness of meaning, a perspective that closely paralleled the thinking of pragmatists like Peirce and Dewey. This is not accidental, as previously indicated.

Like the pragmatists, Vygotsky now had a firm fix on the origin of thought. (These ideas are made explicit in the previously unpublished notes referred to above and in the last chapter of his classic book, *Thought and Language*, 1986. In fact, the obvious difference in view expressed in Chapter 5 and Chapter 7 of this book capture well the almost frantic changes in thinking Vygotsky underwent near the end of his life.) Thought flows through several phases or stages, Vygotsky came to believe. It originates as a kind of “sense” of the way things are or might be, assuming a very visual or imagistic form.<sup>2</sup> An idea, Vygotsky (1991) wrote elsewhere, begins as the concrete construction of a new image (p. 87). This sentient way of knowing is far from finding its way into words, however. Vygotsky (1986) cautioned, “thought has its own structure, and the transition from it to speech is no easy matter” (p. 250).

The path from thought to word is through meaning. Vygotsky (1986) wrote, “Thought must first pass through meanings and only then through words,” (p. 252). Meaning is extracted, as it were, from an idea that exists in inchoate form. This process cannot be bypassed: Vygotsky (1997d) added, “Meaning is not the same as thought expressed in words,” (p. 134). One does not automatically go from sense to verbal expression: “The thought has another structure besides its verbal expression,” (p. 134), Vygotsky stated, somewhat cryptically in his December 1933 talk.

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<sup>2</sup>This was the exactly the point that Stalin later took issue with: “Bare thoughts, free of the language material ... do not exist,” Stalin insisted, which explains why Vygotsky’s work was in such disfavor (cf. Graham, 1993, p. 106). Stalin had a vested interest in this position inasmuch as he was confident that he could control language.

This structure—and, by implication, the process of meaning construction itself—is equivalent to the “internal structure of the sign operation” (p. 133). What Vygotsky has in mind here appears to be very similar to what the American pragmatists had in mind: A process that mediates between holistic, imaginal thinking and the instantiation of that thinking in a verbal format.

Vygotsky entertained a view that is similar to Peirce and Dewey’s about what happens during the thought to word process. Individuals try to pull out what is most general about an object’s meaning from the welter of specific and unique detail. Kozulin, paraphrasing Vygotsky, used terms familiar to most cognitive psychologists to describe what goes on at this point in the meaning construction process: “In the act of thinking,” Kozulin (1990) wrote, “the object is constantly assimilated by thought (i.e., the general idea), only to require a moment later an accommodation on its part” (p. 268). This dialectic between stable and precarious elements of meaning is the mother’s milk of understanding, Vygotsky and the pragmatists believe; it is part and parcel of the meaning making process. As Vygotsky (1997d) explained in his 1933 talk, “To know the meaning is to know the singular as the universal,” (p. 136). Dewey elaborated on the value of this more general knowledge: “Generalizations do not merely grow out of determination of singulars,” Dewey (1938/1986) insisted, “they constantly function in further interpretation of singulars” (p. 434).

An object or event’s meaning is parsed into its stable and precarious elements, in Vygotsky’s scheme. This occurs as part of the give and take when sense confronts reality. There is a further parsing of meaning when the individual is forced to put words to the product of this give and take. Vygotsky (1997d) used a powerful metaphor to describe the overall process: “Thought is a cloud from which speech is shed in drops” (p. 134). Meaning making, if one stays with the metaphor, is what goes on inside the cloud: The process leading to the condensation of water vapor is akin to the process that pulls more focused meaning out of vague understanding; the process that shapes condensed water into rain droplets is akin to that which converts parsed meaning into speech. Vygotsky (1997d) stated, “Meaning is not equal to the word, not equal to the thought,” (p. 133). The fact that meaning, for Vygotsky, was neither speech, which is mostly process, nor inchoate thought, which is pure content, freed it up to be both, which was his great breakthrough (shared with the pragmatists). Meaning, Vygotsky believed at the end of his life, is in equal measure both process and content—both “communication and generalization” to use Vygotsky’s somewhat strange terminology. “The internal side of mediation,” Vygotsky insisted, “is revealed in the double function of the sign: (1) communication, (2) generalization” (p. 138).

