

Vygotsky and Whorf: A Comparative Analysis

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I. INTRODUCTION

Behind much of the current theorizing and empirical research in psychology and linguistics are implicit assumptions about the relationship between language and thought. Ironically, given its importance, the nature of this relationship is seldom explicitly discussed. In this chapter we hope to fill this lacuna somewhat and to stimulate discussion of this problem by a critical comparison of the ideas of two theorists who made the investigation of the relation of language to thought a central feature of their research, the Soviet psychologist and semiotician Lev Semenovich Vygotsky and the American linguistic anthropologist Benjamin Lee Whorf. In discussions of language and thought their ideas are often alluded to but seldom analyzed clearly or seriously.

II. BACKGROUND ON THE VIEWS OF VYGOTSKY AND WHORF

Vygotsky (1896-1934) and Whorf (1897-1941) were contemporaries, but they never met, and there is no indication that either read the other's work. They did, however, share some common intellectual influences, namely, the writings of linguists such as Sapir (1921) and psychologists such as the

behaviorist Watson and the Gestalt school. These shared roots may account for some of the similarities between their ideas, but many of the parallels are more coincidental than motivated. Perhaps more important were the dissimilar intellectual and social environments in which they worked and which gave rise to fundamentally different approaches.¹

A. Intellectual Context of Vygotsky's Work

Vygotsky produced all of his major writings on language and thought during the decade before his death (at age 37) in 1934. He lived and worked in what was perhaps the most exciting intellectual and social milieu of the 20th century—the Soviet Union between the Revolution of 1917 and the imposition of the full force of Stalinist repression in the mid-1930s.

Vygotsky was an enthusiastic participant in the task of building the new socialist state in the USSR. He wished to contribute to this effort by reformulating psychology. His reason for wanting to carry out this reformulation was two-fold. First, he wanted to provide a new Marxist theoretical groundwork for psychology. In particular, he wished to incorporate certain ideas about labor as a tool-mediated process, the social nature of human consciousness, and historical materialism in general into psychological theory. Second, he wanted to create a psychological theory that would provide guidelines for approaching some of the massive practical problems involved in building a new socialist state. In this connection he was particularly concerned with issues in instruction and development.

It is often unclear to Western psychologists what would be included in a Marxist psychology. For Vygotsky, two main points were essential. First, his reading of Marx led him to emphasize the social origins of human consciousness. In Vygotsky's view,

the social dimension of consciousness is primary in time and in fact. The individual dimension of consciousness is derivative and secondary, based on the social and construed exactly in its likeness. (1979, p. 30)

This meant that Vygotsky viewed social processes as providing the historical groundwork from which human mental functioning emerges. It also meant that social (or "interpsychological") processes give rise to individual psychological (i.e., "intrapyschological") processes in

¹It is not possible in this brief comparison to adequately summarize all the important ideas of either man. Interested readers are encouraged to consult their principal works, especially Vygotsky (1962, 1978) and Whorf (1956). Further discussion and justification of the interpretations of their views which are employed here can be found in Wertsch (1983, 1985) and Lucy (1985, 1987).

ontogenesis (Vygotsky, 1981, p. 163). The second point from Marx and Engels that was essential to Vygotsky's theoretical formulation is that human social processes (especially labor) are mediated by tools. Under this general heading of tools Vygotsky included "technical tools," which mediate humans' interaction with nonhuman objects, and "psychological tools," which provide the means for entering into social interaction with others and ultimately for planning and regulating one's own action. It is in connection with psychological tools or "signs" that Vygotsky made his most important and original contribution. His general claim was that the means used to regulate others and oneself play a very important role in determining the nature of the human mind. In his view we are as we are largely because of the mediational means we employ.

Alongside the writings of Marx and Engels, a second major force that shaped Vygotsky's approach was the intellectual milieu provided by the social sciences and humanities of his day. As Davydov and Radzikhovskii (1985) note, psychology was particularly important in this regard. Much of Vygotsky's approach emerged in response to the ideas of psychologists such as Piaget, the Gestaltists (especially Köhler), Pavlov, Thorndike, Stern, and James. Because Vygotsky wished to address the issue of the socio-historical evolution of tool and sign use, the work of several ethnologists was important for him. In this connection the work of the French ethnologist Levy-Brühl played a central role.

A third area of study that had a major influence on Vygotsky's ideas was semiotics. In this connection Husserl's account of signs and their relationship to objects and Sapir's writings on the role of generalization in communication were important. Furthermore, the writings of Humboldt and the Russian Formalists (e.g., Shklovskii, Yakubinskii) about the function of language influenced Vygotsky's thinking. In a nutshell, one could say that Vygotsky drew on psychology's ideas about mediated mental processes, tried to extend these ideas in light of semiotic theory, and borrowed from ethnology and social theory to explore phylogenetic, socio-historical, and ontogenetic changes in tool- and sign-mediated process.

