

Commentary

The Complementary Contributions of Halliday and Vygotsky to a “Language-Based Theory of Learning”*

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There can hardly be a topic of greater interest to readers of this journal than the one announced in the title of Halliday’s recent article: “Towards a language-based theory of learning” (hereafter, LTL).¹ It is also a topic that is of particular educational importance at this time when, fired by the symbolic significance of the approaching start of a new century, reformers plan major changes in the content of the school curriculum and in the manner in which it is to be enacted. For curricular reform is very much a matter of social semiotics and, whether explicitly recognized or not, any particular policy proposal is necessarily based on assumptions about the relationship between language and learning. In discussing plans for change, therefore, it behooves those of us who believe language to have a central and unique role in learning—both in school and out—to make our beliefs clear and explicit and to provide warrant for them that is based not just on the evidence of good practice but also in a coherent body of theory and research.

In this context, Halliday’s article is particularly timely. In its opening paragraph, it is also explicit in stating the premises on which such a theory must be built.

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When children learn language, they are not simply engaging in one type of learning among many; rather, they are learning the foundations of learning itself. The distinctive characteristic of human learning is that it is a process of making meaning—a semiotic process; and the prototypical form of human semiotic is language. Hence the ontogenesis of language is at the same time the ontogenesis of learning.

This being so, a good strategy for understanding human learning in general, Halliday proposes, would be to study how “children construe their resources for meaning—how they simultaneously engage in ‘learning language’ and ‘learning through language’, . . . [for] . . . language is the essential condition of knowing, the process by which experience becomes knowledge” (LTL, pp. 93–94).

In LTL, it is language learning that is the focus of attention, and much of the detail of Halliday’s earlier work on this topic is consolidated in his account of the 21 features that he considers critical for a language-based theory of learning. These also provide the basis for the culminating theoretical step in this article: the postulation of a three-step model of human semiotic development (p. 111).

Inevitably, however, given the limitations of space, there are many other aspects of his theory that Halliday barely touches on. Most notable of these, in my view, is the child’s learning *through* language, which occurs in and as a result of the very same conversations that provide the occasion for language learning. As he himself intimates, an adequate language-based theory of learning must include both these perspectives and, indeed, an exploration of their relationship has been the subject of several of his publications, starting with his book-length study, *Learning How to Mean* (Halliday, 1975). Part of my aim in writing this response, therefore, is to provide a sketch of this broader theory, as I have understood it, in order to set LTL in context.

I also have a further aim, which is more personal in origin. During the many years that I have been involved in work on language and learning, I have been influenced by the work of two scholars above all others. The first of these is Halliday, whose functional approach to language, which gives emphasis to both system and behavior, has provided support for my conviction that the explanation of language development is to be found in the study of conversational interaction. In systemic linguistics I also found a framework within which to devise the coding scheme to be used in the analysis of the large corpus of longitudinal data that my colleagues and I were collecting (Wells, 1985). My other mentor was Vygotsky, whose works I eagerly read as they appeared in English translation. His characterization of verbal thought as inner speech—the last stage in the internalization of social conversation—has never ceased to intrigue me. But, above all, Vygotsky has helped me to understand the role of parents and other teachers in the learning process, which, like Halliday, he sees as being performed quite largely through conversational interaction.

In all this time, then, I have thought of the work of Halliday and Vygotsky as

highly compatible and—in many important ways—complementary. To my surprise, however, Halliday himself has never drawn attention to this similarity, and it is only quite recently that his colleagues and students have begun to do so. A particular incentive to accept the invitation to respond to Halliday's article, therefore, was that it would involve a systematic exploration of the extent of the similarity that I believed to exist.

In this article, then, I shall compare the work of these two theorists by focusing on a limited number of what I consider to be central issues for a language-based theory of learning. From the comparison, it will become clear, I believe, that both Vygotsky and Halliday have important and compatible contributions to make to this enterprise and that by combining their contributions, we can indeed make significant progress in the construction of such a theory.

LONG-TERM GOALS AND THE CHOICE OF A GENETIC APPROACH

There can be no doubt that both Vygotsky and Halliday have made major contributions to their chosen disciplines, Vygotsky in psychology and Halliday in linguistics. However, because of the breadth of their conceptions of their subjects, the impact of their work has also been felt far beyond their "home" disciplines and perhaps nowhere more strongly than in the field of education. Indeed, both scholars devoted a considerable amount of energy to putting their theoretical ideas to practical use in attempts to improve the quality of children's educational experience. For much of his professional life, Vygotsky had a substantial involvement in the education of the mentally retarded, and some of his most important ideas about the relationship between teaching and learning developed out of his research in the Laboratory of Psychology for Abnormal Childhood, which he founded in Moscow in 1925 (Vygotsky, 1978; Wertsch, 1985). Halliday has also had an ongoing involvement in education, both in the Nuffield Programme in Linguistics and English Teaching at University College London, from 1964 to 1971, and in his many collaborations with educators in Australia (Hasan & Martin, 1989). However, in both cases, the work that has probably had the greatest long-term educational impact through its influence on the thinking of teachers and teacher-educators has been their developmental studies of language and learning. In both cases, too, the undertaking of this research was part of a larger program, in which the choice of a "genetic" approach was seen as methodologically imperative.

In Vygotsky's case, his work on thinking and speech was part of a comprehensive attempt, in the years following the Russian Revolution of 1917, to establish psychology on a more adequate theoretical foundation, based in part on Marxist principles. An essential prerequisite for this enterprise was the creation of an appropriate methodology for the study of human development and, in particular, of the development of what he called "the higher mental functions."

Much of this work was conducted through writings of a theoretical and somewhat polemical nature, as he took issue with what he considered to be the inadequacies of others' research. It was in this context that he formulated what he called the genetic method.

In associationistic and introspective psychology, analysis is essentially description and not explanation as we understand it. Mere description does not reveal the actual causal-dynamic relations that underlie phenomena.

K. Lewin contrasts phenomenological analysis, which is based on external features (phenotypes), with what he calls genotypic analysis, wherein a phenomenon is explained on the basis of its origin rather than its outer appearance. . . . Following Lewin, we can apply this distinction between the phenotypic (descriptive) and genotypic (explanatory) viewpoints to psychology. By a developmental study of a problem, I mean the disclosure of its genesis, its causal dynamic basis. By phenotypic, I mean the analysis that begins directly with an object's current features and manifestations. (Vygotsky, 1978, p. 62)

Vygotsky's empirical study of concept development, which is reported in Chapter 5 of *Thinking and Speech* (1987), is an example of his application of the genetic method. However, the study of mental functioning over the course of individual development (ontogenesis) is not the only domain in which this approach is to be applied. In fact, Vygotsky specifies four domains in which a genetic approach is required in order to provide an adequate account of human mental processes. These are phylogenesis (development in the evolution of the human species), sociocultural history (development over time in a particular culture), ontogenesis (development over the life of an individual), and microgenesis (development over the course of, and resulting from, particular interactions in specific sociocultural settings). More recent work in the Vygotskian tradition has tackled all these domains, although the greatest emphasis has been on the ontogenetic and microgenetic analysis of development.

However, as Wertsch and Tulviste (1992) emphasize, in their overview of Vygotsky's contribution to developmental psychology, he was not arguing that development in each of these domains is simply a recapitulation of the preceding ones. Each has its own explanatory principles.

The use and "invention" of tools in humanlike apes crowns the organic development of behavior in evolution and paves the way for the transition of all development to take place along new paths. It creates *the basic psychological prerequisites for the historical development of behavior*. Labor and the associated development of human speech and other psychological signs with which primitives attempt to master their behavior signify the beginning of the genuine cultural or historical development of behavior. Finally, in child development, along with processes of organic growth and maturation, a second line of development is clearly distinguished—the cultural growth of behavior. It is based on the mastery of

devices and means of cultural behavior and thinking. (Vygotsky & Luria, 1930, pp. 3–4, quoted in Wertsch & Tulviste, 1992, p. 551)

Nevertheless, despite the differences of substance between these domains, the reason for adopting a genetic approach remains constant: In any domain, the present state can only be understood by studying the stages of development that preceded it.

To a considerable extent, the same reasons influenced Halliday in his decision to approach his study of language development from an ontogenetic perspective. However, in terms of his overall goals as a linguist, the genetic approach serves a further purpose. One formulation of this is found in a discussion with Herman Parret (Parret, 1974):

. . . when we investigate the nature of the linguistic system by looking at how [the] choices that the speaker makes are interrelated to each other in the system, we find that the internal structure is in its turn determined by the functions for which language is used . . . We then have to take one more step and ask how it is that the linguistic system has evolved in this way since, as we have seen, the abstract functional components are, although related to, yet different from the set of concrete uses of language that we actually find in given situations. This can best be approached through studies of language development, through the study of how it is that the child learns the linguistic system. (reprinted in Halliday, 1978, pp. 52–53)

Halliday's interest in ontogenesis is thus motivated, in part, by the light that it can throw on the phylogenetic development of human language in general, as exemplified in the particular historical and cultural phenomenon of the English language. In this respect, he is working in the opposite direction from Vygotsky. If Vygotsky's ultimate target is an explanation of individual mental functioning, Halliday's might be said to be the nature and organization of language as a resource for human social living.

And it is this concern with the contribution of language to social living that provides the organizing principle in terms of which Halliday's larger program can best be understood. To a degree, therefore, his genetic stance is also part of his more general attempt to rectify the imbalance he sees in much recent work in linguistics, where the interest in an idealized, ahistorical, and acultural "linguistic competence" has led to a disregard of what people actually say and of the uses to which language is put in actual situations. In contrast, the linguistic theory that Halliday and his colleagues have developed is inherently social and functional in orientation. Treating language as simultaneously system and resource, code and behavior, Halliday's goal is to explain, within any particular cultural and linguistic community, what people can mean and how they use their linguistic resources to do so.

LANGUAGE AND SOCIAL ACTIVITY

For both Vygotsky and Halliday, then, language is a human “invention” which is used as a means of achieving the goals of social living. And the best way to understand it, they both believe, is by adopting a genetic approach to the study of the ways in which it functions as a tool in the situations in which it is used.

Vygotsky’s Conception of Language as Semiotic Tool

Vygotsky develops this insight in terms of semiotic mediation, based on an analogy with the mediating function of material tools in human activity. As Cole (in press) points out, explicating Vygotsky’s ideas on this subject, all tools have a dual nature as artifacts: They are simultaneously both material and ideal, and so require of their users both physical and intellectual activity.

They are ideal in that they contain in coded form the interactions of which they were previously a part and which they mediate in the present (e.g., the structure of a pencil carries within it the history of certain forms of writing). They are material in that they are embodied in material artifacts. This principle applies with equal force whether one is considering language/speech or the more usually noted forms of artifacts such as tables and knives which constitute material culture. What differentiates a word, such as “language” from, say, a table, is the relative prominence of their material and ideal aspects. No word exists apart from its material instantiation (as a configuration of sound waves, or hand movements, or as writing, or as neuronal activity), whereas every table embodies an order imposed by thinking human beings.

Vygotsky’s interest was in the transforming effect of introducing tools into the relationship between humans and their environment and, in particular, in the effect of signs used as psychological tools to mediate mental activity:

By being included in the process of behavior, the psychological tool alters the entire flow and structure of mental functions. It does this by determining the structure of a new instrumental act, just as technical tool alters the process of a natural adaptation by determining the form of labor operations. (Vygotsky, 1981, p. 137)

Vygotsky identified a variety of sign-based tools that function in this way—various systems for counting, mnemonic techniques, works of art—but the one that he undoubtedly considered to be of greatest significance—the “tool of tools”—was language. For language not only functions as a mediator of social activity, by enabling participants to plan, coordinate, and review their actions through external speech; in addition, as a medium in which those activities are symbolically represented, it also provides the tool that mediates the associated mental activities in the internal discourse of inner speech (Vygotsky, 1987).

In fact, it was inner speech that most interested Vygotsky (as we shall see

below) and its origins in the social speech that accompanied problem-solving activities of various kinds in situations of face-to-face interaction. For this reason, apart from his general statements on the relation between language and culture, Vygotsky has rather little to say about the role that semiotic mediation plays, in every social encounter, in both instantiating the culture and in recreating and modifying it.

Halliday's Conception of Language as Social Semiotic

This lacuna has been amply compensated for by Halliday, who has devoted much of his career to exploring this reciprocal relationship between language and culture—although this is only hinted at in his recent article in this journal (LTL). To gain a better appreciation of the scope of his work from this perspective, one needs to read some of the other articles referenced there. A particularly helpful source is the collection published as *Language as Social Semiotic* (1978). The following passage, taken from his introduction to that collection will serve to give an idea of his overall conception of the field.

A social reality (or a 'culture') is itself an edifice of meanings—a semiotic construct. In this perspective, language is one of the semiotic systems that constitute a culture; one that is distinctive in that it also serves as an encoding system for many (though not all) of the others.

This in summary terms is what is intended by the formulation 'language as social semiotic'. It means interpreting language within a sociocultural context, in which the culture itself is interpreted in semiotic terms—as an information system, if that terminology is preferred.

At the most concrete level, this means that we take account of the elementary fact that people talk to each other. Language does not consist of sentences; it consists of text, or discourse—the exchange of meanings in interpersonal contexts of one kind or another. The contexts in which meanings are exchanged are not devoid of social value; a context of speech is itself a semiotic construct, having a form (deriving from the culture) that enables the participants to predict features of the prevailing register—and hence to understand one another as they go along.

But they do more than understand each other, in the sense of exchanging information and goods-and-services through the dynamic interplay of speech roles. By their everyday acts of meaning, people act out the social structure, affirming their own statuses and roles, and establishing and transmitting the shared systems of value and of knowledge. (p. 2)

One particularly powerful way of approaching this two-way relationship between language and social structure is through the study of variation, both the dialectical variation that expresses the diversity of social structures of a hierarchical kind and the register variation that expresses the diversity of social processes—what is being done, who is involved in doing it, and the semiotic means that they are using.

But these variations in language behavior do not simply express the social structure.

