The Cambridge Companion to
VYGOTSKY

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7 Mediation

Mediation is a theme that runs throughout the writings of Lev Semënovich Vygotsky. In his view, a hallmark of human consciousness is that it is associated with the use of tools, especially "psychological tools" or "signs." Instead of acting in a direct, unmediated way in the social and physical world, our contact with the world is indirect or mediated by signs. This means that understanding the emergence and the definition of higher mental processes must be grounded in the notion of mediation.

Mediation also provides the foundation for another of Vygotsky's theoretical goals, namely, building a link between social and historical processes, on the one hand, and individuals' mental processes, on the other. It is because humans internalize forms of mediation provided by particular cultural, historical, and institutional forces that their mental functioning sociohistorically situated.

The importance that Vygotsky attached to mediation is reflected in a lecture he delivered near the end of his life, where he asserted, "A central fact of our psychology is the fact of mediation [oposredovanie]" (Vygotsky, 1982, p. 166). But this is an issue that concerned him from the beginning of his career onward. In a 1930 report on "The Instrumental Method in Psychology," for example, he focused on the importance of signs as "artificial formations... [that] are social, not organic or individual" (Vygotsky, 1981, p. 137) and he included under this heading: "language; various systems for counting; mnemonic techniques; algebraic symbol systems; works of art; writing; schemes, diagrams, maps, and mechanical drawings; all sorts of conventional signs" (Vygotsky, 1981, p. 137).

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In the analysis of the instrumental method that he provides in this article, Vygotsky outlined a mediational triangle for "artificial (instrumental) acts" (Vygotsky, 1981, p. 137). With regard to memory, for example, this meant that

> In natural memory, the direct (conditioned reflex) associative connection A-B is established between two stimuli A and B. In artificial, mnemotechnical memory of the same impression, instead of this direct connection A-B, two new connections, A-X and B-X, are established with the help of the psychological tool X (e.g., a knot in a handkerchief, a string on one's finger, a mnemonic scheme). (Vygotsky, 1981, p. 138)

It is no accident that this formulation bears striking similarities to the "basic mediational triangle" that Michael Cole (1996) places at the foundation of cultural psychology or to the elaborated set of triangles within triangles that Yrjö Engeström (1987) has employed in his writings. The ideas that Vygotsky developed have been elaborated in a variety of ways by other theorists to yield several productive lines of inquiry.

Vygotsky harnessed a developmental, or "genetic," method (Wertsch, 1985) when analyzing mediation, and for him this meant emphasizing qualitative transformation rather than quantitative increments. From this perspective, the inclusion of signs into human action does not simply lead to quantitative improvements in terms of speed or efficiency. Instead, the focus is on how the inclusion of tools and signs leads to qualitative transformation, a point Vygotsky made when he wrote, "By being included in the process of behavior, the psychological tool [i.e., sign] alters the entire flow and structure of mental functions. It does this by determining the structure of a new instrumental act just as a technical tool alters the process of a natural adaptation by determining the form of labor operations" (Vygotsky, 1981, p. 137).

In short, *mediation* is a central theme that runs throughout Vygotsky's thinking. However, this does not mean that he gave it a single, unified definition. Instead, mediation emerged in his texts in a variety of ways, and in the process, somewhat different meanings arose. I begin by presenting a basic opposition in the meanings that the term "mediation" took on in Vygotsky's writings. After outlining the two general types of mediation I see in his texts, I will return to some overarching themes that show how they can be understood as part of a larger picture.

VYGOTSKY'S TWO PERSPECTIVES ON MEDIATION

It is possible to find order in what otherwise might appear to be a varied, indeed contradictory, picture in Vygotsky's writings by distinguishing

between two basic types of mediation. This distinction has as much to do with the different disciplinary lenses through which Vygotsky approached mediation as it has to do with the actual differences in the forms it takes.

During the last decade of his career, Vygotsky was busy speaking to psychologists, teachers, and professionals concerned with children and adults with disabilities and difficulties, and, in doing so, he employed the professional language of the psychology and physiology of his day, a form of speaking that qualifies as what Bakhtin (1986) called a "social language." At the same time, however, Vygotsky continued to employ the theoretical framework and social language he had acquired in his early study of semiotics, poetics, and literary theory. These two social languages need not be viewed as entirely distinct or mutually unintelligible, but in many instances, they led Vygotsky to take somewhat different perspectives on a range of topics, including mediation.

