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# Obstacles to Understanding Cognition As Situated

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Anderson, Reder, and Simon (1996) disputed four positions that they attribute to situated cognition theory:

- Action is grounded in the concrete situation in which it occurs;
- Knowledge does not transfer between tasks;
- Training by abstraction is of little use; and
- Instruction must be done in complex social environments. (p. 5)

Greeno (1997) argued that these are misreadings of situative positions, occasioned by paradigmatic differences in presupposition and language: "In discussions of the situative and cognitive perspectives, proponents of the two sides tend to talk and write past each other because they address different questions" (pp. 5–6). Greeno is optimistic that "by identifying the presuppositions of the different questions, we can clarify substantive differences between the perspectives and thereby understand better what theoretical and educational issues are at stake in the debate" (p. 6). But despite his notable effort to contrast the cognitive and situative presuppositions, Anderson, Reder, and Simon (1997) continue to see the problems as "more linguistic than substantive" (p. 19): "For the life of us, we fail to see the difference between these questions" (p. 19); "A rhetorical language game is being played" (p. 19); "If it were not for Greeno's labeling we would not have been able to guess which was the cognitive and which was the situated question" (p. 20). In this response, we explore the current state of situated cognition theory and point to underlying issues that remain to be clarified for the substantive differences between situative and cognitive approaches to be appreciated.

## Problematics of Situated Cognition Theory

Situated cognition theory is an ambitious and still-evolving project to understand learning in both its individual and social aspects. Social constructivists often address this same objective through complementary (or coordinated) analyses (e.g., Cobb, 1994). But situated cognition theorists seek an integration rather than a coordination of theories. As Lave (1988) explains, in the kind of dialectical theory that is needed, the "units of analysis, though traditionally elaborated separately [for social and individualist theories], must be defined together and consistently" (p. 146). This under-

taking involves a difficult synthesis of seemingly opposing perspectives.

The dialectical mission seems not to be appreciated by Anderson, Reder, and Simon (1997), who see situated cognition theory as radically environmentalist:

A radical behaviorist like Skinner would have objected to the cognitive version [of Greeno's question] because it contains the "mentalistic" construct "knowledge," a word to which Greeno seems to object throughout his essay. Indeed, it is curious how much the situated position sounds like Skinner's description of his behaviorist Utopia. (pp. 19–20)

Surveying the corpus of situated cognition research, one can appreciate the impression of the field that Anderson, Reder, and Simon have gleaned. Studies have tended to employ anthropological methods to investigate persons-acting within complex social and material contexts. Most of the theoretical discussions explore the structure of these contexts and the patterns of participation therein. For the most part, constructs relating to individual minds—like *concepts* and *mental representations* that constitute the usual foci of cognitive psychology—are avoided. To readers like Anderson, Reder, and Simon, talk of learning, thinking, and knowing as "relations among people engaged in activity in, with, and arising from the socially and culturally structured world" (Lave, 1991, p. 67) seems to be just that—talk.

Coincidentally (?), in the same issue of *Educational Researcher* containing the Greeno response and the rejoinder by Anderson et al., St. Julien (1997a) provides insight into the apparent one-sidedness of situated cognition theory:

It is striking that while objections to teaching techniques built on the [cognitivist] assumption of the stable, context-free object of knowledge associated with geometric rationality are legion, there have been very few educational critiques of representation itself. To some extent this may be because in alternative visions, representation as such

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plays a very small role in defining the nature of what is learned. In the early visions of the pragmatists Dewey, Mead, and James activity and perception play a much larger role; the same is true of situated cognition and associated Vygotskian perspectives today. Still, in both cases the role of internal representations—in-the-head representation—is little discussed, perhaps because of the behaviorist influence prevalent during pragmatism's heyday and because of the revolt against individualist psychology that characterizes current situated perspectives. (p. 38)

St. Julien's observations regarding the problem of representation suggest that situated cognitionists have not yet succeeded in meeting Lave's challenge, noted above, to propound a theory that fully realizes individual agency in its social makeup.