It would be nearer the point to say that language *actively symbolizes* the social system, representing metaphorically in its patterns of variation the variation that characterizes human cultures. . . . It is this same twofold function of the linguistic system, its function both as expression of and as metaphor for social processes, that lies behind the dynamics of the interrelation of language and social context; which ensures that, in the microencounters of everyday life where meanings are exchanged, language not only serves to facilitate and support other modes of social action that constitute its environment, but also actively creates an environment of its own, so making possible all the imaginative modes of meaning, from backyard gossip to narrative fiction and epic poetry. The context plays a part in determining what we say; and what we say plays a part in determining the context, (1978, p. 3)

This concept of the mutually constituting role of language and social context is most fully developed in Halliday's work on register and in his own and his colleagues' work on genre (see, e.g., Halliday, 1978; Halliday & Hasan, 1985; Martin, 1992). All instances of language use occur—or, putting it more dynamically, all texts are created—in particular social contexts. Of course, each event is unique in its details but, for the participants to be able to co-construct the text, they have to interpret the context as an instance of a recognizable "situation-type" and to make their interpretation recognizable to their coparticipants. This they do, Halliday proposes, in terms of their knowledge of the regular patterns of cooccurrence that exist between particular semiotic properties of the situation and particular choices from the semantic resources that make up the culture's linguistic meaning potential (register) and of the way in which these choices are sequentially deployed in the staged organization of the event (genre).

Thus, one way of thinking about register is as prediction: Given a particular context of situation—a "situation-type"—certain semantic features have a much higher probability of being selected than others in the construction of the associated texts. However, only some of the features of the situation are relevant in categorizing situation-types, Halliday suggests, and these can be captured under three headings, or dimensions: "field," "tenor," and "mode." Field concerns the social action that is involved—what is going on; in the case of certain types of event, this semiotic content may be referred to as the "subject matter." Tenor is concerned with the who of the event—the participants and their relationship to each other, considered from the point of view of status and their roles in the event. Mode refers to the choice of channel on the spoken-written continuum and to the role assigned to language in the event. Together, these features of the situation predict the semantic configurations that are likely to occur in the text that is constructed; or, to put it differently, the participants' interpretation of the situation in terms of these dimensions predisposes them to make certain types of choice from their meaning potential in co-constructing their text.

Register thus accounts for the probabilistic relationship between particular situation-types and the meaning choices most likely to be realized in the texts that are constructed in relation to them. However, it does not account for the sequential organization of those meanings as a text which enacts a particular culturally recognizable type of activity in that situation. For this, the concept of genre is more appropriate. Described by Martin, Christie, & Rothery (1987) as "a staged, goal-oriented social process," a genre specifies the elements (or "significant attributes"), both obligatory and optional, that constitute the process and the sequence in which they occur. In her exposition of the concept of genre, Hasan (1985) glosses "element" as "a stage with some consequence in the progression of the text" (p. 56), and she uses the text of a service encounter in a fruit and vegetable store as an illustration. Any such text, she argues, must contain the elements of "sale request," "sale compliance," "sale," "purchase," and "purchase closure," in that order. Other elements, such as "greeting," "sale initiation," or "finis" (leave-taking), are optional. However, if they do occur, their sequential position is also fairly tightly constrained.

Exactly how the relationship between register and genre should be conceptualized is still a matter of considerable debate (Hasan, *in press*; Martin, 1992), but it is clear that between them, these two concepts provide a powerful means of explaining the predictability of the texts that are produced in particular situational contexts. Conversely, they also explain how, from the text so far produced, the participants are able both to coordinate their interpretation of the situation and to determine how to proceed with the activity/text construction (Halliday, 1984).¹

Before leaving the topic of the relationship between language and social context, it is important to emphasize that Halliday conceives the relationship as a reciprocal one: Although the way in which we interpret the context of situation largely determines what we say, it is true that what we say plays a part in determining the situation. This is particularly significant, from an educational point of view, when we consider attempts to bring about educational change. As I have pointed out elsewhere (Wells, 1993b, *in press*), teachers are not entirely constrained by traditional definitions of the situation-types that constitute a typical "lesson." By making different choices from their meaning potential, particularly with respect to tenor and mode, they can significantly change the register and genre that prevail and thereby create different learning opportunities for their students.

From what has been said in the preceding paragraphs, it can be seen that, although Halliday and Vygotsky are in agreement in seeing language as a cultural tool that has been developed and refined in the service of social action and interaction, the ways in which they have explored this insight have led them in different directions. While not denying the importance of an "intra-organismic" orientation, Halliday has chosen to adopt the complementary "inter-organismic" alternative, focusing on language as social behavior (1978, pp. 12–13). Vygotsky, on the other hand, as it were, taking for granted the results of Halliday's

research, has been concerned with the implications for individual mental development of participation in linguistically mediated social interaction. Both are united, however, in their interest in the part that language plays in the development of the individual as a member of a particular culture. And it is to this that we shall turn in the following section.

LEARNING LANGUAGE: APPROPRIATING CULTURE

With respect to their general conceptions of what is involved in learning a first language, there can be little doubt that Vygotsky and Halliday are in accord. Halliday's account of the beginning stages will serve to set the stage.

Children are predisposed, from birth, (a) to address others, and be addressed by them (that is, to interact communicatively); and (b) to construe their experiences (that is, to interpret experience by organizing it into meanings). Signs are created at the intersection of these two modes of activity. Signs evolve (a) in mediating—or, better, in enacting—interaction with others, and (b) in construing experience into meaning. (LTL, pp. 94–95)

The example which follows the above quotation also makes it clear that Halliday considers the creation of signs to be a joint construction by infant and adult in the course of specific social interactive events:

Thus typically at 0;3–0;5 babies are “reaching and grasping,” trying to get hold of objects in the exterior domain and to reconcile this with their awareness of the interior domain (they can see the objects). Such an effort provokes the use of a sign, which is then interpreted by the adult caregiver, or an older child, as a demand for explanation; the other responds in turn with an act of meaning. There has been “conversation” before; but this is a different kind of conversation, in which both parties are acting symbolically. A typical example from my own data would be the following, with the child at just under 0;6:

There is a sudden loud noise from pigeons scattering.

Child [lifts head, looks around, gives high-pitched squeak]

Mother: Yes, those are birds. Pigeons. Aren't they noisy! (LTL, p. 95)

Vygotsky makes essentially the same point about the coconstruction of meaningful signs in describing the emergence of what he calls the “indicatory gesture.” In the first stage, when failing to reach an object beyond arm's length, the child's hands “stop and hover in midair . . . Here we have a child's movements that do nothing more than objectively indicate an object.” However, when the mother comprehends the significance of the movement as an indicatory gesture, there is an essential change in the situation.

The indicatory gesture becomes a gesture for others. In response to the child's unsuccessful grasping movement, a response emerges not on the part of the object

but on the part of another human. Thus other people introduce the primary sense into this unsuccessful grasping movement. And only afterward, owing to the fact they have already connected the unsuccessful grasping movement with the whole objective situation, do children themselves begin to use the movement as an indication. (1981, pp. 160–61)

Despite differences between the two accounts in the extent to which the child's initial behavior is seen as symbolic, the features they have in common are very striking: The child is the initiator of the event; he or she draws on his or her existing resources to make an adaptive response (vocal or gestural) to some aspect of the environment; the adult interprets this response as intended communicatively and responds accordingly; in so doing, the adult constitutes the child's action as a sign—a symbolic action with communicative value.

A further feature that is brought out explicitly by Halliday's example is that, in responding, the mother both validates the communicative significance of the child's behavior as a sign, and also makes a further contribution to the meaning that is being co-constructed in the conversational sequence that the child's behavior has initiated. She thus not only models the dialogic nature of conversation as "exchange" but also provides evidence of how other relevant features of the situation—to which she judges the child is already attending—are encoded in the adult language.

The microgenetic significance of this "contingently responsive" behavior on the part of the adult participant can be seen very clearly in an example, involving a somewhat older child, taken from my own data (Wells, 1986, pp. 46–7).

Mark (2;3) is standing by a central heating radiator and can feel the heat coming from it. He initiates the conversation by sharing this interesting information with his mother.

- Mark: 'Ot, Mummy?
 Mother: Hot? (checking) Yes, that's the radiator.
 Mark: Been- burn?
 Mother: Burn? (checking)
 Mark: Yeh.
 Mother: Yes, you know it'll burn don't you?

A few minutes later Mark is looking out of the window, where he can see a man who is burning garden waste. Mother is now busy about housework.

- Mark: A man's fire, Mummy.
 Mother: Mm? (requesting a repetition)
 Mark: A man's fire.
 Mother: Mummy's flower? (checking)
 Mark: No . . . the man . fire
 Mother: Man's fire? (checking)

- Mark: Yeh.
 Mother: (coming to look) Oh, yes, the bonfire.
 Mark: (imitating) Bonfire.
 Mother: Mm.
 Mark: Bonfire . . .
 Oh, hot, Mummy, Oh, hot. It hot. It hot.
 Mother: Mm. It will burn, won't it?
 Mark: Yeh. Burn. It burn.

Several points can be made about this extract as an illustration of the way in which the co-construction of meaning in particular conversations provides the basis for the child's taking over of the adult language. First, it illustrates the way in which the conversations in which the young child participates are "functionally related to observable features of the situation around him" (Halliday, 1978, p. 18). This is for both Halliday and Vygotsky a necessary precondition for communication at this stage, when the gap between the participants is so great. It is also a necessary basis for the child to be able to "break into" the adult language. Second, as I have argued elsewhere (Wells, 1985, 1986), it is for this reason that it is important for the adult to ascertain the child's meaning intention, as Mark's mother does here, before extending the conversational exchange. When the child's interlocutor makes an incorrect interpretation, his or her extension of the assumed topic risks seriously confusing the child or, at best, bringing the conversation to a halt. However, when—as here—the adult is able to follow the child's lead and make contributions that are relevant to the child's focus of interest and attention, meanings that are initially co-constructed can be taken over by the child and brought to bear in new situations in which they apply. This can clearly be seen happening in Mark's observation that, like the radiator, the bonfire is "hot" and may "burn."

On this general issue of the interactional basis of language learning, Halliday and Vygotsky are, I believe, in close agreement. However, there are points on which they apparently differ. One of these concerns the origins of the child's language.

"Talking one's way in"

Vygotsky argues that there are two separate "roots" to what he calls "intellectual speech" (by which he may be taken to mean speech which is recognizably based on the adult language). Both a phylogenetic analysis of the behavior of anthropoids and an ontogenetic analysis of the behavior of human infants led Vygotsky to draw the following conclusions:

1. As we found in our analysis of the phylogenetic development of thinking and speech, we find that these two processes have different roots in ontogenesis.
2. Just as we can identify a "pre-speech" stage in the development of the child's

thinking, we can identify a “pre-intellectual stage” in the development of his speech.

3. Up to a certain point, speech and thinking develop along different lines and independently of one another.

4. At a certain point, the two lines cross: thinking becomes verbal and speech intellectual. (1987, p. 112)

Vygotsky fixes this point at about the age of two, following Stern, who describes it as the moment “when the child makes the greatest discovery of his life, that each thing has its name.” The reaching of this milestone is manifest in “the child’s sudden, active curiosity about words . . . and the resulting rapid, saccadic increases in his vocabulary” (1987, p. 82). Prior to this point, Vygotsky notes, the child does recognize a small number of words for objects, persons, actions, states, or desires, but these are words that have been supplied by other people. However, when he reaches this milestone,

. . . the situation changes; the child feels the need for words and, through his questions, actively tries to learn the signs attached to objects. He seems to have discovered the symbolic function of language. Speech, which in the earlier stage was affective–conative, now . . . enters the intellectual phase. (Vygotsky, 1987, p. 82)

On the surface, this account seems to be very different from the one proposed by Halliday, based on his very detailed study of Nigel (1975, LTL). Before considering the disparities, though, two points should be made about the account that Vygotsky offers. First, not having access to data that he had collected himself, Vygotsky was dependent on the published work of other scholars, such as Stern and Bühler. Second, his somewhat sketchy account of language development was written in the context of his study of the relationship between thinking and speech, including the development of inner speech, and so, to a degree, was influenced by his attempt to establish his position on this subject vis-a-vis those of Piaget and other scholars with whom he disagreed. For both these reasons, Vygotsky’s account should not be taken as a comprehensive theory of language development of the kind that Halliday provides.

This being said, there are still some major discrepancies that need to be considered. On closer inspection, though, it is not so much the “facts” that are in dispute as the interpretation that is put upon them. As numerous studies have now shown, it *is* the case that a recognizable milestone occurs at about the age of two and that, thereafter, the child’s speech becomes intelligible to people outside the immediate family. It is also the case that at about this age many children engage in the naming game concurrently with a rapid increase in vocabulary (Bruner, 1983). It is also true that prior to this point (whether it occurs at two, or somewhat earlier—or later), the child can successfully communicate with his or

her immediate family using stable forms that may be based on relevant adult words. What is more controversial, though, is Vygotsky's interpretation of these facts.

First, the separate roots of thought and speech. In the form in which Vygotsky makes this claim, many may find the distinction too schematic and symmetrical (Bates, 1976). However, it is interesting to see that in the two predispositions that Halliday sees as setting the stage for language development—interacting communicatively and interpreting experience—there is at least a suggestion of a distinction of the kind that Vygotsky proposes. In Vygotsky's scheme, however, the predisposition to interpret experience does not initially involve speech but is more akin to the chimpanzee's tool-like manipulation of objects. Only when both preintellectual speech and prespeech thinking have reached a relatively high level does language proper begin: "To "discover" speech, the child must think" (1987, p. 112). Halliday, on the other hand, has very little to say about the intellectual development of the child prior to the emergence of language, although he does state that "the child has the ability to process certain highly abstract types of cognitive relation which underlie (among other things) the linguistic system" (1978, p. 17). However, my interpretation of his few comments on this very early stage is that he considers both language and thinking to emerge out of what might be called "protosemiotic" systems of action and gesture. On this score, then, their views are certainly not identical, but neither are they categorically opposed.