Vygotsky thus entertained one final shift in thinking in his short but productive career as a psychologist. Few scholars—with the exception of Yaroshevsky (1996) and Kozulin (1990)—appreciate how dramatic a shift this was.<sup>3</sup> Vygotsky, like his pragmatist counterparts in the United States, sought to resolve one of the most vexing issues confronting scholars in his discipline, the separation of content and process. Although his ideas were, at best, incompletely developed in the few years he was able to devote to this issue, Vygotsky does point the way toward a solution that closely parallels the one offered by Dewey and Peirce in the United States and Ernst Mach (cf. Hiebert, 1976) in Austria: The notion that ideas originate as embodied, imaginal thought which is then carried out in the

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<sup>3</sup> These two individuals, along with van der Veer and Valsiner (1991), are in the best position to track Vygotsky’s change of mind. Mikhail Yaroshevsky, a professor who specializes in the history of science, is a chief scientist for the prestigious Russian Academy of Sciences. He authored the definitive Russian biography on Vygotsky. Kozulin got his doctorate at the Moscow Institute of Psychology, Vygotsky’s professional home from 1924–1934. Kozulin’s 1984 study of Soviet psychology is considered the most authoritative in recent times.

world and sharpened and refined by the reality it encounters. The product of this back and forth process is then put to words. In this last stage, meaning enters the social domain where it is further refined, and “situated” or “located” in the community’s corpus of shared knowledge.

Vygotsky did not have time to fully develop what Dewey (1946/1989) referred to as the “sociological” aspect of the theory (p. 151). Dewey used this shorthand to refer to Peirce’s notions about the role of community in scholarly inquiry. In a previously unpublished treatment of scientific inquiry, however, Vygotsky (1997b, pp. 248–253) does sound very much like Peirce (1934, Vol. 5, p. 186) in this regard. Like his pragmatic counterpart, Vygotsky clearly distinguished between the abductive process that leads to the creation of new concepts or ideas, and the deductive–inductive process that results in those concepts being tested or verified. The striking parallel between Vygotsky’s thinking and that of the American pragmatists regarding the process of idea generation has already been highlighted. (“Thinking in concepts develops in the biological realm of functions and processes,” insisted Vygotsky, 1997b, p. 168.) Vygotsky (1997b) described this leap of imagination as a special kind of induction (a “new induction”; p. 252).

More to the point, Vygotsky, like Peirce, emphasized the centrality of the concept (or “idea”) in scientific inquiry (Vygotsky, 1997b, p. 251). “In concepts we find the unity of form and content,” Vygotsky (1997a) wrote in yet another unpublished manuscript (p. 101). The concept, Vygotsky added, sounding very much like Peirce and Dewey, “is the knowledge of the object in its *relations* [italics added], in its connections” (p. 100). This last point is key in understanding the pragmatic approach to scientific inquiry. All logical analysis, Peirce and Dewey argued, is made up of relations. Logical relations do not express a priori modes of thinking, as many philosophers believe; rather they capture predictable regularities in our interactions with the world. For inquiry purposes, these relations are expressed propositionally as connections between subjects and predicates. The statement “All men are mortal,” for example, translates into the relational statement, “*If anything whatever is human [subject], then that thing is mortal [predicate].*”

The explication of relations mentioned above, in the standard “if–then” propositional format, is the joint responsibility of the individual and the community, Vygotsky suggested (1997b). The process begins with an act of classification—“assigning a singular phenomenon to the class of similar phenomena” (p. 250). Here Peirce and Dewey agreed. Once the phenomenon of interest, the subject in the subject–predicate relationship, has been “located” as it were, attention turns to its explication. This involves deduction: “The method of analysis in the natural sciences,” Vygotsky wrote, “consists of the study of a single phenomenon, a typical representative of a whole series, and the deduction of a proposition *about the whole series* on the basis of that phenomenon” (p. 317). Here again Vygotsky sounds eerily like Peirce, who argued that we deduce predictions from the hypothesis and then test these by observation or experiment through the process of induction. Peirce contrasted the three processes involved in inquiry this way: “Hypothesis [abduction] gives us our facts. Induction extends our knowledge. Deduction makes it distinct” (cf. Parker, 1998, p. 9).

It might be helpful to provide an example of what Vygotsky and Peirce are talking about here. Darwin, in a great abductive leap of imagination, equated man selecting for the purposes of animal breeding with the hypothetical process of nature selecting (Ghiselin, 1969). Darwin had no trouble locating the subject, thought to be a universal attribute of nature, or the predicate for that matter, which assumes a certain pattern in the fossil record. Constructing a workable hypothesis out of his great insight, of course, was more problematic. As suggested above, the pragmatists consider



this to be a shared, individual and community responsibility—as was the inductive process of extending the hypothesized relationship to new fossil phenomena.