B. Summary of Vygotsky's Approach

The intellectual setting in which Vygotsky lived and worked led him to create a particular approach to language and thought that emphasized three general themes: (a) genetic analysis; (b) social origins of uniquely human, higher mental functioning; and (c) semiotic mediation (Wertsch, 1983, 1985).

Vygotsky's insistence on using a genetic, or developmental, analysis was grounded partly in Marxist ideas about history, but it also was influenced by psychological theories of his day (e.g., Blonskii, Janet). In general, his

claim about genetic analysis was that it is possible to understand human psychological functioning only by understanding its origins and developmental transitions. According to Vygotsky, "We need to concentrate not on the *product* of development but on the very *process* by which higher forms are established" (1978, p. 64).

In Vygotsky's view, higher mental functions such as reasoning, voluntary attention, and logical memory emerge through a series of qualitative transitions or "revolutions" (Vygotsky, 1972). These transitions need to be examined in several "genetic domains" (Wertsch, 1985), including phylogenesis, socio-cultural history, and ontogenesis.

In ontogenesis, the domain Vygotsky and his colleagues studied in most concrete detail, the most important qualitative transition results from the collision of cultural patterns of social interaction and communication with the "elementary mental functioning" of the child. Vygotsky criticized other accounts of ontogenesis for failing to recognize that qualitative transformations are involved at such points. In his view most approaches were based on the assumption that a single dimension (e.g., the accumulation of stimulus-response associations or sexual maturation) could be used to account for all phases of ontogenesis.

In general, Vygotsky's notion of genetic analysis led him to argue (a) that human mental functioning can be adequately understood only by examining its origins and development and (b) that development in the various genetic domains involves qualitative, revolutionary transitions.

The second general claim that runs throughout Vygotsky's writings is that higher mental functioning in the individual (i.e., on the intrapsychological plane) derives from social interaction (i.e., functioning on the interpsychological plane). The most general formulation of this claim may be seen in Vygotsky's "general genetic law of cultural development:"

Any function in the child's cultural [or, higher mental] 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. This is equally true with regard to voluntary attention, logical memory, the formation of concepts, and the development of volition. (1981, p. 163)

Here again, Vygotsky's line of reasoning owes a great deal to Marx, but the influence of others is also evident. In particular, the influences of Janet and, somewhat ironically, Piaget are apparent.

The phenomenon that is perhaps best known in connection with this second theme in Vygotsky's writings is inner speech. In carrying out a genetic analysis of this phenomenon, Vygotsky focused on a speech form that Piaget had labeled "egocentric." In contrast to the latter's analysis, however, which assumed that egocentric speech is a reflection of solipsistic,

unsocialized thought, Vygotsky argued that it manifests the transition from social to inner speech.

This general theme may be summarized as follows. Uniquely human, higher mental functioning is inherently tied to the socio-cultural milieu in which it emerges. Vygotsky identified concrete mechanisms of internalization that make possible theoretical and empirical research on this tie between social and psychological processes.

The third theme that runs throughout Vygotsky's writings is his claim that semiotic systems such as human language mediate social and psychological processes. More than either of the other two themes mapped out above, it is this theme that makes his approach unique. Part of this uniqueness stems from the fact that his claim about semiotic mediation is analytically prior to the other two themes in his approach. This is so with regard to genetic analysis because the major qualitative transitions in his scheme are tied to the introduction of one or another form of mediation. In some cases this involves the "technical tools" of labor, and in others it involves "psychological tools" such as human language. With regard to the latter, Vygotsky wrote "as soon as speech and the use of signs are incorporated into any action, the action becomes transformed and organized along entirely new lines" (1978, p. 24).

Vygotsky's semiotic analysis is analytically prior to his claim about the social origins of higher mental functioning in the individual because the interpsychological and intrapsychological planes both inherently involve mediation. Furthermore, it is sign mediation that made it possible for him to link these two planes of functioning. His account of social, egocentric, and inner speech is again one of the best places to observe this line of reasoning.

For Vygotsky, the "genuine social interaction" characteristic of humans necessarily involves language. Among other things, this requires that experience be represented in terms of generalized categorical meaning. It also involves mastering aspects of the discourse structure of social speech such as its dialogic form. Thus, it is by participation in semiotically mediated social interactions that properties of human mental functioning such as categorization and dialogic reasoning emerge.