The second and in my view more important, difference is in their characterization of the major milestone that occurs at around the age of two. Vygotsky's identification of the discovery that things have names as the chief characteristic of the breakthrough that occurs at this age is probably partly accounted for by the salience of this aspect of the child's concurrent speech behavior and by his relative ignorance of the earlier phases of language development, which have only become known since his time (Wertsch, 1985). But just as significant, I believe, is the fact that both in his analysis of inner speech and in his study of concept formation, it was word-meaning that he selected as the critical unit for making the bridge between thinking and speech.

For Halliday, on the other hand, it is the transformation of the child's protolanguage into the adult language that is the significant milestone and, as he explains in considerable detail (1975, LTL), this is dependent on the adoption of a tristratal system.

The [protolinguistic] system as a whole is now deconstructed, and reconstructed as a stratified semiotic: that is, with a **grammar** (or, better, since this concept includes vocabulary, a **lexicogrammar**) as intermediary between meaning and expression. The grammar interfaces with a semantics at one edge and with a phonetics, or phonology at the other. In other words, the protolanguage becomes a language, in the prototypical, adult sense. (LTL, p. 96)

These are certainly very different accounts, with Halliday's being both more detailed and more centrally concerned with explaining how the child constructs an "adult" language on the basis of the resources that had been developed in the preceding phases. And it is their views of the nature of these resources that constitute the third area of disagreement.

Halliday describes the construction of what he calls the protolanguage as very much the child's own invention. About the earliest phase, he observes that "there is no obvious source for the great majority of the child's [vocal] expressions, which appear simply as spontaneous creations of the glossogenic process" (1975, p. 24). Similarly, the meanings that these expressions encode are not derived from adult meanings. By contrast, Vygotsky, in the extract quoted above, seems to suggest that, prior to the two-year milestone, the child has not been actively involved in constructing a linguistic means of communicating, but is operating with "words that have been supplied by other people" (1987, p. 82).

Paradoxically, however, this marked disagreement stems from their different ways of developing what I believe to be very similar overall perspectives, which are related to their choice of a genetic explanation. In the discussion with Halliday referred to earlier, Parret asks what the study of one child's development has to offer to general linguistics. Halliday's answer is worth quoting at length.

To me there seem to be two aspects to be stressed here. One is: what is the *ontogenesis* of the system, in the initial stage before the child takes over the mother tongue? The other is: what are the strategies through which the child takes over the mother tongue and becomes linguistically adult? . . . We can postulate a very small set of uses, or functions, for which the child first creates a semiotic system. I have tried this out in relation to one subject, and you can see the child creating a meaning potential from his own vocal resources in which the meanings relate quite specifically to a certain set of functions which we presume to be general to all cultures. He learns for instance that language can be used in a regulatory function, to get people to do what he wants; and within the function he learns to express a small number of meanings, building up a system of content/expression pairs where the expression is derived entirely from his own resources. He creates a language, in functional terms. Then at a certain point he gives up this trail . . . [and] he switches and starts taking over the adult system. (1978, p. 53)

The critical phrase here is "functions which we presume to be general to all cultures" or, as he puts it a little earlier, "creating his own language on what is presumably a phylogenetic model." What Halliday seems to be suggesting is that the protolanguage emerges from the child's "natural" adaptation to, and interaction with, a social environment. With the child's switch to the adult language, on the other hand, we see both the influence of an already existing cultural tool on the phylogenetically "natural" protolanguage and the consequences for the child's ability to participate in social activity which result from the dramatic expansion of his meaning potential.

However, the transition is not made entirely on the child's initiative. For, as Halliday acknowledges:

the adult language does exert an influence on the child's semantic system from a very early stage, since the child's utterances are interpreted by those around him in terms of their own semantic systems. In other words, whatever the child means, the message that gets across is one which make sense and is translatable into the terms of the adult language. It is in this interpretation that the child's linguistic efforts are reinforced, and in this way the meanings that the child starts out with gradually come to be adapted to the meanings of the adult language. (1975, p. 24)

This, I would argue, is not very different from Vygotsky's more general account of the way in which participation in cultural practices leads to modification and transformation of the individual human's "natural" functions. In the earliest stage of interaction with others, Vygotsky states, contact is established through touching, cries, or gazes—forms of direct relation that are also found among anthropoids.

At a higher level of development, however, mediated relations among people emerge. The essential feature of these relations is the sign, which aids in establishing this social interaction. It goes without saying that the higher form of social interaction, mediated by the sign, grows from the natural forms of direct social interaction, yet is distinguished from it in an essential way. (1981, p. 160)

In the article from which it is taken, this passage is immediately followed by the account of the development of pointing as a sign, which was quoted at the beginning of this section. And, on that basis, Vygotsky goes on to draw the following conclusion: "We could therefore say that it is through others that we develop into ourselves . . . The individual develops into what he/she is through what he/she produces for others. This is the process of the formation of the individual" (1981, pp. 161–162). This is strikingly similar to Halliday's more specifically linguistic account of the development of "persons," which he represents in the diagram which is reproduced as Figure 1.

Thus, as I intimated earlier, the differences between Vygotsky and Halliday with respect to their views on language development turn out to be relatively insignificant when compared to the areas in which they are in very general agreement. Where they differ is in the rather general and schematic framework that Vygotsky sketches compared with the much more detailed account that Halliday provides of the specifically linguistic ontogenetic process.

This way of characterizing their respective contributions to a language-based theory of learning is even more true when we come to consider their accounts of how participation in conversation provides the means for taking over the more general semiotic resources of the culture, a process referred to interchangeably as "socialization" or "enculturation."

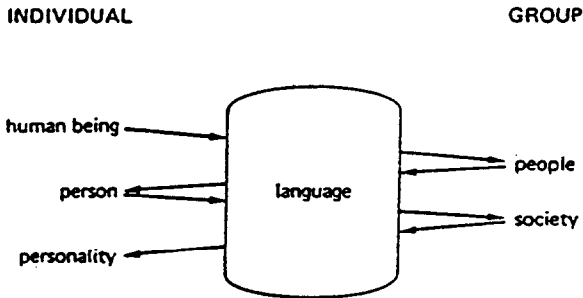


Figure 1. Learning language: Becoming a person (from Halliday, 1978, p. 15).

Appropriating the culture

Here, we might start with the sociocultural perspective, represented by a quotation from Leontiev, who was one of Vygotsky's colleagues and the foremost exponent of that aspect of Vygotsky's thinking that has come to be called "activity theory." As well as setting the scene for a discussion of enculturation, this quotation provides some useful background on the development of Vygotsky's ideas more generally.

The initial ideas that led Vygotsky to investigate the genesis of internal mental activity from external activity are fundamentally different from the theoretical approaches of other modern authors. These ideas came from his analysis of the features unique to human productive labor activity, which is mediated by tools. This activity is initially social in nature, that is, it is developed under the conditions of cooperation and social interaction among people. Vygotsky identified two main, interconnected features [of this activity] that are necessarily fundamental for psychology: its tool-like ("instrumental") structure, and its inclusion in a system of interrelations with other people. It is these features that define the nature of human psychological processes. The tool mediates activity and thus connects humans not only with the world of objects but also with other people. Because of this, humans' activity *assimilates the experience of humankind*. This means that humans' mental processes (their "higher psychological functions") acquire a structure necessarily tied to the sociohistorically formed means and methods transmitted to them by others in the process of cooperative labor and social interaction. But it is impossible to transmit the means and methods needed to carry out a process in any way other than an external form—in the form of an action or external speech. In other words, higher psychological processes unique to humans can be acquired only through interaction with others, that is, through *interpsychological* processes that only later will begin to be carried out independently by the individual. (Leontiev, 1981, pp. 55–56) (emphases in the original)

In the present context, it is the two underlined passages that are most germane to the argument (although, as we shall see below, the whole quotation is crucial

to an understanding of Vygotsky's contribution to a language-based theory of learning). Vygotsky's insight, Leontiev argues, was to recognize that it is in the intersychological processes of interaction in the context of [labor] activity that humans take over the experience of humankind, as this is encoded in the tools that are used, and particularly in the semiotic tool of external speech. Applied to the situation of the language learner, this might be restated as follows: By participating in the conversations that accompany and grow out of the everyday activities in which he or she is involved together with other members of the culture, the child learns to use the semiotic tool of language, which enables him or her to "connect" with other people; at the same time, and by virtue of the mediating role that conversation plays in these activities, the child simultaneously "assimilates the experience of humankind," as this is encoded in the semantic system of that culture's language.

Against this, let us set Halliday's account, as this is formulated in his general overview of "language and social man" (Halliday, 1978, p. 9).

In the development of the child as a social being, language has the central role. Language is the main channel through which the patterns of living are transmitted to him, through which he learns to act as a member of a 'society'—in and through the various social groups, the family, the neighbourhood, and so on—and to adopt its 'culture', its modes of thought and action, its beliefs and its values. This does not happen by instruction, at least not in the pre-school years; nobody teaches him the principles on which social groups are organized, or their systems of beliefs, nor would he understand it if they tried. It happens indirectly, through the accumulated experience of numerous small events, insignificant in themselves, in which his behaviour is guided and controlled, and in the course of which he contracts and develops personal relationships of all kinds. All this takes place through the medium of language.

And, from the same source:

The child learns his mother tongue in behavioural settings where the norms of the culture are acted out and enunciated for him, settings of parental control, instruction, personal interaction and the like; and, reciprocally, he is 'socialized' into the value systems and behaviour patterns of the culture through the use of language at the same time as he is learning it. (1978, p. 23)

In order to understand in more detail what it is about language that enables this reciprocal process to function so effectively, Halliday argues, we need to explicate the relationship between culture and text, where text is understood as both the process ("texting") and the product (text) of interaction in a specific setting. Since his proposals on this issue have already been reviewed above in the discussion of register and genre, it is not necessary to spell them out in detail here. However, it is worth considering why he believes that this aspect of his theory is of particular explanatory value in this respect.

As already noted, it is through participation in informal conversation in the context of everyday events and activities that the child's learning of and through language takes place, at least in the early years. In such settings, the meanings that are expressed relate to the events and activities that enact the social semiotic in ways that are perceptible and concrete; this is in marked contrast to settings involving more formal texts, such as literary works or lectures, where the relationship between text and social system is more complex and indirect. Informal conversation is thus much more accessible to interpretation by the child, since the various semiotic strategies and motifs that make it up are derivable from features of the social environment. But, by the same token, the features of the social environment, considered as instantiations of the social semiotic, are also derivable from the patterns of meaning and from the semantic strategies that are realized in the texts that are jointly constructed in conversation.

This is possible, Halliday suggests, because:

The linguistic system has evolved in social contexts, as (one form of) the expression of the social semiotic. We see this clearly in the organization of the semantic system, where the ideational component has evolved as the mode of reflection on the environment and the interpersonal component as the mode of action on the environment. The system is a meaning potential, which is actualized in the form of text; a text is an instance of social meaning in a particular context of situation. We shall therefore expect to find the situation embodied or enshrined in the text, not piecemeal, but in a way which reflects the systematic relation between the semantic structure and the social environment. (1978, p. 141)

It is precisely this relationship that is captured in the concept of register which, through the relationship of realization, maps situation-type, categorized in terms of field, tenor, and mode, onto the meaning potential, organized in terms of the three semantic metafunctions, ideational, interpersonal, and textual. Space does not permit me to include an illustration of Halliday's use of this concept to explain what he calls the "sociosemantics of language development," but an excellent example of his analysis of an extract of parent-child conversation in these terms is to be found in Chapter 6 of *Language as Social Semiotic* (Halliday, 1978); examples of language development in the school years analyzed in terms of genre are to be found in Christie (1989) and Rothery (1989).

In sum, it is abundantly clear that both Halliday and Vygotsky see the use of semiotic tools, and particularly language, as the means whereby, in the course of everyday activity and interaction, the culture is simultaneously enacted and socially "transmitted" to succeeding generations.

LANGUAGE AND INTELLECTUAL DEVELOPMENT

As has already been mentioned, Vygotsky's central preoccupation in his work as a psychologist was to construct an explanation of the development of what he

called the “higher mental functions.” From the outset, he assumed that such an explanation must be both historical and cultural: Fully formed adult mental activity is not simply the outcome of maturation and individual experience, it is also profoundly enriched and transformed by the “assimilation of the experience of humankind” through the individual’s engagement in social action and interaction, mediated by the use of semiotic tools.

During his brief career, Vygotsky’s attempts to develop a theoretical framework adequate to this task went through a number of stages during each of which he tended to tackle certain aspects of the framework without necessarily ensuring that he maintained consistency with respect to the whole (Minick, 1987, 1989). Nevertheless, there are two features that remain constant in all his work: First, his commitment to a “causal–genetic” analysis, and second, the central role that he assigned to speech in his explanatory efforts. Both are to the fore in *The Development of Higher Mental Functions* and *Thinking and Speech*, both of which are available in English translation (Vygotsky, 1930/1981 and 1934/1987, respectively).

In the former, Vygotsky’s sociocultural theory of the development of mind is set out in broad terms. It is here that we find his “general genetic law of cultural development”:

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. This is equally true with regard to voluntary attention, logical memory, the formation of concepts, and the development of volition. (1981, p. 163)

The connection between the two planes is found in the mediating function of signs and, in particular, of speech. Experienced first in interaction with others, the functions of speech are gradually internalized and become means for self-directed mental activity. “A sign is always originally a means used for social purposes, a means of influencing others, and only later becomes a means of influencing oneself” (1981, p. 157). This general principle was subsequently developed in more detail in *Thinking and Speech* (Vygotsky, 1987) through a number of investigations, both theoretical and empirical, into the relationship between social speech, inner speech, and thought.²

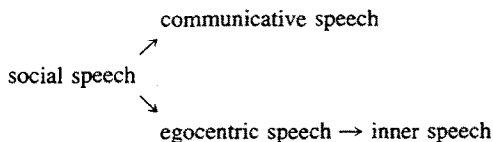
For Vygotsky, one of the most important prerequisites for progress in unraveling this relationship was the choice of an appropriate unit for the analysis of verbal thinking. This he found in “word meaning.” Initially, his choice of this unit was motivated by the fact that it captured the characteristics of verbal thinking as a whole rather than separating it into its separate components of speech and thinking. Word meaning, he argued, “belongs not only to the domain of thought but to the domain of speech” (1987, p. 47). However, by the time he embarked

on the introductory chapter to *Thinking and Speech*, he had come to recognize that to fulfill his overall goals, the analysis of the development of word meaning must be carried out, not only in connection with the development of individual verbal thinking but also in connection with the function of the word in communicative interaction (Minick, 1987). This is made clear in his statement that: "it may be appropriate to view word meaning not only as a *unity of thinking and speech* but as a *unity of generalization and social interaction, a unity of thinking and communication*" (1987, p. 49).