Vygotsky's views about scientific inquiry toward the end of his life were surprising similar to Peirce's. Would Vygotsky, with a longer life, have emulated Dewey, who broadened Peirce's theory of inquiry to encompass nearly all aspects of human meaning-making (Prawat, in press)? It is impossible to say. What is evident, however, is that Vygotsky, Peirce, and Dewey all converged on a solution to a set of epistemological and ontological concerns in the early 1930s that is worth reexamining now, at the turn of the century. This commonality of perspective is not as surprising as it sounds. Vygotsky was knowledgeable about Dewey's work (Prawat, 1998). His interest in Joshua Royce's work (Valsiner & van der Veer, 1988) would also have inclined him toward a study of Peirce (Royce, 1988, popularized many of Peirce's ideas). All three scholars were caught up in a common pursuit, connecting the disciplines of psychology and philosophy to the real physical and social world.

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### REFERENCES

- Arievitch, I., & van der Veer, R. (1995). Furthering the internalization debate: Gal'perin's contribution. *Human Development*, 38, 115–126.
- Bakhurst, D. (1991). *Consciousness and revolution in Soviet philosophy*. Cambridge, England: Cambridge University Press.
- Bauer, R. A. (1952). *The new man in Soviet psychology*. Cambridge, MA: Harvard University Press.
- Cobb, P. (1994). Where is mind? Constructivist and sociocultural perspectives on mathematical development. *Educational Researcher*, 23(7), 13–20.
- Cole, M. (1996). *Cultural psychology: A once and future discipline*. Cambridge, MA: Harvard University Press.
- Del Rio, P. (1992). Extra-cortical connections: The sociocultural systems for conscious living. In J. V. Wertsch & J. D. Ramirez (Eds.), *Explorations in socio-cultural studies: Vol. 2. Literacy and other forms of mediated action* (pp. 19–30). Madrid, Spain: Fundacion Infancia y Aprendizaje.
- Dewey, J. (1969). The present position in logical theory. In J. A. Boydston (Ed.), *John Dewey: The early works, 1889–1892* (Vol. 3). Carbondale: Southern Illinois University Press. (Original work published 1891)
- Dewey, J. (1976). Studies in logical theory. In J. A. Boydston (Ed.), *John Dewey: The middle works, 1899–1924* (Vol. 2). Carbondale: Southern Illinois University Press. (Original work published 1903)
- Dewey, J. (1980). Democracy and education. In J. A. Boydston (Ed.), *John Dewey: The middle works, 1899–1924* (Vol. 9). Carbondale: Southern Illinois University Press. (Original work published 1916)
- Dewey, J. (1981). Experience and nature. In J. A. Boydston (Ed.), *John Dewey: The later works, 1925–1953* (Vol. 1). Carbondale: Southern Illinois University Press. (Original work published 1925)
- Dewey, J. (1983). Human nature and conduct. In J. A. Boydston (Ed.), *John Dewey: The middle works, 1899–1924* (Vol. 14). Carbondale: Southern Illinois University Press. (Original work published 1922)
- Dewey, J. (1984a). Impressions of Soviet Russia. In J. A. Boydston (Ed.), *John Dewey: The later works, 1925–1953* (Vol. 3, pp. 203–250). Carbondale: Southern Illinois University Press. (Original work published 1928)
- Dewey, J. (1984b). Quest for certainty. In J. A. Boydston (Ed.), *John Dewey: The later works, 1925–1953* (Vol. 4). Carbondale: Southern Illinois University Press. (Original work published 1929)