When employing the first of these social languages, Vygotsky spoke in the idiom of psychology, especially about what we would today view as a form of behaviorism, or perhaps cognitivism, to come up with an account of what I will call "explicit mediation." The mediation involved is explicit in two senses. First, it is explicit in that an individual, or another person who is directing this individual, overtly and intentionally introduce a "stimulus means" into an ongoing stream of activity. Second, it is explicit in the sense that the materiality of the stimulus means, or signs involved, tends to be obvious and nontransitory.

Explicit mediation continues to be a topic of study in contemporary psychology and cognitive science. For example, in his analysis of "how a cockpit remembers its speeds," Edwin Hutchins (1995) examines human agents' uses of various "sociotechnical systems" to organize their memory and cognitive processes. As part of his argument, he makes an explicit call for cognitive science to go beyond its focus on isolated individuals and to take into account the role of cultural tools such as airplane gauges and instruments in remembering and human action in general.

Standing in contrast to explicit mediation is "implicit mediation," which tends to be less obvious and, therefore, more difficult to detect. For examples of *implicit mediation*, consider Vygotsky's discussions of the role of social and inner speech in mediating human consciousness. Because of the ephemeral and fleeting nature of these forms of mediation, they are often "transparent" to the unwary observer and are, therefore, less easily taken as objects of conscious reflection or manipulation. Furthermore, implicit mediation typically does not need to be artificially and intentionally introduced into ongoing action. Instead, it is part of an already ongoing communicative stream that is brought into contact

with other forms of action. Indeed, one of the properties that characterizes implicit mediation is that it involves signs, especially natural language, whose primary function is communication. In contrast to the case for explicit mediation, these signs are not purposefully introduced into human action, and they do not initially emerge for the purpose of organizing it. Instead, they are part of a preexisting, independent stream of communicative action that becomes integrated with other forms of goal-directed behavior.

EXPLICIT MEDIATION

Comments about what I am calling explicit mediation can be found at many points in Vygotsky's writing and in the work of his students and colleagues. For example, explicit mediation underpins his approach to concept development (e.g., Vygotsky, 1987, chapters 5 and 6), as well as the study of memory development in the "Forbidden Colors Task" used by Aleksei Nikolaevich Leont'ev in research he conducted in Vygotsky's Laboratory (cf. Leont'ev, 1932; Vygotsky, 1978, pp. 38–51).

Explicit mediation is usually at issue in discussions of the "functional method of dual stimulation," a notion that Vygotsky outlined in "An Experimental Study of Concept Development," in chapter 5 of *Thinking and Speech*. There he wrote:

> In using this method, we study the development and activity of the higher mental functions with the aid of two sets of stimuli. These two sets of stimuli fulfill different roles *vis-à-vis* the subject's behavior. One set of stimuli fulfills the function of the object on which the subject's activity is directed. The second functions as signs that facilitate the organization of this activity. (Vygotsky, 1987, p. 127)

In studies involving dual stimulation, Vygotsky's basic procedure was to encourage subjects to use a set of artificial stimuli, or signs that are overtly introduced into a subject's activity by an experimenter. For example, in the Forbidden Colors Task, subjects engaged in a task that required them to remember a list of color terms. They were given a set of colored cards and told that these cards could help them remember what color terms they had already mentioned and, according to the rules of the game, were not to mention again. In this case, the first set of stimuli, which "fulfill the function of the object on which the subject's activity is directed," was the set of color terms used by the subjects as they responded to the experimenter's questions. The second set of stimuli that were to function "as signs that facilitate the organization of this activity" were the colored cards introduced by the experimenter.

The basic aim of the Forbidden Colors Task study was to document how children use the signs provided by the experimenter (i.e., the colored cards) more effectively with age. Most 5- and 6-year-olds did not seem to realize that the signs had anything to do with their performance on the task, whereas 10- to 13-year-olds clearly did. The developmental path involved is one that moves from a point where the stimuli had very little meaning and functional efficacy to a point where subjects came to appreciate their significance for organizing their performance.