However, equally important was to explain how word meanings, encountered in interaction with others, come to function as tools for internal verbal thinking. Part of his solution to this problem was developed in his critique of Piaget's (1932) account of egocentric speech. According to Vygotsky, Piaget's thesis was that initially, the child's thought is autistic, uninfluenced by reality or the possibility that others might perceive the world differently. Development, according to Piaget, is towards rational or directed thinking, which is social and communicable. This progression is reflected in the child's speech. In early childhood, much of his speech, particularly in play, is egocentric, spoken to himself as if he were thinking aloud. In his social speech, on the other hand, he exchanges thoughts with others through requests, questions, and statements. However, as his thinking becomes progressively more socialized, so does his speech. By about the age of seven or eight, egocentric speech has almost disappeared; henceforth, his speech is almost entirely social.

While agreeing with the basic facts that Piaget reported, Vygotsky disagreed with his interpretation of them. Empirically, he had found that in the case of young children, "the coefficient of egocentric speech nearly doubled when some difficulty or impediment was included in the task." By contrast, school-age children, when faced with the same task, thought in silence and then found the solution. However, when they were asked what they had thought about, their answers "indicated a similarity between their covert behavior and the overt verbal thinking of the preschooler. Our assumption, then, is that the same operations that the preschooler carried out in overt speech are carried out by the school-age child in soundless, inner speech" (1987, p. 70).

On the basis of these results and of his own quite different interpretation of Piaget's data, Vygotsky then proposed an alternative developmental progression, based on the principle of "functional differentiation":



According to this view, the initial function of the child's speech is social—to interact with others. However, as the child develops, there is a differentiation of

function: Social speech becomes differentiated into egocentric speech and communicative speech. Then, as egocentric speech becomes further differentiated from communicative speech "through a gradual process of abbreviation," it ceases to be overt and is transformed into covert, inner speech. Egocentric speech is thus a transitional form that "develops in a social process that involves the transmission of social forms of behavior to the child. [It] develops through a movement of social forms of collaboration into the sphere of individual mental functions" (1987, p. 74)

This is not the place to go into Vygotsky's analysis of the characteristics of inner speech (for which, see Vygotsky, 1987, Chapter 7) except to say that, as the syntactic and phonetic aspects of external speech are reduced to a minimum, "word meaning advances to the forefront" (1987, p. 275). Thus, with the concept of inner speech, Vygotsky was able to establish the nature of the intramental domain of verbal thinking and, at the same time, both trace its developmental antecedents in external speech and suggest how intramental verbal thinking could continue to be influenced by the intermental thinking that occurs in social activity. Put very simply, "the characteristics of word meaning reflect the characteristics of the communicative activity in which it develops" (Minick, 1987, p. 28).

This brings us to the third aspect of Vygotsky's thinking during the final phase—his focus on "the social situation of development" (Vygotsky, 1987). It was in this context that he developed his concept of the "zone of proximal development," to account for the role of teaching in the child's learning. Much has been written in recent years about the significance of this concept by both developmental and educational researchers (e.g., Cole, 1985; Tharp & Gallimore, 1988; and chapters in Forman, Minick, & Stone, 1993; Moll, 1990; Rogoff & Wertsch, 1984), so I shall confine my comments to what seem to me to be the most salient features of Vygotsky's (1978, 1987) exposition for the theme of this article.

The first thing to note is that although Vygotsky enunciated the concept in relation to the assessment and instruction of school-age children, it is clear that he considered the principles on which it is based to be of very general relevance. Thus, in more recent work, it has been applied both to adult learning (Tharp & Gallimore, 1988; Wells, 1993a) and also to children's learning before the years of schooling (Rogoff & Wertsch, 1984). In fact, in his explanation of the concept of the ZPD (Vygotsky, 1978), he proposed that this form of assisted learning should be treated as a general developmental law:

We propose that an essential feature of learning is that it creates the zone of proximal development; that is, learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers. (1978, p. 90)

A significant feature of this formulation is that it makes clear that the zone of proximal development is not an attribute of the individual learner but rather a

potential for his or her intramental development that is created by the intermental interaction that occurs as the learner and other people cooperate in some activity. It is important to ask, therefore, what conditions must be met if this interaction is to enable the potential for development to be realized.

One criterion that Vygotsky emphasized was that it should take the form of assistance that enables the learner to achieve, in collaboration with another, what he or she is as yet unable to achieve alone. Hence Vygotsky's formula that "the only "good learning" is that which is in advance of development" (1978, p. 89). But not arbitrarily so, for the upper limits are set by the learner's current state of development and by his or her intellectual potential (1987, p. 209). A second criterion that Vygotsky emphasized was that the assistance should be relevant to the learner's own purposes. Taking the example of children learning to write, he argued that if the teaching is to be effective, the activity to which it is addressed should be perceived as meaningful, satisfying an intrinsic need in the learner and "incorporated into a task that is necessary and relevant for life" (1978, p. 118).

Taking these three aspects of Vygotsky's mature theorizing as a whole, we can see that as Bruner (1987) remarked in his Prologue to *Thinking and Speech*, it is, at one and the same time, a theory of development, of cultural transmission, and also of education. Furthermore, far from having been superseded by more recent developments, the framework that his theory provides is still proving productive for present day theorizing and research in all these fields.

Exactly the same could be said about Halliday's theory. One has only to look at the work of his colleagues and students to see that systemic linguistics has provided an extremely fruitful framework for work on language development (Painter, 1989), on cultural transmission (Hasan, 1986, 1992; Turner, 1973), and on the role of language in education (Christie, 1989, 1991; Lemke, 1988, 1990; Martin, 1993). It has also influenced the work of more distant scholars in all these fields—often in conjunction with ideas taken from Vygotsky and other sociocultural theorists.

With respect to their thinking about education, the closeness of fit between Halliday and Vygotsky is perhaps greatest in their views about the teaching of writing—as a comparison of Halliday's (1973) Foreword to the American edition of *Breakthrough to Literacy* and Vygotsky's (1978) chapter on "The prehistory of written language" would show. Not only do they both see learning to write as representing a much more abstract task for the child than learning to speak, as it involves a second-order symbolic system; but they also both emphasize the need to make the tasks through which it is learned meaningful and functionally relevant for the learner. Their views about the teacher's role are also remarkably similar. Indeed, Halliday's characterization of the optimal learning environment as "a milieu that is child-centered but in which the teacher functions as a guide, creating structure with the help of the students themselves" (1978, p. 210) could almost have been written by Vygotsky if he had been formulating his concept of the zone of proximal development in the register of contemporary pedagogy.

On the other hand, Halliday differs from Vygotsky in being unwilling to

theorize about thinking—at least, in so many words. However, this is consistent with his adoption of an interorganismic orientation in his approach to language; to enter into a discussion of thinking conceived of as internal activity would be to cross the divide and to enter the domain of the intraorganismic.

At first sight, therefore, his choice of terms to describe the initial distinction that the child makes in his transition to the adult, *tristratal*, language system is somewhat surprising.

The transition begins with an opposition between utterance as action (doing) and utterance as reflection (understanding) . . . This is transformed, in the course of the transition, into a combination whereby every utterance involves both choice of speech function (i.e. among different kinds of doing) and choice of content (i.e. among different realms of understanding). (LTL, p. 100)

On the face of it, this looks like a distinction, somewhat parallel to that between Vygotsky's communicative and egocentric functions, that will eventually become external (social) and inner speech. This interpretation receives further support when Halliday, explaining the metafunctional principle, characterizes the meaning of the mood system—part of the interpersonal system—as “what relationship am I setting up between myself and the listener?” and the meaning of the transitivity system—part of the ideational system—as “what aspect of experience am I representing?”

Does Halliday intend this apparent parallel? At one level, the answer is very definitely that he does not. Despite its mental overtones, the term “reflection” must be understood here in the sense of “linguistically constructing the content of experience” through the experiential systems that are part of what will ultimately become the “ideational” metafunction, and the contrasting “action” as “linguistically affecting the activity of coparticipants in the situation” through the systems that make up the interpersonal function. Rather, what is significant about the child's construction of the lexicogrammatical stratum and his entry into an “adult” language is that the functions of action and reflection are now *combined* in a single utterance. This is made clear in the conclusion to the passage quoted earlier: “But the more significant aspect of the metafunctional principle, for learning theory, is that in language (as distinct from protolanguage) it is the **combination of the experiential and the interpersonal** that constitutes an act of meaning. All meaning—and hence all learning—is at once both action and reflection” (LTL, p. 101).

In the protolanguage stage, utterances were monofunctional. Now, with the means that the adult language makes available, the child can both establish intersubjective agreement about what aspect of experience is being referred to (reflection) and simultaneously negotiate the stance that is to be taken to that experience (action).

In using the terms action and reflection then, Halliday is drawing attention to

the two major dimensions of meaning in linguistic interaction and proposing an explanation of how the child's linguistic system becomes able to handle these two dimensions simultaneously. In his use of these terms, no distinction is intended between communicating and thinking. Both are uses that are made of language in social life and, as he observes when questioned by Parret about Chomsky's definition of language as the "expression of thought," he finds it unhelpful to isolate either thinking or communicating as fundamental (1978, p. 50).

Nevertheless, Halliday is clearly not uninterested in thinking. Indeed, in glossing the interpretation of experience associated with the ideational metafunction, he refers to it as "thinking with language" (1985, p. xix). And in describing how the child constructs the semantic system in interaction with others, he makes it clear that he is also giving an account of how she or he appropriates the culture's most powerful semiotic tool for thinking with. In the last analysis, therefore, Halliday's theory of language is also a theory about reflecting on experience and achieving understanding, as these activities are carried out with the resources of language as a tool.

With the reconstituting of the grammar goes a reconstitution of reality as experience has to be reinterpreted in terms of the characteristic patterns of meaning that are used in written texts. As Halliday says, the apprenticeship into literacy requires that children master "a new form of knowledge: written, educational knowledge as against the spoken knowledge of common sense" (LTL, p. 109).

One of the characteristics of the way in which "written, educational knowledge" is represented is that it involves what Halliday calls "grammatical metaphor," in particular, the use of nominal structures to represent what, in the spoken mode, would be realized in a complete clause. Halliday (1988, 1990) has shown that this feature is particularly prevalent in the registers that have evolved in written scientific English, but it is now found in most other written registers and certainly in the texts used in social studies courses as Martin (1993) has demonstrated.³ However, the further reconstruction of the grammar necessary to handle the particular type of abstraction that grammatical metaphor involves does not develop until around the age of nine or ten. This is the third step in Halliday's proposed three-step model of semiotic development.

Underlying the different ways of construing experience that correspond to these three steps in grammatical development is a distinction that Halliday refers to as "synoptic/dynamic complementarity" (LTL, p. 112). Commonsense knowledge, as it is encoded in the spoken conversational texts of daily life, is dynamic in its organization: The meanings foregrounded are those of doings and happenings, which are realized lexicogrammatically in clauses that are "congruent," that is to say, where processes and attributes are realized as verbs and adjectives/adverbs. Educational knowledge, on the other hand, as it is encoded in written texts, is synoptic: The meanings foregrounded are those of structure and

stasis, realized lexicogrammatically in texts favoring grammatical metaphor. However, the synoptic and dynamic modes are complementary; each has evolved to serve different purposes in the totality of semiotic exchange. Furthermore, as Halliday emphasizes, "Any kind of phenomenon may be interpreted as some product of the two—once the adolescent has transcended the semiotic barrier between them" (1987, p. 21).

We can conclude, then, that the differences between Halliday and Vygotsky in their views on the relationship between language and thinking are not as great as might at first sight appear; rather, their ways of accounting for this relationship are the result of their different overall orientations to the mediating functions that language performs in human activity. Vygotsky, as a psychologist interested in intra-organismic activity, makes appeal to the constructs "concept" and "thought"; however, his tool for the analysis of concepts is "word-meaning" and much of what he has to say about thinking is couched in terms of "inner" speech. Halliday, as a linguist with sociological leanings, emphasizes linguistic behavior and the purposes it serves in social life. However, as he readily recognizes, one of the most important of these purposes is the construction and manipulation of knowledge; indeed, as he states in the opening section of LTL, "language is the essential condition of knowing, the process by which experience becomes knowledge" (p. 94).

LANGUAGE AND THINKING IN SCHOOL

In our comparison so far, we have been concerned mainly with the early years—the period when the child is engaged in constructing the language system through conversation with those in his or her immediate community and, in the process, taking over their theory of experience as this is encoded in the linguistic semiotic. But neither Vygotsky nor Halliday is content to leave the matter there. Sometime in middle childhood children in most cultures start going to school—the second of Bernstein's (1971) "critical socializing contexts"—and this initiates a new phase in their learning which involves new ways of using language and new ways of thinking.

In Chapter 6 of *Thinking and Speech*, Vygotsky addresses this transition in terms of the distinction between "everyday" and "scientific" concepts and their mutual influence on each other, arguing for the important role of instruction in helping students appropriate the latter means of thinking. It is in this context that he most clearly explains how instruction that is in advance of development "wakens a whole series of functions that are in a stage of maturation lying in the zone of proximal development" (1987, p. 212). However, since this is by far the longest chapter in the book, I can do no more than present a very schematic account of what I see to be the most important points for the purposes of this comparison.