- Dewey, J. (1985). Charles Sanders Peirce. In J. A. Boydston (Ed.), *John Dewey: The later works, 1925–1953* (Vol. 6, pp. 273–277). Carbondale: Southern Illinois University Press. (Original work published 1932)
- Dewey, J. (1986). The logic of inquiry. In J. A. Boydston (Ed.), *John Dewey: The later works, 1925–1953* (Vol. 12). Carbondale: Southern Illinois University Press. (Original work published 1938)
- Dewey, J. (1987). Peirce's theory of quality. In J. A. Boydston (Ed.), *John Dewey: The later works, 1925–1953* (Vol. 11, pp. 86–94). Washington, DC: American Psychological Association. (Original work published 1935)
- Dewey, J. (1989a). Oeource's Theory of linguistic signs, thought, and meaning. In J. A. Boydston (Ed.), *John Dewey: The later works, 1925–1953* (Vol. 15, pp. 141–152). Washington, DC: American Psychological Association. (Original work published 1946)
- Dewey, J. (1989b). Modern philosophy. In J. A. Boydston (Ed.), *John Dewey: The later works, 1925–1953* (Vol. 16, pp. 407–419). Washington, DC: American Psychological Association. (Original work published 1952)
- Fisch, M. H. (1980). Foreword. In T. A. Sebeok & J. Umiker (Eds.), *You know my method*. Bloomington, IN: Gaslight Publications.
- Fitzpatrick, S. (1970). *The Commissariat of Enlightenment*. Cambridge, England: Cambridge University Press.
- Gal'perin, P. Ya. (1989). Mental action as a basis for the formation of thoughts and images. *Soviet Psychology*, 27(3), 45–64.
- Gergen, K. J. (1994). *Realities and relationships. Soundings in social constructionism*. Cambridge, MA: Harvard University Press.
- Ghiselin, M. T. (1969). *The triumph of the Darwinian method*. Berkeley, CA: University of California Press.
- Glaserfeld, E. von. (1995). *Radical constructivism*. London: Falmer.
- Graham, L. (1993). *Science in Russia and the Soviet Union*. Cambridge, England: Cambridge University Press.
- Hatano, G. (1993). Time to merge Vygotskian and constructivist conceptions of knowledge acquisition. In E. A. Forman, N. Minick, & C. A. Stone (Eds.), *Contexts for learning. Sociocultural dynamics in children's development*. New York: Oxford University Press.
- Hiebert, E. N. (1976). Introduction. In E. Mach, *Knowledge and error* (pp. xi–xxx). Dordrecht, The Netherlands: D. Reidel. (Original work published 1905)
- James, W. (1950). *The principles of psychology*. New York: Dover. (Original work published 1890)
- Joravsky, D. (1978). The construction of the Stalinist psyche. In S. Fitzpatrick (Ed.), *Cultural revolution in Russia, 1928–1931* (pp. 78–104). Bloomington: Indiana University Press.
- Joravsky, D. (1989). *Russian psychology. A critical history*. Oxford, England: Basil Blackwell.
- Kozulin, A. (1984). *Psychology in utopia*. Cambridge, MA: MIT Press.
- Kozulin, A. (1990). *Vygotsky's psychology. A biography of ideas*. Cambridge, MA: Harvard University Press.
- Lave, J. (1991). Situating learning in communities of practice. In L. B. Resnick, J. Levine, & S. D. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 41–62). Washington, DC: American Psychological Association.
- Leont'ev, A. N. (1978). *Activity, consciousness and personality*. Englewood Cliffs, NJ: Prentice Hall.
- Luria, A. R. (1979). *The making of mind*. Cambridge, MA: Harvard University Press.
- McLeish, J. (1975). *Soviet psychology: History, theory, content*. London: Methuen.
- Miller, A. I. (1987). *Imagery and scientific thought*. Cambridge, MA: MIT Press.
- Minick, N. (1997). The early history of the Vygotskian school: The relationship between mind and activity. In M. Cole, Y. Engestrom, & O. Vasquez (Eds.), *Mind, culture, and activity. Seminal papers from the Laboratory of Comparative Human Cognition* (pp. 117–127). Cambridge, England: Cambridge University Press.
- Moore, E. C., & Robin, R. S. (1994). *From time and chance to consciousness. Studies in the metaphysics of Charles Peirce*. Oxford, England: Berg.
- Myers, G. A. (1986). *William James*. New Haven, CT: Yale University Press.
- Packer, M. (1991). Interpreting stories, interpreting lives: Narrative and action in moral development research. In M. Tappan & M. Packer (Eds.), *Narrative and storytelling: Implications for understanding moral development* (New Directions for Child Development, No. 54, pp. 63–82). San Francisco: Jossey-Bass.
- Parker, K. A. (1998). *The continuity of Peirce's thought*. Nashville, TN: Vanderbilt University Press.
- Peirce, C. S. (1931–1935). In C. Hartshorne & P. Weiss (Eds.), *Collected papers of Charles Sanders Peirce* (Vols. 1–6). Cambridge, MA: Harvard University Press.
- Peirce, C. S. (1958). In A. W. Burks (Ed.), *Collected papers of Charles Sanders Peirce* (Vols. 7–86). Cambridge, MA: Harvard University Press.
- Prawat, R. S. (1998). *Dewey meets the Mozart of psychology: The untold story*. Manuscript submitted for publication.
- Prawat, R. S. (1999). Dewey, Peirce, and the learning paradox. *American Educational Research Journal*, 36(1), 47–76.