C. Intellectual Context of Whorf's Work

Whorf was a chemist by vocation, a linguist by avocation. Like Vygotsky, he produced the bulk of his significant work on language and thought within a very short period of time—all his major articles on this topic were written between 1936 and his death (at age 44) in 1941. The decisive influence on Whorf's intellectual life beginning in 1931 was his contact with

Edward Sapir. Sapir was one of a group of gifted students of Franz Boas who were reshaping anthropology in America.

Boas's central concern was to challenge the nineteenth-century evolutionary approaches in social science which understood so-called primitive peoples and their cultures as representing various stages in a unilinear development toward modern European racial and social forms (Stocking, 1968). In line with this there was an emphasis on the diversity of cultures, each with its own historical, psychological, and social configuration to be understood in its own terms (Boas, 1920). A central element in this project was the investigation of the native languages of the peoples of North America and of their psychological and cultural significance (Boas, 1911). Sapir, Boas's premier student in linguistics, explored the implications of language study for the understanding of culture and personality and developed in preliminary form the proposal that each language shapes the conceptual world of its speakers (Sapir, 1924, 1927, 1931). However, he did not undertake significant empirical research on this problem.

Whorf joined this developing tradition with a strong interest in linguistics and with a deep concern, born of his professional experience, with the problems of modern science (Carroll, 1956; Rollins, 1980). Under Sapir he began serious work on native American Indian languages, particularly Hopi, and soon found in the intricate grammatical patterns of these exotic languages ways of classifying and construing the world that were dramatically different from those of English and other European languages. His writings articulate these differences between Hopi and English with two ends. First, fitting with the interests of the Boasian school, he showed that these languages and their associated cultural forms were not inferior to the European, but rather represented sophisticated, comprehensive, and effective interpretations of reality. Second, fitting with his interests in modern science, he showed that a serious consideration of these languages could ground a critique of the fundamental assumptions and concepts of modern science.

Whorf's knowledge of psychology was not as developed as Vygotsky's, but he was conversant with the major schools in America at the time: experimental physiology, psychoanalytic, Gestalt, and behavioristic. He referred to the Gestalt school extensively, emphasizing both the importance of configurative pattern in language as its central operating principle and the significance of perceptual Gestalt phenomena as constituting a level of sublinguistic psychological regularity. He may have drawn his insights about the existence of underlying (or "covert") patterns in language from analogies with psychoanalytic approaches. However, he faulted all contemporary psychological theories for failing to deal adequately with meaning, and it is around the significance of patterns of meaning in language forms that he built his theory of the importance of

understanding language, and therefore culture, both for habitual thought and behavior and for science and philosophy.

D. Summary of Whorf's Approach

Whorf did not develop an explicit theory about how languages influence thought. Rather, he presented a series of programmatic discussions of the problem based on the general understandings about language held by the Boas-Sapir school and on his own specific comparative analyses of English and Hopi grammar.

A central premise of Whorf's argument is that language is composed not merely of forms but of meaningful forms. With a finite number of devices, each language must be able to refer to an infinite variety of experience. To accomplish this, languages select from and condense experience, classifying together as "the same" for the purposes of speech things which are in many ways quite different. These implicit classifications are not arbitrary but are based on meaningful criteria, and it is the meaningfulness of these language forms which give them their significance for thought. A language, then, essentially provides its speakers with a ready-made classification of experience which may be used as a guide for thought.

However, these linguistic classifications vary considerably across languages. Not only do languages differ as to the basic distinctions which are recognized but they also vary in the configuration of these categories into a coherent system of reference. Thus, the system of categories which each language provides its speakers is not a common, universal system but one peculiar to the individual language. Nonetheless, speakers tend to assume that the categories and distinctions of their language are natural and common to all people. Typically, they are unaware that other languages are different substantively as well as formally.

The crux of Whorf's argument is that these linguistic categories are in fact used as analogical guides in habitual thought. A speaker in attempting to interpret an experience will use a category available in his language. If this category subsumes other meanings under the same formal apparatus, a situation is set up whereby the speaker can unwittingly come to regard these other meanings as being intrinsic to the original experience. Thus, the point of Whorf's argument is not that the language category blinds the speaker to some obvious reality but, rather, that it suggests to him associations which are not *necessarily* entailed by experience. Further, because of the transparent, background nature of language, speakers do not understand that the associations they "see" are from language, but rather they

assume that they are "in" the external situation and patently obvious to all. In the absence of another language (natural or artificial) with which to talk about their experience, they will not be able to recognize the conventional nature of their linguistically based understanding.