The following summary of the general point to be derived from this study frames this claim in terms of Vygotsky's genetic method, with its focus on qualitative transformation.

> We have found that sign operations appear as the result of a complex and prolonged process subject to all the basic laws of psychological evolution. *This means that sign-using activity in children is neither simply invented nor passed down from adults;* rather it arises from something that is originally not a sign operation and becomes one only after a series of *qualitative* transformations.
>
> (Vygotsky, 1978, pp. 45–46; emphasis in the original)

At this and other points where Vygotsky dealt with explicit mediation, he focused on how signs can be introduced to facilitate its organization. On the one hand, he presented his points in a social language of stimuli and responses, a language that would suggest there is little room for talk about the meaning or functional significance of signs. It would appear that one of his reasons for formulating things in this way was to join an ongoing intellectual discussion that employed this social language. On the other hand, his emphasis on the qualitative transformation of stimulus signs as they are employed at higher levels of development suggests that their meaning is undergoing change, a claim that lies outside the boundaries of this social language, which tends to eschew notions such as meaning or signification. In my view, the fact that Vygotsky introduced meaning into this discussion reflects his continuing concern with the poetic and semiotic issues that had been at the core of his studies since his earliest years, a concern that emerges more clearly in his writings that deal with the second general category of mediation.

IMPLICIT MEDIATION

Ideas about what I am calling implicit mediation emerge at numerous points in Vygotsky's writings, but perhaps the most elaborate rendition can be found in chapter 7 of *Thinking and Speech* (Vygotsky, 1987), a

text he completed near the end of his life. The title of this chapter is "Thought and Word" [Mysl' i Slovo].

The two terms in this chapter title represent poles of an opposition in Vygotsky's view. He formulated this opposition in order to highlight a conceptual problem he saw in much of the existing literature on thinking and speech. This was the "tendency to view thought and word as two independent and isolated elements" (Vygotsky, 1987, pp. 243–244). His account of verbal thinking – an account in which opposition, tension, and dialectic characterize the relationship between the two terms – was an attempt to overcome this tendency.

In his critique of the kind of false and misleading isolation of thought and word that he saw in the research of his day, Vygotsky proposed taking "word meaning" as a unit of analysis, something that allows us to recognize that it is "a phenomenon of both speech and intellect" (Vygotsky, 1987, p. 244). Throughout this chapter, Vygotsky emphasized the need to focus on the dialectic between thought and word. He viewed this dialectic as a sort of developmental struggle and asserted that this was "the primary result of this work [and]... the conceptual center of our investigation" (Vygotsky, 1987, p. 245). In his view, "The discovery that word meaning changes and develops is our new and fundamental contribution to the theory of thinking and speech" (Vygotsky, 1987, p. 245).

Vygotsky saw this claim about the developmental relationship between thought and word as applying to *microgenetic*, as well as *ontogenetic* processes, a point that is reflected in his assertion that word meaning "changes during the child's development and with different modes of functioning of thought" (Vygotsky, 1987, p. 249). Regardless of which "genetic domain" (Wertsch, 1985) is at issue, the general picture Vygotsky presented was one in which thought is posited to be an inchoate, "fused, unpartitioned whole" (Vygotsky, 1987, p. 251) that comes into contact with words, which involve generalization and discrete, sequential representation.

With regard to the latter realm of words, generalization, and discrete, sequential representation, Vygotsky posited "two planes of speech and argued that "the inner, meaningful, semantic aspect of speech is associated with different laws of movement than its external, auditory aspect" (Vygotsky, 1987, p. 250). This provided the foundation for an account of inner speech that was used by Luria (1975), Akhutina (1975), and others in their analyses of "dynamic aphasia." The general line of reasoning is one in which inner speech, with its peculiar properties such as *predicativity* (the tendency to drop "given" information or the "psychological subject") and *agglutination* (the tendency to combine surface forms into single units – see Wertsch [1985] on predicativity and agglutination) differs from the grammatical organization of external, auditory speech.

In this account, inner speech imposes the first round of segmentation and sequential organization on thought as it makes its way to overt expression.