First, it is important to clarify what Vygotsky means by "scientific" and

“everyday” concepts. By “scientific” he does not just mean concepts pertaining to the natural sciences; in fact, in his experimental research, he and his student, Shif, used material from a school social science program. Rather, “scientific” here means systematic and, for the most part, encountered in educational contexts. By contrast, “everyday” (or “spontaneous”) concepts are those that are constructed in the contexts of action and interaction in the varied and naturally occurring events of everyday living.

Vygotsky proposes that these two types of concept differ in a number of ways. But, of these, the most important is that while everyday concepts are based on direct, personal experience, involving conscious and deliberate action, the concepts themselves are not subject to conscious awareness or volitional control. Scientific concepts, by contrast, being encountered in the course of instruction and typically through verbal definitions and explanations constructed in collaboration with the teacher, require conscious awareness and deliberate application from the outset; on the other hand, they often have little contact with direct experience.

Nevertheless, the two types of concept are not unrelated. Until everyday concepts have reached a certain level in any field, it is not possible for the child to learn the related scientific concepts. Moreover, the learning of the latter influences the continued development of the former, bringing the everyday concepts into the domain of conscious awareness and volition. “The scientific concept grows downward through the everyday concept and the everyday concept moves upward through the scientific” (1987, p. 220).

To explain this development, Vygotsky invokes two processes: generalization and systematization. All concepts involve generalization, but the earliest type of generalization is simply that which is required for the classification of objects; no hierarchical relationships exist between the resulting concepts, he claims. At the next stage, vertical, taxonomic relationships between concepts are developed, a process which involves the generalization of the generalizations achieved in the preceding stage. The next stage is characterized by the development of concept equivalence—any concept can be represented through other concepts in indefinitely many ways. Combining these two dimensions—the vertical (degree of abstractness) and the horizontal (breadth of connections with other concepts)—Vygotsky proposes that each concept can be assigned a measure of generality. And, in functional terms, “the measure of generality determines the set of possible operations of thought available for a given concept” (1987, p. 228). In addition, as progress is made towards greater generality, concepts and the operations performed on them become increasingly independent of particular forms of verbal expression.

In general, everyday concepts are relatively low on this measure of generality, while scientific concepts are higher. However, the key to the difference between the two types of concept, Vygotsky claims, is a function of the presence or absence of a system. Everyday concepts are learned “unsystematically,” in the

sense that it is the structure of the activities in which the child spontaneously engages that determines what concepts he or she will develop. On the other hand, nonspontaneous scientific concepts, encountered in school, are presented and learned as part of a system of concepts which are related both horizontally and vertically. It is this that makes them conscious and deliberate from the outset. However, as systematization is introduced into the child's thinking through instruction in relation to scientific concepts, it leads to a restructuring of his or her spontaneous concepts, making them more systemic and bringing them under conscious control.

In summarizing the results of this research, Vygotsky emphasizes three points. First, although described schematically, the actual structure of a child's concepts is much more complex and uneven. Word meaning is always a generalization, but the generality of meaning of each word continues to develop as it enters into structural relationships with other words. Second, the mode and character of thinking depends on the structure of generality of the concepts that are being operated on. As these develop, so do the types of thinking that are possible. Third, teaching plays a crucial role in this process, not only in school but also in the preschool stage. However, although the concept of the zone of proximal development applies to all teaching, the relationship between teaching and learning is different at different stages, with teaching in school being characterized by an emphasis on scientific concepts, that is to say, concepts that capture relationships between other concepts and that are most readily realized through linguistic formulations.

In LTL, Halliday provides what is essentially a parallel account of intellectual—or semiotic—development. But whereas Vygotsky's account is couched in terms of the development of word meaning, Halliday's is based on progressive reconstructions of the grammar as a whole, each of which involves a new way of construing experience. Although the development of word meanings is certainly part of this process, it is the child's meaning potential as a whole that is reconstituted at each step as new experiences of language in use lead to developments in what the child can do with language.

The first reconstruction—and the most far-reaching in terms of its social semiotic consequences—occurs when the child reconstructs his protolanguage as a meaning potential organized in terms of three strata, with a lexicogrammar functioning as intermediary between semantic content and phonological expression. As Halliday explains: "The grammar opens the way to naming and reference, and hence can function as a theory of human experience" (LTL, p. 97). Equally significantly, as a result of this reconstruction, the child's "theory of experience" can be influenced by the cultural theory that is encoded in the adult contributions to the conversations in which they construct meanings together.

At this stage, the child's symbols become "conventional" (in the sense of the relationship between meaning and phonological expression being arbitrary) and words (lexical items) become names of classes of objects, attributes, actions, and

so on, as it is only class-names that can enter into grammatical constructions. Like Vygotsky, Halliday sees classification as generalization, though he also sees the latter as involving the development of taxonomically based systems: "Words are learnt not as in a dictionary but as in a thesaurus, each one being progressively located, in the expanding topological space, by reference to the "others" to which it is taxonomically related" (LTL, p. 99).

Furthermore, with the adoption of the adults' linguistic semiotic system, a number of strategies for expanding the meaning potential become available. Of these, undoubtedly the most powerful is the ability to give and ask for information, where this is interpreted as "imparting meanings that are not already shared by the person addressed." "Now for the first time learning becomes a two-way semiotic process, based on the reciprocity of learning and teaching. And just as children are predisposed to learn, so parents and other "others" are predisposed to teach" (LTL, p. 102). However, this teaching is spontaneous, arising, for the most part, out of the need for the establishment and maintenance of intersubjective agreement about the way in which the situations in which they are engaged should be interpreted. Furthermore, the theory of experience that the child constructs on this basis is not all of a piece. As Halliday points out, "the common-sense grammars of daily life . . . embody complementarities of many kinds, contradictory interpretations of some aspect of experience, each of which illuminates one facet of it—such that the whole is construed in terms of the tension between them" (LTL, p. 108).

The transition to school and the demands of literacy bring about the next reconstruction. Halliday characterizes it in terms of "abstraction"—movement from the concrete to the abstract. Because of the more abstract nature of written language, both with respect to its use of a second-order symbolism and with respect to its tendency to make use of words that refer to abstract entities (i.e., "other wordings"), in learning to read and write, children have to reconstitute their meaning potential in a new, more abstract mode. A further important consequence is that, in the process, they begin to become aware of language itself as a semiotic tool that has its own structure and organization. This metalinguistic awareness is what Olson (in press) sees as the major cognitive consequence of learning to write.

Finally, like Vygotsky, he considers that teachers have an essential role to play in helping children to reconstruct their grammars to cope with the abstractions involved in the use of grammatical metaphor and to recognize and exploit the synoptic/dynamic complementarity. In fact, I believe that it is when we recognize the importance of the teaching function performed by the child's interlocutor more generally, in helping him or her to communicate meanings of personal importance in the terms of more "adult" grammar, that we discover the reason why "the magic gateways" through which children make the transitions to successive steps in the developmental trajectory are most strongly associated with the interpersonal metafunction (LTL, p. 103).

Once again, comparing the accounts of school learning that Halliday and Vygotsky propose, we find that there is a large degree of similarity between them, including their use of many of the same terms to refer to more or less identical phenomena. And, even when the terms are different—everyday/scientific concepts as opposed to commonsense/educated knowledge—it is clear that it is very much the same kind of distinction that is being drawn in each case. However, it is also illuminating to look at the ways in which the two accounts differ. I should like to consider two.

Different Conceptions of the Demands of Schooling

Both Vygotsky and Halliday recognize that schooling is very much concerned with the development and reconstruction of meaning. However, they differ in the ways in which they analyze meaning and, in particular, in their choice of units of analysis. Whereas Vygotsky focuses almost exclusively on word meanings as the locus of conceptual development, for Halliday the minimum unit of analysis is a text, that is to say, an instance of language being used in discourse. In his account, meaning is made in the constructing and interpreting of texts, and this involves the interplay of different components of meaning—interpersonal, textual, and logical, as well as experiential.

This broader view of meaning has two consequences. First, it allows us to see more clearly that development in the functions of thinking that are possible for the child depends as much on the relationships that are made between word meanings within the text as on the structures of generality of the word meanings considered in isolation. In other words, the development of verbally mediated thinking depends on the stage reached in the development of the grammar as a whole. Second, when the act of meaning is seen as involving both (interpersonal) action and (ideational) understanding, as is always the case in the thinking that is embodied in discourse, there is no need to seek outside the communicative situation for the motivation that engenders thinking. This is something of which Vygotsky seems to have been intuitively aware when he wrote, in the final chapter of *Thinking and Speech*, “Thought has its origins in the motivating sphere of consciousness, a sphere that includes our inclinations and needs, our interests and impulses, and our affect and emotion” (1987, p. 282). By focusing on the way in which the full resources of the lexicogrammar enable all these aspects of consciousness to be integrated in the meaning construction that is required in the production of an *external* text, Halliday provides a strong clue as to how these same resources may be drawn on in the thinking of inner speech.

The second difference is in the feature of schooling that is proposed as the spur to the development of what Vygotsky calls the higher mental functions. For Halliday, it is essentially the demands of coping with written language and its synoptic mode of meaning. For Vygotsky, it is the systemic nature of scientific concepts and their basis in school instruction. However, if we look at the underlying features of the two explanations, we find that they have much in common.

Halliday characterizes written language in terms of its relative abstractness and its tendency to project a synoptic perspective onto reality. Vygotsky notes the greater degree of generality (i.e., abstraction) that characterizes scientific concepts and the fact that their relationships to objects are mediated through relationships with other concepts. For Vygotsky, the strength of the scientific concept lies in its promotion of the higher characteristics of conscious awareness and volition. For Halliday, written language encourages the development of metalinguistic awareness and children's monitoring and direction of their own learning processes. Nevertheless, they are in agreement in seeing the systematization of meaning as a central feature of this stage of development.

Interestingly, the first part of Vygotsky's chapter on the development of scientific concepts contains an analysis of learning the written language that stresses the abstract, conscious, and volitional nature of the processes involved and identifies them as "the features that distinguish all the higher mental functions that develop during this period" under the influence of instruction (1987, p. 213). Although there is no mention of written language in the later part of the chapter, where the analysis of the development of scientific concepts is made in terms of their level of generality and systemic relatedness, it could be argued that the construction of scientific concepts is just one particular aspect of the "reconstruction" of both language and experience that is involved in learning to read and write. If this is so, as I have argued elsewhere (Chang-Wells & Wells, 1993), the congruence of the two accounts of the development of language-based thinking is even greater than at first sight appears.

Where does this leave the additional developmental step in Halliday's account which is associated with the reconstruction of the grammar in terms of grammatical metaphor? First, it should be stated that with the development of the concept of grammatical metaphor, Halliday has made a major contribution to our understanding of the way in which the structure of written text influences the possibilities for using language as a semiotic tool. It also makes explicit the nature of one of the major difficulties with which students have to grapple as they begin to encounter texts written from the perspective of the disciplines that underpin the subjects of the secondary school curriculum.⁴

Vygotsky's research extended only to the equivalent of the end of the elementary stage of education, and so it is impossible to say whether a continuation into the secondary stage, or the more differentiated, discipline-based analysis of scientific concepts foreshadowed at the conclusion of Chapter 6 of *Thinking and Speech*, would have led him to propose a further stage of conceptual development corresponding to this feature of written language. However, it is clear that the social studies texts from which he selected the materials for his research with Shif contained this feature of discipline-based written language, for nominals such as "exploitation" and "revolution" are among the small number of cited examples of scientific concepts. It is, therefore, tempting to surmise that Vygotsky's failure to recognize the relationship between this feature of the struc-

ture of written text and the “higher” forms of verbal thought was due to his greater attention to inner as opposed to outer discourse and, in particular, to his choice of word meaning as the unit of analysis. However, setting this last difference aside for the moment, it is clear that the two accounts are, overall, very similar; where they differ, the differences reflect complementary rather than contradictory perspectives.

THE COMPLEMENTARY NATURE OF THE TWO THEORIES

I hope that by now it will be evident that the theories of language and learning developed by Halliday and Vygotsky are essentially compatible. This is in large part because they both subscribe to the following assumptions:

1. In order to understand any form of human behavior, it is necessary to adopt a genetic approach.
2. Both phylogenetically and ontogenetically, development is dependent on the availability of tools; in this respect, semiotic tools are of particular importance.
3. Language is a particularly powerful semiotic tool because its semantic structure:
 - encodes the culture’s theory of experience, including the knowledge associated with the use of all other tools;
 - enables its users to interact with each other in order to coordinate their activity and simultaneously to reflect on and share their interpretations of experience.
4. In ontogenesis, development is raised to new levels by the appropriation of the tools created by previous generations. In particular, in learning their mother tongue through situationally based conversation, children also appropriate the knowledge and practices of their culture.

No doubt this list could be extended, but it will serve as a summary of much of the preceding discussion. It will also serve as a background against which the differences between them can be evaluated before going on to consider some of the ways in which treating their perspectives as complementary may lead us to a more comprehensive language-based theory of learning.

Perhaps the most significant difference—and the one that accounts for most of the others—is in the content of their research. Halliday is a linguist and Vygotsky, a psychologist. It is not surprising, therefore, that the former should study texts and the latter mental activity. Nor is it surprising that although both have a strong interest in the functions of language, Halliday studies these functions as they are realized in external speech and writing, while Vygotsky tends to

be more interested in the ways in which language influences mental functions and in the way it functions in inner speech.

However, the choice of orientation with respect to the phenomena of language—whether external or internal—does not necessarily imply a corresponding choice of either the social or the individual as the frame of reference for interpreting the phenomena. Although Halliday deliberately and explicitly adopts an “interorganismic” orientation, this does not mean that his social perspective is adopted at the expense of the individual. As his account of language development makes clear, and as Figure 1 (p. 57 above) illustrates, Halliday’s conception of the relationship between the individual and the social group, in relation to which he or she simultaneously becomes a member and a person, is very similar to Vygotsky’s conception of this relationship.

It is for this reason, I would argue, that we can treat these two orientations as complementary—as Halliday himself suggests (1978, 1984)—and thereby arrive at a richer interpretation of phenomena which both have studied, each from his own theoretical perspective. In the remaining sections of this article, therefore, I shall look at four areas in which I believe there is much to be gained by adopting this strategy.