For example, Whorf presented an example from English grammar which illustrates his approach. In the English language many tangible and intangible² entities are treated in the same way. Thus, the term *man* denoting a tangible entity and the term *day* denoting an intangible entity, a period of time, are both quantified in the same way. Both can be pluralized (*men*, *days*) and both can be modified by a numeral (*ten men*, *ten days*) just as if they were the same sort of term, that is, as if they denoted the same sort of object. By contrast, this is not the case in the Hopi language, which fact reveals that this linguistic treatment cannot be regarded as a direct reflection of a universally given classification of experience. Whorf described a number of similar related patterns elsewhere in English each of which contrasts with Hopi. He then brought these patterns together to show that there is a general tendency in English but not in Hopi to analyze intangibles as if they were object-like. He next traced out patterns of habitual thought and behavior which correspond to this linguistic tendency—certain characteristic ways of conceptualizing and dealing with "time" as if it were a concrete substance which can be measured and take on spatial shapes—and contrasts these patterns with the different approaches characteristic of Hopi culture. A central point of Whorf's argument is that these very broad analogical suggestions from language have great power and force both for individuals and for the culture at large precisely because they are both so pervasive and so transparent to speakers.

Three points deserve emphasis. First, Whorf's concerns were with large-scale patterns of analysis in languages and not with an individual classification or a jumbled assortment of unrelated differences. A corollary of this is that some important language classifications may not be heavily marked in the language's overt morphology and may require careful analysis to be properly delineated. Second, Whorf was concerned primarily with habitual thought. He did discuss the influence of language on scientific and philosophical thought but argued that these are specialized extensions of the much more widespread and common phenomenon of influence on habitual thought. And third, he was primarily concerned with the conceptual content of thought (e.g., such concepts as "time," "space," and "matter") and less with perception and other forms of cognitive processing as such.

²"Tangible" here is meant in the narrow sense as that which can be touched, that which has actual material form.

III. COMPARISON OF THE THEORIES

The principal difficulty in comparing the work of Whorf and Vygotsky is that the former was primarily a linguist and the latter was primarily a psychologist and each elaborated more on the materials over which he had a greater command. This obviously creates a multitude of asymmetries in detail and sophistication which constitute "differences," but not very meaningful ones. The approach taken here is to focus on the areas where there is sufficient material to establish a clear similarity or difference of some importance. The ideas of the two men are compared on several analytic dimensions so that essentially the same material is examined from a variety of perspectives.

A. Views on Language

Although Whorf and Vygotsky worked in quite different traditions, they shared the view that language is a social and cultural phenomenon. They both saw the primary function of language as being social, that is, enabling social communication, but they also both argued that it serves, through its use in thought, as one of the principal means by which individual thought incorporates social elements. Language makes this transformation possible because it contains within its forms a system of socially shared classifications of experience. The differences between the theoretical approaches of Whorf and Vygotsky should not obscure the significance of their common recognition that language serves as a primary mediator between the individual and society.

In developing his "cultural-historical" approach to mind, Vygotsky relied heavily on developmental comparisons in a variety of "genetic domains" such as phylogenesis, social history, and, most importantly, ontogenesis. In connection with language, he was chiefly concerned with the significance for thought and consciousness of the emergence of the capacity for speech in the species and of changes in structure and use within a given language across developmental or historical time, that is, in the individual or in society. We might summarize by saying that Vygotsky was primarily interested in *diachronic* studies of changes in the form and function of *speech* or of a single *language*. Thus, for example, when a child supplements the initial social or communicative function of speech with an individual or private function in the form of egocentric speech and later of inner speech (the chief formation of verbal thought), Vygotsky (1962, Chapter 7) emphasized that this represents a diachronic differentiation of a new function within the child's language.

Vygotsky did not examine in detail structural differences among natural languages. His assumption seems to have been that the particular surface appearances of language, that is, details of phonological and grammatical structure, were not the aspects of language that were of primary importance for understanding the relation of language as a social form to individual functioning. Rather, the key for him lay in the functions to which language was put, that is, its use in human activity, and in the existence of a semantic plane with some generalized meanings.

The premise of Whorf's comparative, anthropological approach was that human languages are genuinely different in important ways and yet have equally developed and valid ways of representing reality. Within this framework his goal was to document the diversity of language forms and to analyze the significance of this diversity for cultural and psychological life. Thus, by contrast with Vygotsky's diachronic comparisons within a single language, Whorf focused on *synchronic* comparisons across a variety of languages.

Thus, for example, the most extensive of Whorf's analyses (1956, pp. 134-159) involved contrasting the formal structures of Hopi and English and showing the importance of the differences for the expression of meaning in the two languages. These differences in linguistic meaning structure were then related to typical patterns of thought and behavior in the two societies. Cross-linguistic comparison of this sort was *the* methodological tactic in Whorf's approach and, in his view, absolutely essential for an adequate understanding of the true nature of language.