In chapter 7 of *Thinking and Speech*, then, the story line is one in which two types of representation collide and mutually transform one another. One type – "thought" [mysl'] – is relatively inchoate, fused, unpartitioned, and nonsequential, and the other – "word" [slovo] introduces segmentation and sequence. For my purposes, what is important in all this is that the mediation involved is not explicit, that is, not the object of conscious reflection and not externally or intentionally introduced. Instead, mediation is something that is automatically and in most cases unintentionally built into mental functioning.

In developing his line of reasoning on this issue, Vygotsky was heavily indebted to one of his mentors, Gustav Gustavovich Shpet (1879–1937). In chapter 7 of *Thinking and Speech*, Vygotsky did not cite Shpet (although he did cite him in earlier work), but the reasons for this probably stemmed from political necessity. As Martsinkovskaya (1996), Nemeth (1997), and Zinchenko (2000) discuss, Shpet's problems with Soviet authorities, problems that would eventually lead to his brutal interrogation and execution in 1937, were already starting to emerge in the early 1930s. Recent accounts of Vygotsky's political acumen by Cole and Levitin (2006) make it clear that he would have been aware of what was, and was not permissible in the political atmosphere of the early 1930s in the USSR.

In any event, we know that Vygotsky was a student in Shpet's seminars for two years (Vygodskaya & Lifanova, 1996), and the themes that were discussed there undoubtedly included those outlined by Shpet in his writings, especially in his 1927 monograph, *The Inner Form of the Word: Studies and Variations on a Humboldtian Theme* (Shpet, 1999).

Building on the conceptual groundwork laid by Wilhelm von Humboldt, Shpet emphasized that,

> Language is not completed action, "ergon," but protracted activity, "energeia," that is, as Humboldt explained, "perpetually repeated work of the spirit, directed at making articulate sound the means for expressing thought." ... Synthesis in this case does not consist of tying together two abstracted units: pure thought and pure sound, but two members of a unified concrete structure, two terms of relationship: object oriented sense content ... and the external form of its verbal expression-embodiment ... in sensory perceptible forms. These forms are transformed through a relation to sense from natural forms combined in the "thing" to social signification specifically in the signs of cultural meaning.
>
> (Vygotsky, 1996, p. 94)

Shpet's insistence on language as activity is quite consistent with Vygotsky's focus on speech, as opposed to language. And Shpet's argument that the dialectic or synthesis involved is not between pure thought and pure sound is consistent with Vygotsky's critique of investigators who mistakenly viewed "thought and word as two independent and isolated elements." Instead of focusing on such elements as if they can be considered separately, Vygotsky, like Shpet, insisted on examining them as part of a unit of analysis that is inherently complex and dynamic. In Vygotsky's terms:

> This central idea ... can be expressed in the following general formula: The relationship of thought to word is not a thing but a process, a movement from thought to word and from word to thought. Psychological analysis indicates that this relationship is a developing process which changes as it passes through a series of stages ... The movement of thinking from thought to word is a developmental process.
>
> (Vygotsky, 1987, p. 250)

From this perspective the dialectic involved is between a material sign form – what Charles Sanders Peirce (1960) called a "sign vehicle" – and the object-oriented intentions of speakers or listeners. It always involves an element of collision and conflict between a sign vehicle, whose meaning tends to abstract and generalize and belongs to a preexisting semiotic community, on the one hand, and the unique, spatiotemporally located intention of the individual, on the other.

These points can be used to help summarize some of the differences between implicit and explicit mediation. Explicit mediation involves the intentional introduction of signs into an ongoing flow of activity. In this case, the signs tend to be designed and introduced by an external agent, such as a tutor, who can help reorganize an activity in some way. In contrast, implicit mediation typically involves signs in the form of natural language that have evolved in the service of communication and are then harnessed in other forms of activity. Because the integration of signs into thinking, remembering, and other forms of mental functioning occurs as part of the naturally occurring dialectic outlined by Shpet and Vygotsky, they do not readily become the object of consciousness or reflection.

SIGN MEANING DEVELOPS

The distinction I have drawn between explicit and implicit mediation in Vygotsky's writings might appear to take the form of a neat, even polar opposition, but this would be to oversimplify. The fact that these two

forms of mediation are part of a broader conceptual framework means that they share several common features, which can be appreciated by returning to Vygotsky's basic maxim that "sign meaning develops."