Elsewhere (Kirshner & Whitson, 1997), we have traced the difficulties with current accounts back to the supporting traditions that inform situated cognition theory. Theoretical formulations of situated cognition have tended to rely on two academic traditions: a critical anthropology (e.g., Lave, 1988, informed by Bourdieu's, 1977, 1984, social theory) and neo-Vygotskian sociocultural theory (e.g., Newman, Griffin, & Cole, 1989; Rogoff, 1990). Lave's critical anthropology incorporates a hierarchy of theoretical constructs to define a theory of activity that spans local *settings* to broader social and political *arenas*:

The supermarket [for example] as arena is the product of patterns of capital formation and political economy. It is not negotiable directly by the individual. It is outside of, yet encompasses the individual, providing a higher-order institutional framework within which setting is constituted. At the same time, for individual shoppers, the supermarket is a repeatedly experienced, personally ordered and edited version of the arena. In this aspect it may be termed a "setting" for activity. (Lave, 1988, p. 151)

In Lave's (1988) analysis, *structuring resources* function within settings to modulate the individual's resolution of the dilemmas that motivate their situated engagement. Structuring resources are aspects of the setting that may differentially impinge on the individual's activity, as when the rhythm of background music in the supermarket might influence the rate of progression through the aisles. Reciprocally (but unequally), the exigencies of shopping (e.g., stopping to compare similar products) may impinge on the linked activity of music appreciation. Thus structuring resources constitute linkages across diverse domains and create the possibility of a dialectical synthesis of persons-acting and their settings: "In practice, such [structuring] resources are to be found not only in the memory of the person-acting but in activity, in relation with the setting, taking shape at the intersection of multiple realities, produced in conflict and creating value" (pp. 97-98).

Sociocultural theory concerns itself with the processes whereby cultures reproduce themselves across generational boundaries. In this view, learning transpires within a *zone of proximal development*, conceived as the distance between a child's "actual developmental level as determined by independent problem solving [and the higher level of] potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). Interpsychological knowledge in this social plane is then internalized or *appropriated*

(Leont'ev, 1981) as intrapsychological knowledge of the student (Newman, Griffin, & Cole, 1989).

Appropriation is an important alternative to the intrapsychological notion of internalization in cognitive science (where something external is copied into the novice's sphere). Rather, it is an aspect of interpsychological relations in which tools (linguistic or material) in the social environment are used by the novice adaptively in experimental imitation of the larger culture's usage. Paradoxically, it is the misconstrual by a responsive social milieu of the novice's intent and capabilities that provides a crucial opportunity for the novice to reconfigure his or her self-understanding and ultimately his or her competence.

Both of these approaches face deep and subtle problems in forging a true dialectical synthesis of social and individual cognition. Lave's (1988) critical approach incorporating fields and settings draws from Bourdieu's extensive efforts (e.g., 1977, 1984) to rethink the subject-object dichotomies of classical and current social theory. But as Collins (1993) points out, Bourdieu's leaning is toward a social determinism that undervalues the emergent possibilities of personal intersubjective relations:

Bourdieu's formulation emphasizes and provides insight into the *pregivenness* of verbal situation, into the already-situatedness of situated encounters. We may still wonder, however, about an *immediate*, determinate relation between social structure and (verbal) interaction. . . . For Bourdieu, however, the actions between agents, or personal intersubjective relations, are not the social. The social is fundamentally defined by fields of relations. . . . As part of his critique of subjectivism, he rejects any attempt to "reduce social space to the conjunctural space of interactions" and argues that it is necessary to construct an objective social space, "a structure of objective relations which determines the possible form of interactions" (1984: 244). (Collins, 1993, p. 123)

Collins (1993) attributes this social determinism to the mutual interdependence (and hence analytic intractability) of Bourdieu's central organizing principles of *capital* (accumulable social-symbolic resources), *field* (the arenas of social life and struggle), and *habitus* (embodied social structures). He concludes that in Bourdieu's dialectic "the discursive always seems deducible from, reducible to, in a word, determined by, something else: class conditions, capital composition, habitus, field effects. There is a truth in this determinist argument, but it is one-sided" (Collins, 1993, p. 134).

Lave's notion of structuring resources is an important attempt to escape the tendencies toward social determinism detected in Bourdieu's work. As we see the problem, however, the explanatory value of structuring resources is limited by the vague and ambiguous sense of the "multiple realities" (see above quotation) that they may bridge. As illustrated in her examples, these realities tend to be materially defined, leading to a too tenuous account of subjectivity where precisely a strong account is needed to counter the determinism of the social. Walkerdine (1997) has articulated similar concerns:

For Lave, practices were activities and people acting in a setting, specified by a dialectical relationship. I do not think that this is at all clear and carries the danger that neither the person nor the setting is theorized. Thus, we are left rather too close to traditional individual-society dualism than I presume that Lave would like. (p. 63)