For the most part, Whorf did not address the internal differentiation of language functions (whether diachronically in ontogenesis or social history, or synchronically) although he did discuss the special uses of language in science and philosophy. His assumption seems to have been that grammatical categories affect psychological processes regardless of how these categories are incorporated into human action. The key factor for him was that the members of a society accept without question the basic meaning structure of their language, especially its grammatical component, whatever its functional applications. Further, Whorf showed no particular interest in phylogenetic and ontogenetic approaches.

So, in review, although Vygotsky and Whorf both insisted on the need to use a comparative method they used different axes of comparison, one diachronic, the other synchronic. In addition, although both were concerned with language, one was working primarily with a single language—as a representative of the general capacity for speech—while the other was working with a variety of languages.

Two further differences in their approaches, both involving their treatment of structure in language, stem in part from this latter contrast. The two men emphasized the importance of language structure, but they differed in

why they considered it important and they worked with different structural units.

Vygotsky considered structure in relation to specific functional implementations, that is, the purposes for which speech is used. Each new functional differentiation of speech beyond its basic use in dialogic oral communication presents certain opportunities for structural manipulation. In particular, different structural formations and degrees of elaboration are appropriate to and developed for new uses of language. Vygotsky chose word meaning as the structural unit that had both linguistic and conceptual value. So, in short, Vygotsky was concerned with the intellectual significance of the *functioning or use of word meaning*.

Thus, for example, in comparing egocentric speech (speech for oneself) with social speech (speech for others), Vygotsky stressed the greater structural abbreviation and the structural emphasis on the predicative characteristic of the former in comparison with the latter (Vygotsky, 1962, Chapter 7). These structural characteristics associated with egocentric speech were seen by Vygotsky as providing important indications of the nature of inner speech and, hence, of verbal thought. Slowly, the child moves toward verbal thought based on the use of pure, fully developed word meanings dissociated from the original external appearance of language, that is its phonetic and grammatical forms.

Whorf, on the other hand, considered structure in relation to the expression of meaning independent of any specific uses. First, for Whorf, "Sense or meaning does not result from words or morphemes but from patterned relations between words or morphemes" (1956, p. 67). He felt that the grammatical categories (as opposed to lexical items) are especially important in language and, ultimately, in thought, because they are involved, often obligatorily, in every utterance. Second, for Whorf, the utilization or choice of one linguistic structure as opposed to another itself conveys meaning. From a comparative perspective, the grammar of each language represents an implicit choice of structures and, in turn, embodies certain meanings, which, taken as a whole, constitute a coherent interpretation of reality that is peculiar to the particular language. In contrast, then, with Vygotsky's consideration of the function or use of word meaning, Whorf focused on the cognitive significance of structural meanings, that is the *implications of grammatical meaning*.

Thus, for example, in English the routine syntactic treatment of temporal cycles is the same pattern used for count nouns which typically refer to perceptible, well-bounded objects. This inevitably suggests some analogical equivalence, namely, that cycles have some of the qualities of these concrete objects such as discreteness of form, some sort of "substance," etc. That this is the case is shown by compatible treatments elsewhere in the grammar. (See the discussion in Whorf, 1956, pp. 139-148.) Further, since other languages

(e.g., Hopi) do not show the same pattern, the equivalence relation cannot be taken as a self-evident aspect of reality. Rather, such an equivalence must be considered to be a substantive, or meaningful, implication of the structural organization of the grammar of English as a whole. Such a complex of form-meaning relations, a worldview suggested by the overall configuration of the grammatical structure, is carried into all uses of the language—even the most specialized such as science and philosophy.

In short, both Vygotsky and Whorf were concerned with the structure of language, but one explored the relation of structure to different functional applications of speech and the other drew out the implications of differences in the basic structuring of meaning. Further, Vygotsky was primarily concerned with the word as a unit of analysis, while Whorf was concerned with the grammar as the unit of analysis. Thus, when they looked to the implications of language for thought, Vygotsky looked to the function or use of word meaning in a given language in the development of thought, and Whorf looked to the implications of grammatical meaning in a variety of languages for the characteristic thought patterns in a culture.

B. Views on Thought

It is important to recognize that neither Whorf nor Vygotsky denied the existence of some forms of thought independent of language. The existence of some forms of thought independent of language is presupposed by their attempts to show how language influences or transforms thought in important ways. However, in fact, they say very little about thought unaffected by language.