Throughout his writings Vygotsky emphasized the importance of using a developmental method to understand human mental functioning, and this applied to mediation in all its forms no less than any other topic. In this connection, he argued that a hallmark of the relationship between sign and behavior, as well as between word and thought, is that it undergoes fundamental change.

The general line of reasoning Vygotsky employed in this respect grew out of his critique of theorists who assumed that the relationship between word and thought remains constant. In contrast to this, he began with the assumption that signs first emerge in social and individual action without their users' full understanding of their meaning or functional role. What then follows is a process of coming to understand the meaning and functional significance of the sign forms that one has been using all along. In an important sense humans use signs before understanding what they are doing, or demonstrate "performance before competence," as Courtney Cazden (1981) succinctly and elegantly put it.

Vygotsky's line of reasoning on this issue rests on crucial assumptions about signs and their use in social and mental processes. In particular, it rests on ideas inherent in the semiotic triangle mentioned earlier, which distinguishes between sign form and sign meaning. In his account of phenomena ranging from the stimulus signs used in the Forbidden Colors Task to the regulative function of social, egocentric, and inner speech, Vygotsky assumed that a material sign form is involved and that this is crucial for understanding how its meaning can develop. The key to this is the insight that material sign forms make it possible to initiate communication and self-regulation, at least at primitive levels, even when the agents involved do not understand their full significance.

From this perspective, the general goal of instruction is to assist students in becoming fluent users of a sign system. The outcome is a new level, often a qualitatively new type, of "distributed cognition" (Salomon, 1993). Namely, it involves distribution between signs and the active agents employing them. In this approach, instruction amounts to a sort of "taming," or "domestication," of novices' actions in the world. This domestication has both benefits and costs because cultural tools inevitably bring with them "constraints" as well as "affordances" (Gibson, 1979; Wertsch, 1998). For example, learning how to deal with a set of data from empirical observations by employing a particular graphing technique provides insight into patterns that would otherwise remain undetected, but it also entails being less able to see other patterns that could be revealed by employing different means.

From a Vygotskian perspective, the process of mastering a semiotic tool typically begins on the social plane, though it of course has individual psychological moments and outcomes as well. In his "general genetic law of cultural development," Vygotsky made this point by arguing that higher mental functioning appears first on the "intermental" and then on the "intramental" plane. When encountering a new cultural tool, this means that the first stages of acquaintance typically involve social interaction and negotiation between experts and novices or among novices. It is precisely by means of participating in this social interaction that interpretations are first proposed and worked out and, therefore, become available to be taken over by individuals.

An interesting property of the sign systems that are at the heart of instruction is that they are incredibly robust in that they can allow interpretation and understanding at many different levels, and yet still support some form of the intermental functioning required to move learning and instruction along. It often seems to be possible to use these sign systems to communicate even with a very low level of shared understanding of their full implications. Indeed, most of us probably speak, calculate, and carry out other semiotic actions most of the time without understanding the full power of the sign systems we are employing. In the famous image provided by Edward Sapir (1921), it is as if we are harnessing a dynamo capable of generating a huge amount of electricity to power a simple doorbell.

This approach suggests that the act of speaking often (perhaps always) involves employing a sign system that forces us to say more (as well as perhaps less) than what we understand or intend. We say more in the sense that our interlocutors may understand us to be conveying a higher level message than our mastery of the sign system would warrant. This is so in everyday communication, even when we are speaking about topics on which we have developed real expertise, but it has particularly important implications when it comes to how novices participate in intermental functioning in instructional settings.

In order to see how all this works, it is useful to invoke a notion of "intersubjectivity" such as that proposed by Ragnar Rommetveit (1972, 1979) in connection with human communication in general and Barbara Rogoff (1980) in connection with human development and socialization in particular. Recently, Rommetveit has provided the following illustration of this phenomenon:

> Imagine the following situation: A lady who is a very knowledgeable amateur auto mechanic discovers that there is something wrong with the carburetor of her car. Her husband, who is notoriously ignorant about car engines and does not even know what a carburetor looks like, offers to drive the car to a garage to have it repaired. He tells the car

mechanic at the garage: "There is apparently something wrong with the carburetor." This saves the latter considerable time in searching for the problem.