The Vygotskian tradition is similarly weighted toward a deterministic social plane. The source of this weighting is the central tenet that

Any function in the child's cultural development appears twice, or on two planes. First it appears on the social plane, and then on the psychological plane. First it appears between people as an interpsychological category, and then within the child as an intrapsychological category. . . . Social relations or relations among people genetically underlie all higher [mental] functions and their relationships. (Vygotsky, 1981, p. 163)

Of course, the determinism of the social plane is not a simplistic copying of structures to the psychological plane. According to Wertsch (1985), "Vygotsky argued that there is an inherent relationship between external and internal activity, but it is a *genetic* relationship in which the major issue is how internal mental processes are *created* as a result of the child's exposure to what Vygotsky called 'mature cultural forms of behavior'" (p. 63).

One way to frame the problem of social determinism is regarding the explanatory potential of sociocultural theory for the *production*—and not just the *reproduction*—of culture. A contemporary version of this problem involves the metaphor of the *transmission of culture* as realized through classroom engagements in which "the teacher is . . . typically expected to insert culturally approved insights that students can co-opt, and to appropriate students' actions into the wider system of . . . practices that they are to reconstruct" (Cobb & Yackel, 1996, p. 186). In Cobb and Yackel's view, the metaphor of cultural transmission positions the researcher outside of the cultural life of the subjects, rendering learning and development from a distance (a position that they see as useful for some purposes). But situated cognition theory cannot afford such distance if it is to account for subjects as fully socially and individually constituted.

### Transfer of Training

To relate these general concerns to the debate between Anderson et al. (1996, 1997) and Greeno (1997), we will focus on the issue of *transfer of training* as these authors have engaged with it. As situativity theorists ourselves, we concur with Greeno's (1997) criticisms of the traditional cognitive paradigm wherein "knowledge must be like a substance that is acquired during learning and later moved to a new situation where it either is or is not used" (p. 12). Instead, situated cognition theory requires us to recognize that "all knowledge is . . . like language. Its constituent parts index the world and so are inextricably a product of the activity and situations in which they are produced" (Brown, Collins, & Duguid, 1989, p. 33).

Given that the enmeshment of knowledge with the situation is the hallmark of situated cognition theory, it is noteworthy that Greeno (1997) (based on Greeno, Moore, & Smith, 1993) contests the conclusion of Anderson et al. (1996) that in the situative viewpoint, "knowledge does not transfer between tasks" (p. 6). But Greeno's account, we believe, is incomplete and only partly salutary to the dilemmas of situated theorizing.

To counter the cognitive position that "transfer between tasks is a function of the degree to which the tasks share cognitive elements" (Anderson et al., 1996, p. 7), Greeno (1997) offers that "the situative perspective . . . focuses on

consistency or inconsistency of patterns of participatory processes across situations" (p. 12). Greeno et al. (1993) elaborate: "Transfer of a learned activity to a different situation involves . . . *invariant interaction* of the agent within the situation" (p. 102, italics added).

Are Greeno's interactional invariants in participation really an advance over the "share[d] cognitive elements" of cognitive theory? We think they are, but a limited one, with contradictory implications. First, they may signal a retreat from the fully situative position quoted from Brown et al. (1989) above: Knowledge now is tied to activities, but not to (particular) situations (rather to a "range of situations" or to "situation types") (Greeno et al., 1993, pp. 102, 105).

Second (despite the useful refocusing onto participatory processes within situations), they leave essentially untested the common sense view of situations as discrete locations in physical-temporal space that we see as a central problem for situated cognition theory.

We observe the difficulties that ensue from this construal of situations in the eloquent invocation of Anderson et al. (1997):

Anyone who has explored the structure of a beautiful flower or of a coral reef knows that learning about something can have a joy quite independent of any social structure, instruction, interpersonal interaction, or group participation. (p. 20)

Solitary exploration of a flower or coral reef was offered as counter-example to expose as "either false or vacuous" Greeno's suggestion that "all learning involves socially organized activity" (Anderson et al., 1997, p. 20). But Greeno (1997) himself had immediately illustrated his proposition that "all instruction occurs in complex social environments" (p. 10) with examples of individuals learning without others being physically present with them in time and space:

For example, a student studying alone with a textbook or a computer tutor may not have other people in the same room at the time, but the student's activity is certainly shaped by the social arrangements that produced the textbook or the computer program, led to the student's being enrolled in the class where the text or program was assigned, and provided the setting in which the student's learning will make a difference in how the student participates in some social activity, such as a class discussion or a test. (Greeno, 1997, pp. 9–10)

Although careful phenomenological investigation would challenge the presumed independence of an individual's solitary contemplation of a flower or coral reef, the issue does seem to concern this possibility—the possibility of truly *independent* learning by the individual, rather than the possibility of learning outside of time-and-space "situations" in which the learner actively participates in some sort of "socially organized activity" with other people. But if the claim that "all learning is social" means only that learning "involve[s] participants who are in a general social context" then Anderson et al. (1997) construe this as nothing more than the "vacuous" claim that "we humans are social animals" (p. 20).