Vygotsky's view was that there is a form of prelinguistic thought that comes into contact with speech and is gradually transformed by it. The course of cognitive development in the child is essentially the product of bringing verbal thought into being:

A prelinguistic period in thought and a preintellectual period in speech undoubtedly exist also in the development of the child. Thought and word are not connected by a primary bond. A connection originates, changes, and grows in the course of the evolution of thinking and speech. (Vygotsky, 1962, p. 119, copyright © by MIT Press. Reprinted by permission)

There are a number of other passages in Vygotsky's writings that appear to refer to an independent plane of thought in more mature individuals, but the context of the argument always makes clear that the "thought" referred to in these passages has already been transformed by language. And the more sophisticated forms of thought, characterized by differentiation, systematicity, and control, which were the focus of Vygotsky's concern, all clearly involve a linguistic component.

Whorf, too, accepted the partial autonomy of thought from language. Thus, he identified thinking "as the [psychological] function³ which is to a large extent linguistic" (1956, p. 66), and he clarified that he did not believe thinking to be entirely linguistic. An argument can also be made that Whorf recognized the existence of an underlying, almost perceptual level in thought which speakers could access on occasion, but he clearly felt that linguistically influenced thought was by far more important (see Lucy, 1987, Chapter 2, for a discussion).

There is a second similarity between the two approaches, namely, that both men focused on concepts as an essential aspect of thought. Vygotsky stressed the importance of abstraction and generalization in the formation of complexes, and of generalizations about generalizations in the formation of genuine concepts. And Whorf was largely concerned with an individual's abstractions, classifications, categories, and types, etc. However, Whorf's treatment of thought was much less complete than Vygotsky's, which makes further comparison on this point difficult.

As with their views on language, a major difference in their views on thought stems from the difference between the diachronic, genetic point of view used by Vygotsky as opposed to the synchronic, comparative point of view used by Whorf. This difference interacts with a second major contrast, namely, that between Vygotsky's concern with the different formal types of conceptual thought emerging through development, especially those associated with modern science and school instruction, and Whorf's contrasting concern with the diverse substantive content of conceptual thought characteristic of different cultural groups.

The bulk of Vygotsky's work consisted of observations and experiments directed at understanding the intellectual development of the child. In this he had two central concerns: (a) to provide a principled description of the various modes of thought during development and (b) to account for the child's progression toward the more sophisticated types of thinking characteristic of adults. Vygotsky described a large number of incremental steps in the development of the child's concepts. These incremental steps were later reformulated in terms of more general principles such as increasing degrees of control, abstraction, and systematicity characteristic of true, or scientific, concepts. Thus, his principal concerns were the *form and function of concepts* (not their specific content) and the development of the higher mental functions, especially of *scientific concepts*. Crucial to this developmental unfolding are the role of adult instruction, including schooling, and the emerging capacity for inner speech.

Whorf's work consisted of observations and analyses aimed at an understanding of diverse cultural modes of conceiving reality. His concerns were to

³Whorf employed Jung's classification of four basic psychic functions here: sensation, feeling, thinking, and intuition.

describe the meaningful interpretations of experience that permeated everyday action and to account for the cultural diversity in such interpretations. Thus, he was interested in the *form and content of concepts*, rather than their specific functions. On the one hand, this perspective led Whorf away from concern with special uses of formal thought characteristic of Western societies (e.g., school concepts, scientific concepts) and toward a consideration of *habitual thought*, for it is the latter that permeates all aspects of everyday life and that is most relevant to a comparison across societies. When Whorf did consider special uses such as scientific and philosophical thought, he emphasized their intimate connections with habitual thought:

From each . . . unformulated and naive world view, an explicit scientific world view may arise by a higher specialization of the same basic grammatical patterns that fathered the naive and implicit view. (1956, p. 221, copyright© by MIT Press. Reprinted by permission)

In short, fundamentally different research perspectives and problems guide the two views of thought. Vygotsky was concerned with a diachronic, or genetic, exploration of the forms and functions of conceptual thought, especially scientific concepts. Whorf focused on a synchronic comparison of the form and content of conceptual thought, especially habitual thought characteristic of everyday life. The problem for Vygotsky was to understand how thought becomes *developmentally transformed*, that is, becomes more abstract, systematic, and consciously controlled; his answer was that this happens through the socialization of individual thought by speech (i.e., speaking *some* language). The problem for Whorf was to understand how thought becomes *culturally contextualized*, that is, bound to a cultural perspective; his answer was that this happens through the enculturation of thought by a particular language.

Finally, neither man treated the problem of the functions of thought itself adequately. Whorf never addressed either the general or the specific functions served by conceptual thought—although we may presume from his examples that it serves both for interpreting reality and guiding practical activity. Vygotsky did make some general remarks about the functions of thought, noting that “every thought creates a connection, fulfills a function, solves a problem” (1962, p. 149). Although there are a few other suggestions about function in Vygotsky’s work, for example that some problems require consciousness and reflection for their solution, very little is said about the specific structure of functional demands that thought is pressed to meet.