For Rommetveit, the point is that the husband in this case may have attained only a very minimal level of intersubjectivity with the mechanic when it comes to understanding the idea and function – and even the referent – of "carburetor." However, he was still capable of passing along the message from his wife because he was harnessing a sign vehicle that did part of the work for him. As Rommetveit notes, instead of assuming that the husband possessed the understanding that could fully back up this utterance, he was involved in an episode of "ventriloquation" that allowed him to say more than he understood.

The point of Rommetveit's example is not to encourage us to go about using expressions for which we have only a minimal understanding. Indeed, his example is clever precisely to the degree that it manages to do something unusual in this regard. In socialization, learning, and instruction, though, the point of many exercises may be to put us in a position not unlike that of the husband in this illustration. The standard situation in many instructional settings involves students' saying and doing things that they only partially understand. This raises what might appear to some to be a paradox of how it is possible to say more than one understands, but it makes sense if one recognizes that the material form of sign vehicles allows us to function at a level that is "out ahead" of our current mastery.

But the point for instruction goes beyond this. Not only may it be possible, but it may be *desirable* for students to say and do things that seem to extend beyond their level of understanding. This is because such a possibility means they can enter into a basic form of intersubjectivity with more experienced teachers and experts and thereby leverage their way up through increasing levels of expertise. What might at first appear to be a failure to communicate is often the key to entering into a new area of instruction.

To illustrate how these ideas are instantiated in an instructional setting, I turn to a recent analysis by Wertsch and Kazak (in press). This has to do with a teacher speaking to a group of students about organizing and presenting data from observations they had made about what conditions foster the most growth in plants. Specifically, they had grown plants under various conditions of light. By discussing the date the students had collected in this exercise, this teacher introduced both explicit mediation and implicit forms of mediation. The explicit mediational means he introduced was a piece of graph paper that the students were

to use for presenting their data. The implicit mediation in this case arose in connection with his use of a few basic terms. In addition to telling the students "to organize the data in some way," he asks the students to "try to determine what's the typical fast plant," using the term "typical" on several occasions, and he tells them that they should asking "how spread out" the data are.

For anyone familiar with statistical analysis, terms such as "typical" and "spread out" are tied to a standard set of procedures and measures. Namely, the typicality about which the instructor was inquiring has to do with central tendency, and a concern with how spread out the data are reflects an interest in what is called variation in the language of statistics. This instructor did not employ technical terms like "central tendency" or "variation" into the discussion, but he was introducing expressions intended to get students to start thinking about these issues. Furthermore, he provided them with graph paper, which would "help them" in some way, such as plotting the data in the form of a histogram. From the perspective of analyzing mediation, then, he was introducing three material sign vehicles into the *intermental* and *intramental* functioning that had only minimal meaning or functional significance for the students.

In the discussion that followed, it became quite clear that, at least initially, the students' understanding of how to use graph paper to organize the data, as well as their understanding of the terms "typical" and "spread out" had little overlap with that of the instructor. The group first proposed to put one number from their data set in each square on the paper. This seems to have been their initial attempt to respond to the directive to "organize the data." To be sure, they were using the material sign vehicle (i.e., the graph paper) provided to them, but they clearly did not know how to use it as an expert would. In contrast to expert performance, they were using this tool at a very low level of sophistication, one that indeed might simply be termed inappropriate. In this sense, their use (misuse?) of the cultural tool bears a striking resemblance with young children's use of cards as memory cues in Leont'ev's "forbidden colors task" (Vygotsky, 1978).

Well into this instructional session, the instructor clearly understood that the students still were using the graph paper in a way that had little to do with how it would be employed by an expert user, and she asked them to reflect on what they were doing. She pointed out, "So, we have these numbers from 30 to 255. What would be a good way of showing our data to make sense?" This increasingly direct form of "other-regulation" (Wertsch, 1985) still did not result in the students' using the graph paper in a way that would organize the data into something

like a histogram, and the instructor switched from using questions and other forms of indirect other–regulation to a concrete proposal for how the graph paper should be used. Specifically, she suggested, "It would be possible to group the numbers in one square, like from this to this, and then put an X there for each value in that range, like a frequency table or histogram."