Although Greeno has taken pains to explicitly deny understanding of the complex social situations in which cognition occurs as being necessarily a physical location in time and space where people are together physically as participants in cognitive activity, critics such as Anderson et al. re-

main at a loss as to how the social situativity of cognition is to be construed as meaningful in any other sense. Greeno's analytical focus on diverse "contexts" as offering variable "affordances" for an agent's performance of learned abilities (Greeno, 1997, p. 12; Greeno et al., 1993, p. 102) does not provide his critics with anything that they can understand as a viable alternative to their own ways of accounting for transfer between tasks (except for what they see as the more "behaviorist" orientation of situativity theory) (Anderson et al., 1997, p. 19).

Common to both "cognitive" and "situative" discourses is the implicit presupposition of "situation" as essentially a matter of physical time and space. What we need, rather, are ways to theorize about cognition and community that transcend such physiotemporal domination. We note that both the anthropological and sociocultural traditions that inform situated cognition theorizing are predisposed to take this same commonsense notion of situation as fundamental to inquiry: the anthropological tradition rooted in the study of intact indigenous groups interacting in bounded spatial/temporal location; sociocultural theory focused on the zone of proximal development, again informed by intersubjective accommodations within a fixed "spatiotemporal context" (Wertsch, 1984, p. 9).

In his observation that "'generality of knowing' is a more accurate phrase than 'transfer of knowledge'" (p. 11), there is some evidence that Greeno (1997) resists the very notion of transfer between discrete situations as an analytic problem. But ultimately his situative framing of the transfer question cannot avoid having to segment experience into situations in the usual way: "When someone has become more successful at participating in an activity in one kind of situation, are there other kinds of situations in which that person will also be more adept?" (p. 11). Perhaps it is understandable how Anderson et al. (1997) "fail to see a real difference between the two versions of the question [situative and cognitive]" (p. 19).

### Rethinking the Foundations of Situated Cognition Theory

In our previous work, we have called for a "reconceptualization [of situated cognition theory] so fundamental as to demand a repositioning within the broader supporting disciplines" (Kirshner & Whitson, 1997, p. 3), a reconceptualization that "probes the physiological, psychoanalytic, and semiotic constitution of persons" (p. 9). In this section, we outline how such a reconceptualization can help mediate notions of situation, mental representation, agency, and transfer.

St. Julien (1997a, 1997b) contributes to this reformulation by attending to the material substrate of cognition—the brain. Connectionist architectures reveal cognition, not as a serial process as would support notions of sequential transformation of mental representations, but as massively parallel patterns of neural firings. What is most promising for situated cognition theory about connectionist architectures and related neurological research is the remarkable responsiveness of the cognitive system to external stimuli, suggesting a much closer and more direct linkage between in-the-head processes and involvements in the world. Connectionist models perform well at the kinds of tasks that humans do best, like recognizing faces from different angles, and have the most difficulty with sequential, rule-

based tasks that only computers do well. Thus, connectionist psychology invites us to rethink cognition as building on students' ongoing activity and participation.

While a physiological perspective provides a necessary foundation for situated cognition theory, the social constitution of persons must be addressed in its own terms. We are informed here by Walkerdine's (1988, 1990, 1997) blend of Foucauldian social theory and Lacanian psychoanalysis, which locates the individual subject at the interstices of diverse subjectivities. For Foucault (1977, 1979), subjectivities are historically constituted fictions produced in "regimes of truth" functioning in institutional and bureaucratic settings (Walkerdine, 1997). Thus, Walkerdine (1990) is concerned with how "the woman," "the child," and "the mathematically talented student" are produced as signs within the inscribed discursive practices of schools. But Walkerdine goes beyond Foucault to examine how subjects develop through their enmeshment in conflicting subjectivities. Here she draws on Lacan's reformulation of de Saussure's semiotics to pursue the reciprocal development of cognition and agency as emerging in struggles over subject positions drawn from competing social discourses. In this way, situations are theorized as interpenetrated by the conflicting subjectivities that subjects bring to them.