- Prawat, R. S. (inpress). The two faces of Deweyan pragmatism: Inductionism versus social constructivism. *Teachers College Record*. Manuscript submitted for publication.
- Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in social context*. New York: Oxford University Press.
- Rogoff, B. (1997). Evaluating development in the process of participation: Theory, methods, and practice building on each other. In E. Amsel & K. A. Renninger (Eds.), *Change and development* (pp. 265–285). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Rorty, R. (1979). *Philosophy and the mirror of nature*. Princeton, NJ: Princeton University Press.
- Rosenau, P. M. (1992). *Post-modernism and the social sciences*. Princeton, NJ: Princeton University Press.
- Royce, J. (1988). In J. E. Smith & W. Kluback (Eds.), *Josiah Royce: Selected writings*. New York: Paulist Press.
- Schoenfeld, A. H. (1987). Cognitive science and mathematics education: An overview. In A. H. Schoenfeld (Ed.), *Cognitive science and mathematics education* (pp. 1–32). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Seigfried, C. H. (1990). *William James's radical reconstruction of philosophy*. Albany, NY: State University of New York Press.
- Sleeper, R. W. (1986). *The necessity of pragmatism. John Dewey's conception of philosophy*. New Haven, CT: Yale University Press.
- Stetsenko, A., & Arievidt, I. (1997). Constructing and deconstructing the self: Comparing post-Vygotskian and discourse-based versions of social constructivism. *Mind, Culture, and Activity: An International Journal*, 4(3), 159–172.
- Thayer, H. S. & Thayer, V. T. (1978). Introduction. In J. A. Boydston (Ed.), *John Dewey: The middle works, 1899–1924* (Vol. 6). Carbondale: Southern Illinois University Press.
- Valsiner, J., & van der Veer, R. (1988). On the social nature of human cognition. *Journal for the Theory of the Behavioral Sciences*, 18, 117–135.
- van der Veer, R., & Valsiner, J. (1991). *Understanding Vygotsky: A quest for synthesis*. Oxford, England: Blackwell.
- Vygotsky, L. (1991). Imagination and creativity in the adolescent. *Soviet Psychology*, 29(1), 73–88.
- Vygotsky, L. (1986). *Thought and language* (A. Kozulin, Trans.). Cambridge, MA: MIT Press.
- Vygotsky, L. (1997a). On psychological systems. In R. W. Rieber & J. Wollock (Eds.), *The collected works of L. S. Vygotsky: Vol. 3. Problems of the theory and history of psychology* (pp. 91–107). New York: Plenum. (Unpublished manuscript)
- Vygotsky, L. (1997b). The crisis in psychology. In R. W. Rieber & J. Wollock (Eds.), *The collected works of L. S. Vygotsky: Vol. 3. Problems of the theory and history of psychology* (pp. 233–343). New York: Plenum. (Unpublished manuscript)
- Vygotsky, L. (1997c). The preface to Buhler. In R. W. Rieber & J. Wollock (Eds.), *The collected works of L. S. Vygotsky: Vol. 3. Problems of the theory and history of psychology* (pp. 129–138). New York: Plenum. (Original work published 1930)
- Vygotsky, L. (1997d). The problem of consciousness. In R. W. Rieber & J. Wollock (Eds.), *The collected works of L. S. Vygotsky: Vol. 3. Problems of the theory and history of psychology* (pp. 129–138). New York: Plenum. (Unpublished notes)
- Wertsch, J. V., & Rupert, L. J. (1993). The authority of cultural tools in a sociocultural approach to mediated agency. *Cognition and Instruction*, 11(3 & 4), 227–239.
- Yaroshevsky, M. G. (1996). Marxism in Soviet psychology: The social role of Russian science. In V. A. Koltsova, Y. N. Oleinik, A. R. Gilgen, & C. K. Gilgen (Eds.), *Post-Soviet perspectives on Russian psychology* (pp. 161–186). Westport, CT: Greenwood.
- Yaroshevsky, M. G., & Gurgenidze, G. S. (1997). Epilogue. In R. W. Rieber & J. Wollock (Eds.), *The collected works of L. S. Vygotsky: Vol. 3. Problems of the theory and history of psychology* (pp. 345–369). New York: Plenum.
- Zinchenko, V. P. (1996). Developing activity theory: The zone of proximal development and beyond. In B. A. Nardi (Ed.), *Context and consciousness. Activity theory and human-computer interaction* (pp. 283–324). Cambridge, MA: MIT Press.