THE EDUCATIONAL CONSEQUENCES OF SOCIOSEMANTIC VARIATION

The first area in which the complementary perspectives of Halliday and Vygotsky may combine to give a more complete account is that of enculturation and the consequences of growing up in different sociocultural milieux.

Vygotsky raises this issue most explicitly in relation to Piaget’s account of intellectual development which, he argues, is seriously flawed because Piaget neglected the impact that differences in sociocultural experience may have on children’s development. The developmental uniformities established by Piaget, he points out, “are not the eternal laws of nature but historical and social laws . . . Whether the child speaks egocentrically or socially depends not only on his age but on the conditions in which he finds himself” (1987, p. 90).

However, in this context, Piaget is only a stalking horse that Vygotsky uses in order to make a more general point. Thought development, he argues, is not simply an individual process, but is contingent on the child’s mastering the social means of thought through linguistic interaction with others; furthermore, children’s experience of language in use varies as a result of cultural differences in the activities in which they are permitted to participate. It follows, therefore, that studying the development of the child’s thinking in different social environments, especially environments where children work, “will create a potential for establishing laws relevant not only to the *here and now* but to the development of the child generally” (1987, p. 91).

More generally, in his writings on this issue, Vygotsky was concerned to

establish two very important principles. The first was that the intellectual development of the individual cannot be understood without taking into account his or her interactions with other people in his or her social environment; as he puts it, "the levels of generalization in [the thinking of] a child correspond strictly to the levels in the development of social interaction" (Vygotsky, 1956, p. 432; quoted in Wertsch, 1983, p. 26). And the second was that this social environment is itself influenced by the wider culture which varies according to the forms and organization of labor activity that are practiced and the material and semiotic tools that are employed.

Unfortunately, Vygotsky did not himself have time to carry out empirical investigations to substantiate the second of these principles in relation to children's intellectual development, and the study of adult thinking carried out in Central Asia, in which Luria and his colleagues attempted to test the connection between cognition and socially organized modes of interaction (Luria, 1976), had serious methodological limitations (Cole, 1985). More recently, however, there have been renewed attempts to test Vygotsky's ideas through cross-cultural research, and corroborating evidence has been obtained for the two principles, particularly with respect to the cognitive effects of schooled literacy (Bruner & Greenfield, 1972; Scribner & Cole, 1981).

For Halliday, on the other hand, the relationship between the social structure and language behavior has been an abiding concern. Indeed, much of his effort has been directed towards explaining how language has come to be as it is "because of the functions it has evolved to serve in people's lives" (1978, p. 4). Furthermore, his views on the effects on intellectual development of social and cultural differences in linguistic experience are in very general agreement with those of Vygotsky. As he says, "it is not difficult to suppose an intimate connection between language on the one hand and modes of thought and behaviour on the other" (1978, p. 25). However, in exploring this issue he has built on ideas derived from sociology and anthropology rather than from cross-cultural psychology, and he has pursued it with respect to differences *within* rather than between cultures, concentrating, in particular, on the role of language in the relationship between social class and educational achievement.

Here, as he is the first to acknowledge, Halliday has been strongly influenced by the work of Basil Bernstein, who was his colleague at the University of London at the time he was leading the Linguistics and English Teaching Programme. What interested Halliday in Bernstein's work was the latter's attempt to explain the relationship between social class and differential educational achievement, not in terms of genetic inheritance, but in terms of the cultural transmission of educational inequality "through linguistic codes, or fashions of speaking, which arise as a consequence of the social structure and the types of social relationship associated with it" (Halliday, 1978, p. 25).

Emphasizing that it is not particular words or sentence structures, and still less

pronunciation or accent, that Bernstein is referring to, Halliday explains the connection as follows:

The 'fashions of speaking' are sociosemantic in nature; they are patterns of meaning that emerge more or less strongly, in particular contexts, especially those relating to the socialization of the child in the family. Hence, although each child's language-learning environment is unique, he also shares certain common features with other children of a similar social background; not merely in the superficial sense that the material environments may well be alike—in fact they may not—but in the deeper sense that the forms of social relation and the role systems surrounding him have their effects on the kind of choices in meaning which will be highlighted and given prominence in different types of situation.⁵ (1978, pp. 25–26)

Here, it seems to me, Halliday is providing an account, in sociolinguistic terms, of precisely the sorts of differences in sociocultural experience that Vygotsky considered to be critical in relation to intellectual development. What is more, he sees these experiences of linguistically mediated social interaction as constitutive of development in very much the same way as Vygotsky does—as the continuation of the above quotation makes clear:

This dependence on social structure is not merely unavoidable, it is essential to the child's development; he can develop only as *social* man, and therefore his experience must be shaped in ways which make him a member of society and his particular section of it. (1978, p. 26)

When Halliday's theoretical description of sociosemantic variation is taken in conjunction with the evidence from Hasan's (1986, 1992; Hasan & Cloran, 1990) empirical investigations based on Bernstein's theory of socialization, the result is a powerful account of the way in which certain key features of the social structure are enacted and "transmitted" through the everyday conversations experienced by children from different social classes. On the other hand, as we might expect, Halliday has little to say about the specifically intraorganismic consequences of this sociosemantic variation.

As pointed out above, Halliday's concern is with the role of language in the formation of *social man*; his interest is in language as the prototypical form of *social* semiotic and, in particular, in the way in which the semantic system of language both finds its realization in the lexicogrammar and itself realizes the larger behavioral systems which constitute the social semiotic. Vygotsky, by contrast, was concerned with the development of consciousness and the semiotically mediated mental phenomena of which it is constituted. Although emphasizing the origins of language in social action, both phylogenetically and ontogenetically, his own research concentrated on the transformation of the child's mental, that is to say internal, functioning that occurs when social or

external language is internalized to become a more powerful means of mediating intellectual activity.

Far from being in conflict, however, I believe these two orientations are complementary in the account they offer of the educational consequences of growing up in different cultural or subcultural environments. The explanation of intellectual development that Vygotsky offers, in terms of the internalization of the modes of discourse that mediate social action and interaction, is a major part of such an account. However, as Wertsch (1989) observes, it is far from complete. For, in concentrating almost exclusively on dyadic social interaction, Vygotsky failed to explain how the discursive means that are internalized to mediate mental functioning are themselves influenced by sociocultural factors such as class, ethnicity, and gender. By contrast, it is just this part of the overall account that is found in Halliday's theoretical description of sociosemantic variation as it impacts on educational achievement.

Putting these two theoretical contributions together, therefore, we might propose the following account: Children's ability to engage effectively in the different tasks that they may be expected to undertake in school depends on the extent to which they have internalized the sociosemantic functions of the specific modes of discourse that mediate these tasks, both intermentally and intramentally; and this depends on the extent to which these functions have been highlighted in their interactions with the significant others in their immediate family environments which, in turn, varies according to the family's relationship to the larger social structure. In particular, it varies according to ethnic and social class membership.

Clearly, a key factor in the working out of the relationship between socio-cultural background and school achievement is the nature of the activities in which children are expected to engage in school. In principle, there is no reason why school tasks should not be selected such that they validate and build on the sociosemantic functions that individual children have already mastered, while systematically introducing those that are as yet undeveloped. This would certainly be in keeping with Vygotsky's conception of learning and teaching in the zone of proximal development (Tharp & Gallimore, 1988). However, in practice, the tasks and modes of discourse that tend to be privileged are precisely those that are least familiar to nonmainstream children; as a result, a situation is created in which these children become educationally disadvantaged.

Whether the modes of discourse that are privileged are really of inherently greater intellectual value is a matter of current debate (Lemke, 1988). However, as Halliday points out,

... as things are, certain ways of organizing experience through language, and of participating and interacting with things, are necessary to success in school. The child who is not predisposed to this type of verbal exploration in this type of experiential and interpersonal context 'is not at home in the educational context', as Bernstein puts it. Whether a child is so predisposed or not turns out not to be any

innate property of the child as an individual, an inherent limitation on his mental powers, as used to be generally assumed; it is merely the result of a mismatch between his own symbolic orders of meaning and those of the school, a mismatch that results from the different patterns of socialization that characterize different sections of society, or subcultures, and which are in turn a function of the underlying social relations in the family and elsewhere. (1978, p. 26)

ENCULTURATION: CULTURAL REPRODUCTION OR INDIVIDUAL EMPOWERMENT?

It might be objected, however, that this theory of language-mediated enculturation, as just outlined, is heavily weighted towards the cultural determination of individual development. Indeed, a criticism that has sometimes been leveled against the work of both Halliday and Vygotsky—or at least against some of the uses that are being made of their work in education—is that it emphasizes cultural reproduction at the expense of cultural change, and conformity at the expense of individual creativity (Dixon, 1987; Engeström, 1991; Hatano, 1993; Sawyer & Watson, 1987). In order to evaluate this charge, we must look briefly at the ways in which the possibility of change is envisaged in the writings of the two theorists.

As might be expected, Halliday deals with cultural change through the relationship between the cultural semiotic and the particular texts that are constructed in relation to it. The social system is not static, he argues, for it is being constantly recreated in the social encounters in which it is instantiated, and these are themselves dynamic. This can be seen most clearly by looking at the discourse processes through which texts are created. As these proceed in real time, “the meaning of the text is fed back into the situation, and becomes part of it, changing it in the process; it is also fed back, through the register, into the semantic system, which it likewise affects and modifies” (1978, p. 126).

It is within this general account that we can best understand the permeability of the situation described in the previous section. There, I characterized Halliday’s interpretation of the sociolinguistic codes proposed by Bernstein as involving a variation in semantic style, or meaning orientation, that is associated with the positions that different individuals and their families occupy in the social structure. However, since all conversations are dynamic, encounters involving interactions between users and uses of these different codes have the potential of bringing about change through feedback, both in the meaning orientations of the speakers and in their role relationships vis-a-vis the members of their families and other social groups.

Thus, in the course of growing up, the young child is involved in encounters with people occupying various positions in the social structure; these include encounters through reading and television viewing, as well as face-to-face encounters with family members, teachers, and other people in the wider commu-

nity. As a result, the meaning potential that each child constructs, and the "personality" that she or he develops, is the unique outcome of the particular interactions in which she or he has participated. Nevertheless, the degree to which these encounters extend or modify the meaning orientation initially developed within the individual child's family depends on further factors having to do with the conditions under which later encounters take place, notably the way in which she or he is welcomed into—or made to feel excluded from—the social groups to which her or his interlocutors belong.

However, the child is never simply a passive recipient of the ways of speaking that he or she encounters but is continually constructing from them a personal meaning potential and a related perspective on experience. At every stage in his or her development, therefore—in childhood and beyond—each individual has unique contributions to make to the interactions in which he or she participates and an opportunity thereby to contribute to the modification of the social structure. For, as Halliday emphasizes, it is by individual acts of meaning in the situations in which those interactions occur, that the "social reality is created, maintained in good order, and continuously shaped and modified" (1978, p. 139). In keeping with his chosen perspective, therefore, Halliday's explanation of the possibility—indeed the inevitability—of change is inter-organismic, based in the dynamics of interaction and his conception of social man.

Vygotsky's explanation also gives a central role to language and other semiotic tools but, rather than being either inter- or intra-organismic, it is focused on the relationship between the two. In this way, it offers a psychological interpretation of the more sociologically oriented account that Halliday proposes. Briefly, Vygotsky's argument is that in appropriating the resources of the culture through participation in social action and interaction, the individual both transforms those resources and is transformed in the process.

The first step in his argument is included, almost as an afterthought, in his exposition of the genetic law of cultural development, quoted above (p. 60). Having asserted the primacy of the *intermental* plane in the development of any mental function, Vygotsky continues as follows: "but it goes without saying that internalization transforms the process itself and changes its structure and function" (1981, p. 163).

Although this statement is not much further developed in the article in question, Vygotsky's seminal remark about the constructive and creative nature of the transformations that take place in the internalization of mental processes has begun to receive sustained attention in more recent work in the sociocultural tradition (Engeström, 1991; Gal'perin, 1969; Wertsch & Stone, 1985). As these writers emphasize, following Vygotsky, internalization does not involve a simple copying of an external intermental process but rather an internal construction of the corresponding process which builds upon and is shaped by what the child can already do and understand. This gives rise to the first type of transformation—a

modification of the child's own mental processes, that changes the ways in which he or she perceives, interprets, and organizes the world (Nikolopoulou, 1991).

However, since the prior experience on which this construction is based is inevitably different, both between individual children and from one generation to the next, the resulting constructions also differ, giving rise to transformations of the process itself. The potential significance of this can be seen in the final phase of the internalization cycle, when, in the course of further social activity, the individual externalizes the process that he or she has appropriated in behavior which is novel in the situation and which, as a result, may transform the way in which the situation is understood by other members of the culture.

For both Halliday and Vygotsky, therefore, creativity and change are inherent characteristics of all action and interaction, resulting, over time, in the transformation of the resources of the individual participants and of the sociocultural practices in relation to which they occur. As already described, the facets of this complex process of cultural and individual transformation that they have each explored are essentially complementary. By combining them, I believe, we can construct a more comprehensive explanation of cultural change and individual creativity which shows how the two are related. This might be briefly stated as follows.

As Halliday suggests, the impetus for change is to be found in the social semiotic world, in tensions of various kinds, either within the system itself, or in relation to encounters involving individuals that arise in the course of everyday situations. An individual who is faced with a problem that he or she cannot manage alone is a particular case of such a tension. In one form or another, these tensions are resolved—at least partially—in the dynamics of social action and interaction which involve the use of language and possibly other mediating tools as well; in some cases, the resolution may also result in modification of, or addition to, the culture's available repertoire of mediating tools. Furthermore, from the perspective of the individual, participation in such collaborative action and interaction provides the opportunity for him or her to appropriate the processes involved, which, when internalized and integrated with their existing resources, as Vygotsky explains, transforms the way in which they tackle similar problems in the future. However, since internalization always involves a construction based on the individual's existing resources, the process that is internalized may itself be transformed, leading to subsequent innovatory forms of externalization in contexts of social action and interaction which, in turn, may introduce change into the semiotic system.