In de Saussure's (1974) semiotics, a language organizes the set of possible meanings (signifieds) as a field of differences, structurally described. But Walkerdine's sign (following Lacan, 1977) is a socially produced result:

For her [Walkerdine], a signified was not an abstract meaning but rather a form of activity, and specifically a form of joint or shared activity among a number of people. To produce the child as a sign, then, is to orchestrate a form of joint activity that can be recognized as exhibiting the signified that goes together with a particular signifier, namely "the child." (Agre, 1997, p. 75)

The semiotic device most often used in her analyses is Lacan's *chaining of signifiers*, in which a signifier within one sign combination becomes the signified in a subsequent sign combination. This chaining process serves to free the sign from the domination of situations literally or materially conceived. For instance, Walkerdine (1988) traces the movement of signifiers away from metaphoric content toward metonymic form in her account of the development of abstract reasoning. As well, this chaining process disrupts dualist interpretations of de Saussure's theory in which a signifier (e.g., the phonetic string /c/a/t/) might be associated with a mental representation and the signified (e.g., the concept of the feline animal) with an object in the world. In this respect, chaining of signifiers offers a nondualist alternative to in-the-head accounts of thinking, in which the signifier in one sign combination becomes the signified in the next. (See Cobb, Gravemeijer, Yackel, McClain, & Whitenack, 1997, for an application of this notion of semiotic thought to analyzing cognitive activity in a first-grade mathematics class.) For Walkerdine (1988, 1990), this semiotic chaining pertains to the psychoanalytic process of fantasizing, which she implicates in the development of subjects and in the regulation of social practices.

Although Lacan's semiotic theory provides many useful elements for reconceiving situated cognition, Whitson (1997) finds that applications of the theory inevitably are unconstrained and ad hoc. Lacan's theory describes how

signs can be linked, but does not account for which signs happen to become connected within particular life histories. Walkerdine circumvents this limitation by complementing Lacanian semiotics (which enables her to see a chaining of physical and verbal or conceptual signifiers in a process that is dynamic and productive and not merely representational) with social theory (which enables her to situate the Lacanian "free play of signifiers" within social, economic, and political contexts, which can be seen as imposing the constraints and influences that help determine, from the social side, which of the potential chainings of signifiers will be actualized in the formation of individual subjects within the social world). Desire, energized by somatic forces, also acts to constrain and influence sign activity from the side of individuals as physically embodied human beings through processes that might be accounted for by invoking psychoanalytic or other psychological theories. Thus, the freedom and indeterminacy of Lacanian semiotics is complemented by social/economic/political and psychological theory that can account for both social and individual/somatic constraints in determining the realization of actual events and practices.

Walkerdine's approach does upset the dichotomy between individual self and social situation. Instead of "cognition" in the heads of individuals, we now have sign activity that occurs in a social space where the essentially free chaining of physical and verbal or conceptual signifiers is subjected to constraints and determination by potentially conflicting social and somatic influences. In this approach, however, the Cartesian dualism is merely transposed: The dualism between "mind" and "world" becomes a dualism between the free realm of sign activity and the more deterministic realm of social and somatic processes.

We believe that the Cartesian dualism of our intellectual tradition, which stubbornly persists even in Walkerdine's approach, poses unnecessary obstacles to progress in dealing with the issues that have emerged in this dialogue between cognitive and situative theorists. A more successful approach, dispensing altogether with Cartesian dualism, can be articulated on the basis of the semiotic theory founded by C. S. Peirce (the American philosopher who had a great influence on Dewey, among others).

Peirce's semiotic theory is most obviously distinguished from de Saussure's by his recognition of the irreducibly *triadic* sign relations that incorporate the effect of the sign within the constitution of the sign itself. For instance, a *representamen* such as the phonetic string /c/a/t/ cannot be said to represent the feline animal except insofar as it causes some agent to respond (e.g., by smiling, grimacing, imagining, etc.). This response (or *interpretant*—e.g., the smile) itself may come to serve as a representamen in yet another sign combination—for instance, by eliciting a flirtatious remark from a nearby stranger for whom the smile was an indicator of friendliness. Thus, Peircean sign activity shares with Lacan's chaining the dynamic quality of thought. But unlike the unconstrained chaining of Lacan's signifiers, Peirce's signs incorporate within their constitution the possibilities for their own trajectories. As well, the range of semiotic connectivity enabled by Peirce's conception of the sign is much broader than the restrictive linearity imposed by Lacan's formulation.