This seems to have generated a new insight in the students as to how the graph paper could be used as a cultural tool to get at the issues of central tendency and variation. They eventually turned to grouping their data in such a way that their presentation on the graph paper suggested – at least to the expert eye – central tendency and distribution. At the end of this session, the students were clearly much closer to an expert's perspective than they had been at the beginning of the session.

For a Vygotsky-Shpet approach to learning and instruction, the goal is to encourage students to master the use of cultural tools. Becoming more expert means being socialized into an existing social order, characterized by an existing set of cultural tools, and expertise is reflected in the ability to use these tools flexibly and fluently. Given that the goal is to socialize students to use socioculturally provided and sanctioned semiotic means, the issue is how to engage them in a way that will lead to increasing levels of expertise, and this is where material sign vehicles as entry-level mechanisms come into play. Thanks to these, it is possible to create initial levels of intersubjectivity when interlocutors have much different levels of understanding of what the task is and how to leverage that to higher levels of intersubjectivity and expertise.

The illustration involving students and instructors discussing ways to present data from a science experiment provides an example of this and also is revealing of how explicit and implicit mediation operate. What is perhaps most striking about this interaction is the degree to which the teacher and students were able to enter into a superficial level of intermental functioning on the basis of very limited agreement on the meaning of sign forms. Just as in Rommetveit's example of the man talking about carburetors with very little understanding of what the term means, the students participated in an exchange on the basis of very minimal understanding of what the teacher's words mean and what the graph paper was for.

In all the cases examined in this chapter the material sign vehicle is an essential part of the story. This sign vehicle could take the form of spoken words ("typical," "spread out"), graph paper, colored cards, and so forth, and it provided the foundation on which intersubjectivity and the mastery of sign meaning could grow.

CONCLUSION

Mediation is such a central category in Vygotsky's writings that it deserves careful scrutiny for anyone interested in his general approach. This is no easy task, however, given that Vygotsky seems to have had somewhat different thoughts at different points in his extensive writings. In some cases, he dealt with mediation as an issue of stimuli, stimulus means, and other terms from psychology, and in others he formulated it in terms of meaning, sense, and other semiotic constructs. In the former case, he seems to have been casting his analysis in a social language of the psychology of his day, and in the latter, he was harnessing a social language that belonged to a tradition of semiotics that can be traced to Shpet, Husserl, and Humboldt.

In an effort to bring some clarity to this complex picture, I have distinguished between two main categories of mediation in Vygotsky's writings: explicit and implicit. The former is explicit in the sense that it is intentionally and overtly introduced into problem solving activity, often by an outside party, and the materiality of the signs involved (e.g., colored cards in Leont'ev's Forbidden Colors Task or graph paper in the classroom illustration) tends to be obvious and nontransitory. In contrast, the latter is implicit in that it typically involves spoken language, whose materiality is transitory and seemingly ephemeral. The transparency of the signs in this case is exacerbated by the fact that they preexist in communication and are often not consciously or intentionally introduced into a problem solving or memory task setting as mediational means.

The two distinct theoretical traditions and social languages on which Vygotsky drew when developing his claims about *mediation means*, show that he discussed a range of quite disparate forms of sign processes under this general heading. However, the two forms of mediation can be seen as part of a larger theoretical framework when one considers some commonalities in the way he treated these forms. In particular, he viewed both forms of mediation under the general dictum that sign meaning develops.

As I have emphasized, this dictum rests on the separation of material sign form from sign meaning, and this semiotic insight is what motivated Vygotsky's critique of psychologists who failed to understand the dynamics of the relationship between these two elements. From his perspective, the development of mediated action involves a dynamic transition from minimal appreciation of the meaning and functional significance of a sign form to ever increasing levels of sophistication.

The distinction between explicit and implicit mediation that I have developed in this chapter is not so much a critique as an explication of Vygotsky's ideas. However, it is an explication with a mission, namely, to clarify discussion of these ideas and, hopefully, reduce the incidence of bogus disagreement as we seek to harness Vygotsky's conceptual system.