This can be illustrated on a small scale by an incident that was observed in a class of eight and nine-year-olds, in which the children were engaged in a science unit on the topic of time (Wells & Chang-Wells, 1992). In preparation for an activity in which the goal was to invent a method of measuring the time it took for each child to empty a bottle of water, the teacher talked with the small group

of children involved about the importance of making sure that their experiment was conducted as “a fair test.” Later, when on their own, each child filled her bottle to the brim and then, while she emptied the contents into a basin, the others clapped rhythmically and counted the claps. Lily, who went first, took four claps; Veronica and Emily tied, taking three claps each. At this point, Emily, who had assumed the role of group leader, paused for a moment’s reflection.

E: I know, me and Veronica are tied.
Do you know why you were slow? (to Lily)

When Lily does not answer,⁶ she puts the question to Veronica as well.

E: What we did— . What we did was we did a method by timing
Now, d’you guys think it was a fair match?

V: Yeh

E: Do you? (doubtfully)

A few minutes later, having entered their results in their science logs, Emily returns to the problem.

E: I want to ask you some questions before we do something
Why do you think it was a fair match?

V: Cos the bottles were filled to the exact same amount
Because exactly the same—

E: Yeh, like we counted EXACTLY . . .
Now, why do you think she lost? (referring to Lily)

In this example of problem solving, the cultural artifact that the teacher made available in the interaction that preceded the experiment was the principle of “a fair test” and the relevant practices in which it might be operationalized in the bottle-emptying activity. However, in appropriating this principle, Emily obviously built on her experience of fairness in more competitive situations and constructed the principle in a different form from that intended by the teacher. This was then externalized in her questions to the group, which characterized the experiment as a “match,” in which the fact that Lily “lost” cast doubt on whether it was “fair” or not. Despite considerable further class discussion about the importance of conducting experiments as fair tests, Emily continued to interpret this principle in terms of competition, and when she and her friends came to design and build their own timing device, she persuaded them to make two identical water clocks so that as well as making sure their experiment constituted a fair test, they could also have races with them.

Change, creativity, and diversification are thus of the essence of interaction, both between and within groups and individuals, as is clearly brought out by the genetic method of analysis. Whether these qualities are encouraged—or, alter-

natively, suppressed—depends on value judgments made by those with greater power in the social system. However, as Lemke (1990) argues, these, too, are open to negotiation and change.

THE INTELLECTUAL CONSEQUENCES OF LANGUAGE-BASED LEARNING IN SCHOOL

A third area in which I believe the combining of the different perspectives provided by Halliday and Vygotsky can offer a more comprehensive account is in relation to the linguistic and cognitive benefits of schooling. Their individual accounts were considered comparatively in an earlier section of this article. An interpretation which combines them might look something like the following.

When children come to school, they have already made considerable progress in constructing a practical theory of experience, based on commonsense knowledge. This they have achieved, simultaneously with learning their mother tongue, from taking part in the activity and discourse of everyday life in and around their homes, in which that knowledge is encoded in the texts that they co-construct with significant others. The specific content of this theory, including beliefs about the goals of action and interaction and about the particular semiotic resources that are appropriately recruited in their achievement, varies from child to child, depending on each child's unique experience, as this is mediated by the roles that he or she is called on to play by virtue of membership of a particular culture, ethnic group, social class, and gender. Furthermore, although children's behavior, both verbal and nonverbal, is for the most part fluent and purposeful, they are not yet consciously aware of the means they use to achieve their goals. In particular, although they use language as a means for understanding and reflecting on their experience, they cannot yet make language itself, or the meanings that it encodes, the subject of deliberate attention and manipulation.

However, in the first few years of schooling, an important transformation takes place, engendered largely by the experience of learning to read and write and of using this language mode as a tool for the achievement of a wide variety of tasks. Written language requires a considerable degree of abstraction, both of the written expression from the spoken and of the monologic process from the dialogic. This abstraction draws children's attention to the medium of language itself and also to the meanings that it encodes, thereby bringing both into the domain of conscious awareness and volition.

Through engaging with written texts in relation to the topics that they study in school, therefore, children gradually reconstitute their lexicogrammar in the more abstract written mode; at the same time, they reinterpret their experience according to the semantic structures that are characteristic of these written texts. Furthermore, as the content of the curriculum becomes more text-based, they begin to encounter new meanings that are more abstract and systemic in nature than those encountered in everyday speech. Thus, in learning to reconstrue

experience in terms of the semantic structures of written language, children construct what Vygotsky refers to as “scientific concepts.” That is to say, it is written texts—and the talk about them—that provide the discursive means for the development of the “higher mental functions,” through the appropriation of the systematically related concepts that correspond to the more abstract semantic structures found in written texts.

One particular characteristic of the written texts in which discipline-based, school knowledge is presented is the prevalence of grammatical metaphor in the lexicogrammatical realization of meaning. In contrast to the dynamic interpretation of experience in terms of actions and processes that is characteristic of common-sense knowledge and everyday speech, grammatical metaphor foregrounds the synoptic interpretation of reality, which objectifies experience by encoding processes and relations in structures organized around nouns. To understand and use this mode of written language requires a further reconstruction of the grammar; however, once mastered, this written, “scientific” mode of construing experience provides a powerful complementary mode to that which is characteristic of spontaneous everyday speech.

The reorganization of the grammar and the concomitant reconstrual of experience that is required in order to use written text as a tool for thinking and communicating does not occur spontaneously for most children. In order to master this new mode, children need to perceive it as functional for them in relation to activities that they find both challenging and personally meaningful. They also need to be given guidance and assistance in carrying out those parts of these activities that they are unable to manage on their own. This is most likely to occur when activities are carried out in situations of collaboration with the teacher or other children, in which the new, synoptic mode of construing experience is related to the more familiar, dynamic mode through talk that moves back and forth between the two modes, building bridges between them (Wells, 1993c).

Exactly what activities and classroom conditions are most likely to provide the necessary guidance and assistance is a question that is currently being investigated in a considerable number of classroom-based studies, many of which are inspired by one or other of the theorists whose work has been considered here. However, my belief is that such studies might have even more to gain by adopting a perspective that takes both theories into account.

It is with this in mind that in the final section I wish briefly to consider the claims about learning to mean that Halliday makes in the stimulating but highly condensed article to which this is an already rather lengthy response.

ACTION, SPEECH AND THOUGHT

In the opening paragraph of LTL, Halliday states that “the distinctive characteristic of human learning is that it is a process of making meaning—a semiotic process.” And, in the sense that all learning contributes to the individual’s ability

to participate in activities that take their meaning from the part they play in the lives of the sociocultural groups to which the individual belongs or aspires, this claim is undoubtedly correct. In this sense, one might agree that even learning to swim (to use Halliday's own example) is semiotic, although the physical skills that are involved can, in principle, be mastered in the absence of interaction with other human beings and are functionally equivalent to those that are part of the repertoire of mammals that are not, like humans, "quintessentially creatures who mean" (LTL, abstract).

However, the consequence of conflating all human behavior under the single rubric of "meaning" is that one loses sight of some important distinctions that need to be made in developing a language-based theory of learning. Halliday is obviously aware of this for, in the opening chapter of the 1978 collection, he clearly distinguishes "meaning" from "doing" and "saying."

Language is being regarded as the encoding of a 'behavioral potential' into a 'meaning potential'; that is, as a means of expressing what the human organism 'can do', in interaction with other human organisms, by turning it into what he 'can mean'. What he can mean (the semantic system) is, in turn, encoded into what he 'can say' the lexicogrammatical system, or grammar and vocabulary). (1987, p. 21)

In this definition, Halliday draws a clear distinction between doing and meaning, while seeing them both as forms of semiotic behavior, more generally conceived. Maintaining this distinction, therefore, it seems to follow that, although one can talk (i.e., can mean) about what one is doing, did, or might do, the actual "doing"—although a form of semiotic behavior—is not itself "meaning," except in the case of "doing in language."

What I am arguing then, is that, on the one hand, there are serious ambiguities in Halliday's use of the term "meaning" from one occasion to another, and that, on the other, in conflating the learning of all semiotic systems under the umbrella phrase "learning to mean," as he seems to do in LTL, he fails to distinguish the different roles that language plays in the development of "social man."

However, there is, in my view, a further reason for objecting to treating all doing as "meaning," in the sense in which "meaning" is defined in the above quotation. That is that this formulation fails to recognize the tool-like function of language in the achievement of the goals of semiotic activity more broadly conceived. In Vygotsky's terms, meaning linguistically is only one—albeit the most important—form of semiotic mediation, and to understand its significance on particular occasions, one must look at the goals of the activity it mediates. To recall Leontiev's argument (quoted above, p. 57), "The tool mediates activity and thus connects humans not only with the world of objects but also with other people." In sociocultural theory, as this quotation makes clear, language is certainly a powerful and versatile tool. However, it is the activity that it mediates that has conceptual and historical primacy; for it is through action and activities that we are related both to each other and to the external world (Minick, 1987).

As set out in LTL, where the emphasis is on language learning and learning through language through the successive reorganizations of the grammar, together with the progressive reconstruing of experience that these entail, Halliday's language-based theory of learning goes a long way towards explaining how language functions to connect humans with objects and with other people. However, it has very little to say about the wide range of activities in relation to which it performs this mediating role or about the specific functions of planning, directing, interpreting, and so on, through which this role is enacted. Here, it seems to me, the extension of Vygotsky's initial insights about semiotic mediation in more recent work on the theory of activity (Leontiev, 1978, 1981; Engeström, 1991) can provide an important complementary perspective.

On the other hand, it is important to reiterate the reciprocal nature of the complementarity I have sought to demonstrate. In suggesting that Halliday's sociolinguistic perspective will benefit from being articulated with activity theory, therefore, I wish to make clear that I equally believe that activity theory will benefit from the inclusion of Halliday's well-developed theory of language as social semiotic. As Minick (1987) points out, although Vygotsky was intellectually convinced of the importance of developing greater understanding of interpersonal and social discourse, neither he nor his colleagues and followers have pursued this program to any great extent. It is here, I believe, that Halliday has a particularly important contribution to make.

If we now combine the two perspectives, we might propose the following specification for a theory of learning: A comprehensive language-based theory of learning should not only explain how language is learned and how cultural knowledge is learned through language. It should also show how this knowledge arises out of collaborative practical and intellectual activities and, in turn, mediates the actions and operations by means of which these activities are carried out, in the light of the conditions and exigencies that obtain in particular situations. Furthermore, such a theory should explain how change, both individual development and social and cultural change, occurs through the individual's linguistically mediated internalization and subsequent externalization of the goals and processes of action and interaction in the course of these activities.

If we now apply this more comprehensive theory to education, we might characterize school learning rather more broadly than Halliday does in LTL. Certainly, learning is a semiotic process for which the prototypical resource is language. But it involves learning to do as well as to mean—to expand one's potential for meaningful action as well as one's potential for meaning through language. Discourse, both spoken and written, plays an essential, mediating role in these processes, as do other semiotic tools. However, the object of all this learning is not just the development of the learner's meaning potential, conceived as the construction and linguistic articulation of discipline-based knowledge, but the development of the resources for acting, speaking, and thinking that enable the learner to participate effectively and creatively in further practical, social, and intellectual activity.

Such a theory of learning also has implications for the recommendations we might wish to make for the kinds of classroom activity through which these resources can be developed. However, in order to go beyond current practice in ways that are pedagogically feasible as well as theoretically desirable, such recommendations will need to be derived from further research. And this must not only be based on this language-based theory of learning but—equally importantly—carried out in collaboration with teachers in relation to issues arising from the particular historical and cultural conditions in which they work.

Finally, in order to maximize the value of such research, we must consider the ways in which we analyze the data obtained in situations of learning and teaching. Earlier, it was suggested that word meaning, the unit of analysis chosen by Vygotsky in his studies of verbal thought, severely constrained the range of meanings that were taken into account in his ontogenetic analyses. From the review presented here, it seems clear that the use of Halliday's systemic, functionally oriented theory of grammar as meaning potential could significantly enrich further studies that investigate the development of ways of communicating and thinking that occur under different classroom conditions.⁷ However, classroom learning involves more than verbal thought; more, too, than spoken and written discourse. In order adequately to analyze the full range of roles that language plays in relation to the activities that take place in the classroom, we need to articulate Halliday's theory of linguistic meaning with a theory of activity and to use the resulting theoretical framework to devise categories suitable for both ontogenetic and microgenetic analyses of naturalistic observational data recorded in classrooms serving a wide variety of cultural communities (Lemke, 1990; Wells, 1993b, in press).

CODA

As is already widely recognized, both Halliday and Vygotsky have each from their own disciplinary perspectives made very significant contributions to our understanding of children's learning of and through language. My purpose in comparing these contributions has been to show that not only are they compatible but, because of their authors' different orientations towards language and learning, they are also in important ways complementary. This being so, I believe that by articulating their individual contributions, we can make considerable progress towards the construction of a more comprehensive language-based theory of learning. In offering my own brief sketches of what certain aspects of this theory might look like, my intention is to open the discussion and to engage other people in this collaborative endeavor.

REFERENCES

- Bakhtin, M.M. (1986). *Speech genres and other late essays* (Trans. Y. McGee). Austin, TX: University of Texas Press.
- Bates, E. (1976). *Language and cognition: The acquisition of pragmatics*. New York: Academic.