The three terms acting together in a triadic sign relation might include elements of the most diverse kinds, includ-

ing abstract verbally articulated concepts as well as habits, regimens, ideologies, emotions, and physiological states and ranging from genetically programmed motor reflexes to consciously motivated verbal reactions. The kinds of intracranial, neurological phenomena described in the discussions of connectionism by Bereiter (1991), Gee (1992), and St. Julien (1997b) can be seen as elements that can participate triadically with other elements as diverse as social norms and public laws or policies within the fundamental nuclei of sign activity. Peircean semiotic theory is able to investigate the complex variety of ways that it is possible for different kinds of elements to function together semiosically in the complex, dynamic, and continuously productive activity of triadic signs.

In one example elaborated by Whitson (1997), Peircean analysis of triadic sign activity was used to analyze a case of effective but inappropriate transfer of learning across situations. Some students in an underclass-level college course were found to have radically misunderstood "motivation" in a chapter on motivation research in their consumer behavior text. The term was used in that textbook chapter in the sense of "motivation" as studied by researchers in behavioral psychology, including laboratory research using mice and other animals. Some students in the class were found to have construed "motivation" in terms of completely different structures of semantic relationships involving morally charged explanations of personal success or failure in terms of persons being "highly motivated," "not motivated," "lazy," or "undisciplined." Peircean analysis was used to show how such divergent readings of a textbook chapter in the classroom situation could be embedded in the students' practices of personal self-management, for which they made use of coffee and alarm clocks and interpreted their physiologically distressed states of sleep deprivation as positive and even somewhat pleasurable signs of motivation and self-discipline.

Lacan's model of a "free play of signifiers" would also allow a wide variety of elements to participate together within the free "chaining" of dyadic signifier-signifieds. By contrast with the Peircean account of semiosis, we can now see how the indeterminacy, or "freedom," in Lacan's approach betrays a basic flaw inherent in the two-term model of the sign, which he adopted from de Saussure. Speaking only of the relation between a mental concept (signified) and an "acoustic image" (signifier), de Saussure described the relationship between those terms as essentially "arbitrary" or "unmotivated." The arbitrary nature of the dyads is extended in Lacan's process of "chaining," which can be constrained, as we have seen, only by forces impinging on this process from outside of the sign activity conceived of as a "free play" of dyadic signifier-signifieds.

By contrast, Peirce's approach enables us to see how the signs representing "motivation" in the textbook chapter gave rise to misreadings by some students, as the sign activity of interpretation by these students was divergently motivated by their practices of self-discipline for personal success. These motivating preoccupations, projects, and practices, in turn, could be seen as embedded in diverse social, moral, religious, and political projects, practices, and ideologies. Using the Peircean approach, we do not leave semiotics behind as we investigate the contextual processes—which are still semiotic processes—that participate in determining which of the potential sign relations come to

be realized within classroom learning. Moreover, the Peircean approach insists on observing the multiplicity of potentially conflicting motivations for semiosis and the essential *corrigibility* of sign activity in developing more successful or satisfactory interpretations.

In our example, the students' motivation to understand the intended meaning of the textbook chapter could operate triadically: Their interpretation was not just a dyadic "signifier" of the text (as its dyadically complementary "signified"). In Peircean terms, their initial interpretation was, rather, a triadic "interpretant," motivated in response to the text ("representamen"), not for itself, but *as standing for* its intended meaning (i.e., the "object" of mediating representation by the text), so that students may not only learn to reinterpret this particular text with greater comprehension of its intended meaning, but also to develop more successful practices for reading a variety of texts, including texts from discourses (such as the discourse of their behavioral psychology textbook, in this case) that may be different from the familiar discourses of their daily lives.

Returning to the conflicted problematic of how competencies can span diverse situations (the problem of transfer), our suggestions point to a blurring of the boundaries between the individual and the situation (as reified in cognitive science) as well as to a blurring of the boundaries between otherwise distinct communities of practice (as reified in current situated cognition research). The problem of transfer, so intractable in these approaches, is transformed into the problem of understanding how apparently discrete communities of practice are complexly interlinked and how particular individuals, through multiple positionings in multiple discourses, do or do not participate in those linkages.