C. Views on Language–Thought Connections

As noted in the previous section, both Whorf and Vygotsky argued that language and thought are not identical. Neither devoted serious attention to

the influence of thought on language but, rather, focused on the influence of language on thought. In doing so they faced certain common problems: (a) establishing why and/or how a connection between language and thought comes about, (b) explaining exactly what the nature of the connection is, that is, the effects this connection has on thought, and (c) articulating the significance of these effects.

For Vygotsky, the connection between language and thought is formed in childhood. The child first learns to speak as a social activity (speech for others), acquiring word meanings without being aware of their conceptual potential. Then the child begins to use speech as an aid in thought, initially in the form of egocentric speech (speech for oneself) and, later, in the form of inner speech. The existence of egocentric speech is pivotal in Vygotsky’s theory because it provides an external precursor to inner speech which can be studied for clues to the nature of verbal thought itself. However, Vygotsky did not specifically account for the differentiation of the egocentric function from the social function of speech, that is, he did not explain what general or socio-historically particular developmental problem leads to this differentiation. In any event, it is through egocentric speech, and later inner speech, that language becomes one of the mediational means whereby social influences penetrate individual thinking.

There are no parallels to these views in Whorf’s writings because he was really not concerned with the direct use of language forms in thought through actual inner speech. Rather, he was interested in the impact that the patterns of meaning structure implicit in language have on thought:

Sense or meaning does not result from words or morphemes but from patterned relations between words or morphemes. . . . It is not words mumbled, but RAPPORt between words, which enables them to work together at all to any semantic result. It is this rapport that constitutes the real essence of thought insofar as it is linguistic. (1956, pp. 67–68)

Because he was interested in this *rapport* and not in linguistic *utterances* as such, he did not attempt to demonstrate the actual use of words and sentences in thought but, rather, attempted to establish the use of the patterns of meaning implicit in them for the interpretation of experience. And since he could not, therefore, appeal to egocentric speech to demonstrate directly the use of speech in thought, Whorf had to infer the connection of language patterns with thought from secondary evidence such as parallel individual or social behavior patterns. But Whorf, like Vygotsky, gave no account of why speakers employ these patterns, that is, what functions they serve in thought.

In Vygotsky’s approach, once speech and thinking are linked each continues to develop, but now these formerly separate developments have implications for each other. The relation between thought and word is a

dynamic, interactive process, and we can characterize the *relation* between thought and language itself as developing. In this development language provides the crucial shaping input, because through the acquisition of word meanings the child, without being aware of it, begins to master forms which contain within them the seeds of future adult concepts.

A major transformation in the form of concepts which results from this developmental association of thought with speech is the differentiation of thought and its expression in sequential form:

Thought, unlike speech, does not consist of separate units. . . . I conceive of all this in one thought, but I put it into separate words. . . . In his mind the whole thought is present at once, but in speech it has to be developed successively. (1962, p. 150)

Furthermore, verbal thought becomes more abstract, more systematic, and more subject to conscious control. In short, then, verbal thought develops its own dynamic, which leads to the emergence of the higher forms of mental functioning.

The nature of the connection, the linkage, between language and thought was somewhat different in Whorf's approach. Every language contains a series of formal equivalences, each based on some analogy, some common element of meaning. Such equivalences bring together into a common category constellations of meanings, that is, they incidentally involve elements that were not part of the original basis of the category. These analogical equivalences are then available to serve as a channels or grooves for thought, suggesting interpretations of experience not merely based on the primary substantive basis of the category but on the incidental associations as well.

Thus a speaker is led to involve the whole web of linguistic connections in his habitual thought, typically without being aware he is doing so. And, because the analogies are not the same in all languages, that is, grammars differ, use of these categories necessarily guides thought in a way characteristic of the given language and culture and not along universally preordained lines of thinking. There is of course some feedback from thought to language, but in Whorf's view language is the more important of the two since it is the more systematic. Thus, it is again language which guides thought, although not to a higher level of development but to a culturally specific interpretation of experience.

In Vygotsky's view, there were three significant implications of the transformation of thought by language, of their fusion into a joint developmental process. First, the nature of psychological development itself is changed from a biological to a socio-historical process:

Thought development is determined by language, i.e., by the linguistic tools of thought and by the sociocultural experience of the child. . . . The child's intellectual growth is contingent on his mastering the social means of thought, that is, language. . . . *The*

nature of the development itself changes, from biological to sociohistorical. Verbal thought is not an innate, natural form of behavior but is determined by a historical-cultural process and has specific properties and laws that cannot be found in the natural forms of thought and speech. (1962, p. 51, italics in the original)

Second, this interrelation of language and thought enables the emergence of the higher mental functions—abstract, systematic, and subject to conscious control—which uniquely characterize human thought in general and the advanced forms of thinking characteristic of modern societies in particular. Third, by transforming thought in this way language provides the essential ground for the development of human consciousness.