- Bernstein, B. (1971). *Class, codes and control I: Theoretical studies towards a sociology of language*. London: Routledge & Kegan Paul.
- Bruner, J.S. (1983). *Child's talk*. New York: Norton.
- Bruner, J.S. (1987). Prologue. In R.W. Rieber & A.S. Carton (Eds.), *The collected works of L.S. Vygotsky. Vol. 1 Problems of general psychology* (including the volume *Thinking and Speech*.) New York: Plenum.
- Bruner, J.S., & Greenfield, P.M. (1972). Culture and cognitive growth. In J.S. Bruner (Ed.), *The relevance of education*. London: Allen and Unwin.
- Chang-Wells, G.L., & Wells, G. (1993). The dynamics of discourse. In E. Forman, N. Minick, & A. Stone (Eds.), *Contexts for learning: Sociocultural dynamics in children's development*. New York: Oxford University Press.
- Christie, F. (1989). Language development in education. In R. Hasan & J.R. Martin (Eds.), *Language development: Learning language, learning culture. Meaning and choice in language: Studies for Michael Halliday*. Norwood, NJ: Ablex.
- Christie, F. (1991). Pedagogical and content registers in a writing lesson. *Linguistics and Education*, 3, 203–224.
- Cole, M. (1985). The zone of proximal development: Where culture and cognition create each other. In J.V. Wertsch (Ed.), *Culture, communication and cognition: Vygotskian perspectives*. New York: Oxford University Press.
- Cole, M. (in press). A conception of culture for a communication theory of mind. In D. Vocate (Ed.), *Intrapersonal communication: Different voices, different minds*. Hillsdale, NJ: Erlbaum.
- Dixon, J. (1987). In I. Reid (Ed.), *The place of genre in learning: Current debates*. Geelong, Vic: Deakin University, Centre for Studies in Literary Education.
- Engeström, Y. (1991). Activity theory and individual and social transformation. *Activity Theory*, 7/8, 6–17.
- Forman, E., Minick, N., & Stone, A. (1993). (Eds.). *Contexts for learning: Sociocultural dynamics in children's development*. New York: Oxford University Press.
- Gal'perin, P.Y. (1969). Stages in the development of mental acts. In M. Cole & I. Maltzman (Eds.), *A handbook of contemporary Soviet psychology*. New York: Basic Books.
- Halliday, M.A.K. (1973). Foreword. In D. Mackay, B. Thompson, & P. Schaub (Eds.), *Breakthrough to literacy* (American ed.). Glendale, CA: Bowmar.
- Halliday, M.A.K. (1975). *Learning how to mean*. London: Arnold.
- Halliday, M.A.K. (1978). *Language as social semiotic: The social interpretation of language and meaning*. London: Arnold.
- Halliday, M.A.K. (1984). Language as code and language as behaviour: A systemic functional interpretation of the nature and ontogenesis of language. In R. Fawcett, M.A.K. Halliday, S.M. Lamb, & A. Makkai (Eds.), *The semiotics of culture and language Vol. 1*. London: Frances Pinter.
- Halliday, M.A.K. (1985). *An introduction to functional grammar*. London: Arnold.
- Halliday, M.A.K. (1988). On the language of physical science. In M. Ghadessy (Ed.), *Registers of written English: Situational factors and linguistic features*. London: Pinter (Open Linguistics Series).
- Halliday, M.A.K. (1990). Some grammatical problems in scientific English. *Australian Review of Applied Linguistics, Series S. 6*, 13–37.
- Halliday, M.A.K., & Hasan, R. (1985). *Language, context and text: Aspects of language in a social-semiotic perspective*. Geelong, Vic: Deakin University. (Republished by Oxford University Press, 1989).
- Hasan, R. (1985). The structure of a text. In M.A.K. Halliday & R. Hasan (Eds.), *Language, context and text*.
- Hasan, R. (1986). The ontogenesis of ideology: An interpretation of mother-child talk. In T. Threadgold, E.A. Grosz, G. Kress, & M.A.K. Halliday (Eds.), *Semiotics, ideology and language*. Sydney: Sydney Association for Studies in Society and Culture.

- Hasan, R. (1989). The structure of a text. In M.A.K. Halliday & R. Hasan (Eds.), *Language, context, and text*. Geelong, Victoria: Deakin University Press. (Original work published 1985)
- Hasan, R. (1992). Meaning in sociolinguistic theory. In K. Bolton & H. Kwok (Eds.), *Sociolinguistics today: International perspectives*. London: Routledge.
- Hasan, R., & Cloran, C. (1990). A sociolinguistic interpretation of everyday talk between mothers and children. In M.A.K. Halliday, J. Gibbons, & H. Nicholas (Eds.), *Learning, keeping, and using language, Vol. 1*. Amsterdam: John Benjamins.
- Hasan, R., & Martin, J.R. (Eds.). (1989). *Language development: Learning language, learning culture. Meaning and choice in language: Studies for Michael Halliday*. Norwood, NJ: Ablex.
- Hatano, G. (1993). Time to merge Vygotskian and constructivist conceptions of knowledge acquisition. In E. Forman, N. Minick, & A. Stone (Eds.), *Contexts for learning: Sociocultural dynamics in children's development*. New York: Oxford University Press.
- Lemke, J.L. (1988). Disclosures in conflict: Heteroglossia and text semantics. In J.D. Benson & W.S. Greaves (Eds.), *Systemic functional approaches to discourse* (pp. 29–50). Norwood, NJ: Ablex.
- Lemke, J.L. (1988). Text structure and text semantics. In R. Veltman & E. Steiner (Eds.), *Pragmatics, discourse, and text* (pp. 158–170). London: Pinter.
- Lemke, J.L. (1988c). Genres, semantics and classroom education. *Linguistics and Education, 1*, 81–99.
- Lemke, J.L. (1989). Social semiotics: A new model for literacy education. In D. Bloome (Ed.), *Classrooms and literacy* (pp. 289–309). Norwood, NJ: Ablex.
- Lemke, J.L. (1990). *Talking science: Language, learning and values*. Norwood, NJ: Ablex.
- Leontiev, A.N. (1978). *Activity, consciousness, and personality*. Englewood Cliffs, NJ: Prentice-Hall.
- Leontiev, A.N. (1981). The problem of activity in psychology. In J.V. Wertsch (Ed.), *The concept of activity in Soviet Psychology*. Armonk, NY: Sharpe.
- Martin, J.R. (1992). *English texts*. Amsterdam: John Benjamins.
- Martin, J.R. (1993). Genre and literacy: Modelling context in educational linguistics. Sydney: University of Sydney, unpublished paper.
- Martin, J.R., Christie, F., & Rothery, J. (1987). Social processes in education: A reply to Sawyer and Watson. In I. Reid (Ed.), *The place of genre in learning: Current debates*. Geelong, Vic: Deakin University, Center for Studies in Literary Education.
- Mehan, H. (1979). *Learning lessons: Social organization in the classroom*. Cambridge, MA: Harvard University Press.
- Minick, N. (1987). The development of Vygotsky's thought: An introduction. In R.W. Rieber & A.S. Carton (Eds.), *The collected works of L.S. Vygotsky. Vol. 1 Problems of general psychology* (including the volume *Thinking and Speech*.) New York: Plenum.
- Minick, N. (1989). Mind and activity in Vygotsky's work: An expanded frame of reference. *Cultural Dynamics, 2*, 162–187. (Special ed. on "Sociocultural approaches to mind").
- Moll, L. (Ed.). (1990). *Vygotsky and education: Instructional implications and applications of sociohistorical psychology*. New York: Cambridge University Press.
- Nikolopoulou, A. (1991). E-mail message, XLCHC, Jan. 1, 1991.
- Olson, D. (in press). *The world on paper*. Cambridge, England: Cambridge University Press.
- Painter, C. (1989). Learning language: A functional view of language development. In R. Hasan & J.R. Martin (Eds.), *Language development: Learning language, learning culture. Meaning and choice in language: Studies for Michael Halliday*. Norwood, NJ: Ablex.
- Parret, H. (1974). *Discussing language*. The Hague: Mouton. Reprinted in M.A.K. Halliday (1978).
- Piaget, J. (1932). *The language and thought of the child*. London: Routledge.
- Rogoff, B., & Wertsch, J.V. (Eds.). (1984). *Children's learning in the "zone of proximal development"*. San Francisco: Jossey-Bass.

- Rothery, J. (1989). Learning about language. In R. Hasan & J.R. Martin (Eds.), *Language development: Learning language, learning culture. Meaning and choice in language: Studies for Michael Halliday*. Norwood, NJ: Ablex.
- Sawyer & Watson (1987). In I. Reid (Ed.), *The place of genre in learning: Current debates*. Geelong, Vic: Deakin University, Centre for Studies in Literacy Education.
- Scribner, S., & Cole, M. (1981). *The psychology of literacy*. Cambridge, MA: Harvard University Press.
- Sinclair, J.McH., & Coulthard, M. (1975). *Towards an analysis of discourse: The English used by teachers and pupils*. London: Oxford University Press.
- Tharp, R., & Gallimore, R. (1988). *Rousing minds to life*. New York: Cambridge University Press.
- Turner, G.J. (1973). Social class and children's language of control at age five and age seven. In B. Bernstein (Ed.), *Class, codes and control II: Applied studies towards a sociology of language*. London: Routledge & Kegan Paul.
- Vygotsky, L.S. (1934/1987). Thinking and speech. In R.W. Rieber & A.S. Carton (Eds.), *The collected works of L.S. Vygotsky, Volume 1: Problems of general psychology*, (Trans. N. Minick). New York: Plenum.
- 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*. Armonk, NY: Sharpe.
- Vygotsky, L.S., & Luria, A.R. (1930). *Etyudy po istorii povedeniya: Obez' yana, primitiv, rebenok*. [Essays in the history of behavior: Ape, primitive, child.] Moscow and Leningrad: Gosudarstvennoe Izdatel'stvo.
- Wells, G. (1985). *Language development in the pre-school years*. Cambridge, England: Cambridge University Press.
- Wells, G. (1986). *The meaning makers: Children learning language and using language to learn*. Portsmouth, NH: Heinemann Educational Books.
- Wells, G. (1993a). Working with a teacher in the zone of proximal development: Action research on the learning and teaching of science. *Journal of the Society for Accelerative Learning and Teaching*, 18, 127–222.
- Wells, G. (1993b). Reevaluating the IRF sequence: A proposal for the articulation of theories of activity and discourse for the analysis of teaching and learning in the classroom. *Linguistics and Education*, 5, 1–38.
- Wells, G. (1993c). *Text, talk and inquiry: Schooling as semiotic apprenticeship*. Paper presented at the International Language in Education Conference, Hong Kong, Dec. 15–17, 1993.
- Wells, G. (in press). From guessing to predicting: Progressive discourse in the learning and teaching of science. *Infancia y Aprendizaje* (Special ed. on classroom discourse).
- Wells, G., & Chang-Wells, G.L. (1992). What have you learned?: Co-constructing the meaning of time. Unpublished paper. Toronto: OISE, Joint Centre for Teacher Development.
- Wertsch, J.V. (1985). *Vygotsky and the social formation of mind*. Cambridge, MA: Harvard University Press.
- Wertsch, J.V. (1989). A sociocultural approach to mind: Some theoretical considerations. *Cultural Dynamics*, 2, 140–161.
- Wertsch, J.V., & Stone, A. (1985). The concept of internalization in Vygotsky's account of the genesis of higher mental functions. In J.V. Wertsch (Ed.), *Culture, communication and cognition: Vygotskian perspectives*. New York: Oxford University Press.
- Wertsch, J.V., & Tulviste, P. (1992). L.S. Vygotsky and contemporary developmental psychology. *Developmental Psychology*, 28, pp. 548–557.

Endnotes

1. In this context, it is interesting to note, as Martin (1993) does, the similarity of this Hallidayan framework to the perspective proposed by Bakhtin, who was one of Vygotsky's contemporaries. Substituting the term "text" for "utterance" throughout, Martin quotes the following extract:

All the diverse areas of human activity involve the use of language. Quite understandably, the nature of forms of this use are just as diverse as are the areas of human activity . . . Language is realised in the form of individual concrete texts (oral and written) by participants in the various areas of human activity. The texts reflect the specific conditions and goals of each such area not only through their content (thematic) and linguistic style, that is the selection of the lexical, phraseological, and grammatical resources of the language, but above all through their compositional structure. All three of these aspects—thematic content, style, and compositional structure—are inseparably linked to the *whole* of the text and are equally determined by the specific nature of the particular sphere of communication. Each separate text is individual, of course, but each sphere in which language is used develops its own *relatively stable types* of these texts. These we may call *speech genres*. (Bakhtin, 1986, p. 60. Quoted in Martin, 1993, p. 2)

2. As Minick (1987) makes clear in his translator's introduction, the chapters that make up this monograph were written at different times between 1929 and 1934, and, therefore, although the monograph as a whole was one of his last completed works, its separate chapters belong to more than one stage in the development of Vygotsky's thinking on the relationship between speech and thinking.

3. A comprehensive description of grammatical metaphor, as it occurs in the realization of interpersonal as well as ideational meanings, is to be found in *An Introduction to Functional Grammar* (Halliday, 1985).

4. The following is an example from a secondary school history text about the Chinese revolution, together with one possible alternative more characteristic of speech, that I have adapted from Martin (1993).

Written

This most successful phase of the Long March owes a great deal to the diplomatic skills of Zhou Enlai and to the bravery of the rearguard.

Spoken

[Zhou Enlai was able to negotiate skillfully with Chen Jitang (1)] and [the soldiers {who were left to guard the rear (3)} were very brave (2)], so [the Red Army successfully escaped (4)]. (p. 10)

In the "spoken" version, there are four clauses, numbered 1–4 (clause 3 is a relative clause defining which soldiers were brave). In the written version, the (approximate) meaning of each of these clauses is realized by the following correspondingly numbered nominal structures: (1) "the diplomatic **skills** of Zhou Enlai"; (2) "the **bravery** of the rearguard"; (3) "of the **rearguard**"; (4) "This most successful **phase** of the Long March." The only verb in the written clause does not realize a process at all but, in conjunction

with a further nominal structure—“a great **deal**”—is the metaphorical realization of the logical connector “so” in the “spoken” version.

5. Halliday discusses Bernstein’s theory of sociolinguistic codes in considerable detail in ‘Sociological Aspects of Semantic Change,’ which is included as Chapter 3 of *Language as Social Semiotic* (1978).

6. Lily has fairly recently arrived in Toronto from China, and does yet speak much English.

7. Wertsch (1985) makes a similar point, noting that “the complex relationship between grammatical specification and higher mental functions still awaits thorough investigation” (p. 139).