### Educational Horizons

As Donmoyer (1997) pointed out in his editorial introduction, Greeno (1997) and Anderson, Reder, and Simon (1997) make an important discursive transition in adopting the utilitarian standard of relevance for education as a determinant of the adequacy of situative and cognitive perspectives. Unfortunately, we do not share Greeno's (1997) assessment of current situative perspectives as adequately "provid[ing] a broader framework for understanding and improving educational practice" (p. 15). True, situated cognition theories have highlighted the importance of the context of learning in what is learned. But with the crucial epistemological presuppositions remaining buried beneath the words, the influence of this observation is likely to remain limited in an educational environment dominated by dualist assumptions (witness the response by Anderson, Reder, & Simon, 1997).

In its more specific implications for education, situated cognition theory has yet to refine a distinct and distinctive approach. Citing situated cognition theory, some authors call for literal apprenticeship (Bailey, 1993; Hamilton, 1993; Kvale, 1995). Others advocate market-driven "micro-vouchers" as a way to eliminate public education (Perelman, 1992). More promising approaches like cognitive apprenticeship (Collins, Brown, & Newman, 1989) compete against these alternatives, but with no greater claim to legitimacy, intermixing cognitive and situative assumptions:

We propose that cognitive apprenticeship should extend situated learning to diverse settings so that students learn how to apply their skills in varied contexts. Moreover, *the*

*abstract principles underlying the application of knowledge and skills in different settings should be articulated as fully as possible by the teacher, whenever they arise in different contexts.* (p. 459, italics added)

We believe that as situated cognition theorists continue to excavate their motivating epistemological assumptions and to fashion a truly dialectical alternative to either social or individual cognitive theory, the possibility of becoming a transformative influence on educational practice will emerge. There is a power in, for example, Walkerdine's (1988) analysis of the development of mathematical mastery in children that, while still descriptive, can offer important insights to the teacher working with particular content. Broader educational heuristics already are emerging, for instance, from St. Julien's (1997b) observations (backed up by experimental results) of the need for category distinctions to arise from perceptual experience before the usual conceptual mediation of analytical discourses. Such prospects and possibilities make the conversation worth pursuing, with vigor.

### References

- Agre, P. E. (1997). Living math: Lave and Walkerdine on the meaning of everyday arithmetic. In D. Kirshner & J. Whitson (Eds.), *Situated cognition: Social, semiotic, and psychological perspectives* (pp. 71-82). Mahwah, NJ: Lawrence Erlbaum Associates.
- Anderson, J. R., Reder, L. M., & Simon, H. A. (1996). Situated learning and education. *Educational Researcher*, 25(4), 5-11.
- Anderson, J. R., Reder, L. M., & Simon, H. A. (1997). Situative versus cognitive perspectives: Form versus substance. *Educational Researcher*, 26(1), 18-21.
- Bailey, T. (1993). Can youth apprenticeship thrive in the United States? *Educational Researcher*, 22(3), 4-10.
- Bereiter, C. (1991). Implications of connectionism for thinking about rules. *Educational Researcher*, 20(3), 10-16.
- Bourdieu, P. (1977). *Outline of a theory of practice*. Cambridge, UK: Cambridge University Press.
- Bourdieu, P. (1984). *Distinction: A social critique of the judgment of taste*. Cambridge, MA: Harvard University Press.
- Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, 18(1), 32-42.
- Cobb, P. (1994). Where is the mind? Constructivist and sociocultural perspectives on mathematical development. *Educational Researcher*, 23(7), 13-20.
- Cobb, P., Gravemeijer, K., Yackel, E., McClain, K., & Whitenack, J. (1997). Mathematizing and symbolizing: The emergence of chains of signification in one first-grade classroom. In D. Kirshner & J. Whitson (Eds.), *Situated cognition: Social, semiotic, and psychological perspectives* (pp. 151-234). Mahwah, NJ: Lawrence Erlbaum Associates.
- Cobb, P., & Yackel, E. (1996). Constructivist, emergent, and sociocultural perspectives in the context of developmental research. *Educational Psychologist*, 31(3-4), 175-190.
- Collins, A., Brown, J. S., & Newman, S. (1989). Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics. In L. B. Resnick (Ed.), *Knowing, learning, and instruction* (pp. 453-493). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Collins, J. (1993). Determination and contradiction: An appreciation of and critique of the work of Pierre Bourdieu on language and education. In C. Calhoun, E. LiPuma, & M. Postone (Eds.), *Bourdieu: Critical perspectives* (pp. 116-138). Chicago: University of Chicago Press.
- Donmoyer, R. (1997). This issue: Refocusing on learning . . . and on how a research community might learn in an era of paradigm proliferation. *Educational Researcher*, 26(1), 4, 34.
- Foucault, M. (1977). *Discipline and punish: The birth of the prison* (A. Sheridan, Trans.). New York: Pantheon.
- Foucault, M. (1979). On governmentality. *Ideology and Consciousness*, 6(1), 5-21.
- Gee, J. P. (1992). *The social mind: Language, ideology, and social practice*. Hadley, MA: Bergin and Garvey.