For Whorf, too, language was the most distinctive aspect of human activity, and he referred to speech as "the most human of all actions. The beasts may think, but they do not talk" (1956, p. 220). And he recognized the critical role of speech in the development of mind beyond the mere personal level and in scientific activity. But for Whorf, the most important consequence of the language and thought interaction was that it led to the cultural contextualization of thought, what he referred to as

the "linguistic relativity principle," which means, in informal terms, that users of markedly different grammars are pointed by their grammars toward different types of observations and different evaluations of externally similar acts of observation, and hence are not equivalent as observers but must arrive at somewhat different views of the world. (1956, p. 221)

He sought to trace the importance of this relativity not only for everyday life but also for the supposedly more universal understandings of modern science. He mocked the *conceit* of modern man, unaware of the highly specific patterns shaping his intellectual understanding, that his forms of knowledge or of consciousness are somehow superior to that of other peoples. The essential route to a genuine advance in consciousness lies in coming to recognize the relative nature of linguistic categories and, ultimately, of human thought.

In summary, for Vygotsky language transforms thought, making it social in nature, and this accounts for the emergence of the higher conceptual forms. Thus Vygotsky interpreted the influence of language on thought in terms of its *significance for the development of human consciousness*. For Whorf language constrains thought, guiding it in culturally specific patterns. Thus Whorf interpreted the influence of language on thought in terms of its *implications for the limits of human awareness*.

IV. IMPLICATIONS FOR FUTURE RESEARCH

Although these two approaches are very different, in many respects they complement rather than contradict each other. It is this complementarity

that is most suggestive for future research and which we wish to single out here for special comment. Future research on the significance of language for thought will profit from a creative integration of important features from both approaches. Three implications of an integrated approach seem especially important to us and will serve to illustrate what we mean by a constructive use of both theories to build a more adequate approach to understanding the relation between language and thought.

One implication of an integrated approach is that the use of language in thought not only provides certain advantages but also entails certain costs. Thus, by providing a set of socially shared generalizations, a set of classifications of experience, every language provides a ready-made route for each child to develop characteristically human forms of conceptual thought and consciousness. However, the child can develop in this way only by utilizing a particular language along with its specific categories, and this specificity sets a certain direction to habitual thought that is extraordinarily difficult to surmount, in essence a linguistic relativity. Thus a unified approach would acknowledge both the potential advantages recognized by Vygotsky and the costs emphasized by Whorf.

A second implication of an integrated approach is that any linguistic relativity should increase during development. Early intellectual activity involving the elementary mental functions should be relatively free of linguistic influences. As language becomes involved in thought and the child begins to develop complexes along adult lines, these should show some relation to the specific categories in the adult language. As the child develops true concepts which are abstract and have systematic internal relations one to another, the way of organizing experience characteristic of the language should become even more apparent.

A third implication of an integrated approach is that there may indeed be general historical changes in the uses of language. Those modes of thought which use or rely on language forms most heavily are exactly those which will be most bound by it. By focusing primarily on the form-meaning structures wherein all languages are equivalent (though not identical) as interpretive devices, Whorf was led to minimize the significant historical evolution of the uses of language in thought. But if, as Vygotsky suggested, there is a general development in the way language is used in thought—heavier, more systematic, and more explicit reliance on language in modern society—it will not only produce new, perhaps more sophisticated types of conceptual forms, but it may also amplify the impact of the *particular* interpretive forms (grammars) of the languages involved. Thus, layered over a general relativity based on the shaping force of linguistic rapport would be a second more specific level of relativity grounded in the cultural reliance on and, ultimately, reification of specific grammatical and lexical forms, characteristic of modern Western societies. Whorf seemed to have recognized the possibility and

potential significance of such an amplification in one of his last writings where he criticizes the human tendency to use language "to weave the web of . . . illusion, to make a provisional analysis of reality and then regard it as final." He continued by emphasizing that "Western culture has gone farthest here, farthest in determined thoroughness of provisional analysis, and farthest in determination to regard it as final" (1956, p. 263).

In summary, we can see that although the views of Vygotsky and Whorf are quite different, their approaches are, on the whole, more complementary than contradictory. Through an investigation that integrates the strengths of Vygotsky's diachronic, historical-developmental approach with Whorf's synchronic, comparative-interpretive approach, a more adequate understanding of the role of language in human thought can be achieved.

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