- Greeno, J. G. (1997). On claims that answer the wrong question. *Educational Researcher*, 26(1), 5-17.
- Greeno, J. G., Moore, J. L., & Smith, D. R. (1993). Transfer of situated learning. In D. K. Detterman & R. J. Sternberg (Eds.), *Transfer on trial: Intelligence, cognition, and instruction* (pp. 99-167). Norwood, NJ: Ablex Publishing Corporation.
- Hamilton, S. F. (1993). Prospects for an American-style youth apprenticeship system. *Educational Researcher*, 22(3), 11-16.
- Kirshner, D., & Whitson, J. (1997). Editors' introduction. In D. Kirshner & J. Whitson (Eds.), *Situated cognition: Social, semiotic, and psychological perspectives* (pp. 1-16). Mahwah, NJ: Lawrence Erlbaum Associates.
- Kvale, S. (1995, April). *An educational rehabilitation of apprenticeship learning?* Paper presented at the American Educational Research Association annual meeting, San Francisco.
- Lacan, J. (1977). *Ecrits: A selection* (A. Sheridan, Trans.). New York: Norton.
- Lave, J. (1988). *Cognition in practice*. Cambridge, MA: Cambridge University Press.
- Lave, J. (1991). Situated learning in communities of practice. In L. B. Resnick, J. M. Levine, & S. D. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 63-82). Washington, DC: American Psychological Association.
- Leont'ev, A. N. (1981). *Problems in the development of mind*. Moscow, USSR: Progress Publishers.
- Newman, D., Griffin, P., & Cole, M. (1989). *The construction zone*. Cambridge, UK: Cambridge University Press.
- Perelman, L. J. (1992). *School's out: Hyperlearning, the new technology, and the end of education*. New York: Avon.
- Rogoff, B. (1990). *Apprenticeship in thinking*. New York: Oxford University Press.
- St. Julien, J. (1997a). Three books and one story: Making connections to learning. *Educational Researcher*, 26(1), 37-40.
- St. Julien, J. (1997b). Explaining learning: The research trajectory of situated cognition and the implications of connectionism. In D. Kirshner & J. Whitson (Eds.), *Situated cognition: Social, semiotic, and psychological perspectives* (pp. 261-280). Mahwah, NJ: Lawrence Erlbaum Associates.
- de Saussure, F. (1974). *Course in general linguistics* (C. Bally & A. Sechehaye, Eds.; W. Baskin, Trans.; Rev. ed.). London: Fontana.
- Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Vygotsky, L. S. (1981). The genesis of higher mental functions. In J. V. Wertsch (Ed.), *The concept of activity in Soviet psychology* (pp. 144-188). Armonk, NY: M. E. Sharpe.
- Walkerdine, V. (1988). *The mastery of reason: Cognitive development and the production of rationality*. London: Routledge.
- Walkerdine, V. (1990). *Schoolgirl fictions*. London: Verso.
- Walkerdine, V. (1997). Redefining the subject in situated cognition theory. In D. Kirshner & J. Whitson (Eds.), *Situated cognition: Social, semiotic, and psychological perspectives* (pp. 57-70). Mahwah, NJ: Lawrence Erlbaum Associates.
- Wertsch, J. V. (1984). The zone of proximal development: Some conceptual issues. In B. Rogoff & J. V. Wertsch (Eds.), *Children's learning in the "zone of proximal development"* (pp. 7-18). San Francisco: Jossey-Bass.
- Wertsch, J. V. (1985). *Vygotsky and the social formation of the mind*. Cambridge, MA: Harvard University Press.
- Whitson, J. (1997). Cognition as a semiotic process: Grounding, mediation, and critical reflective transcendence. In D. Kirshner & J. Whitson (Eds.), 8. (pp. 97-150). Mahwah, NJ: Lawrence Erlbaum Associates.

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