

# **Private speech: A cognitive tool in verbal communication**

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## **Abstract**

This paper introduces the psycholinguistic phenomenon of private speech (i.e., self-directed speech) in verbal communication. It describes the theoretical roots of research interests in this speech in the works of, and disagreement between, Piaget and Vygotsky, and summarizes details from some studies (including some in L2 research) that discuss the use of this speech in various settings from a Vygotskian perspective. The paper also analyzes data from conversations involving native and non-native speakers of English to show how the use of private speech introduces features of self-dialogs in the mind of an individual within the context of dialogs between individuals in task-based activities. Implications for L2 research, in terms of Vygotskian perspective, are mentioned in conclusion.

## **1. INTRODUCTION**

The purpose of this paper is to draw attention to an important psycholinguistic phenomenon in verbal communication that has gained considerable importance in recent years in research on cognitive development and provides useful implications for second language (L2) research. I will begin with a simple example from my professional experience in teaching English to non-native speakers (NNS). While developing a measurement for oral fluency in an English language class, a native speaker (NS) of English was asked to look at a picture and describe it in as much detail as possible in one minute. Her speech was then transcribed, the number of words (focusing on correct and incorrect instances of verbs) counted, and a native speaker (NS) norm established in terms of the amount of the selected features of speech. Later, the same task was given to non-native speakers (NNS) of English taking English language courses. Their levels of fluency were measured in terms of how close their speech came to the NS'. Not surprisingly, there was considerable individual variability; many NNS did not speak much, and hence seen as lacking fluency. On the other hand, interestingly, the instructors felt the amount of speech produced by the NS seemed surprisingly high. It seemed she talked too fast and too much.

A closer look at her transcription revealed something interesting. There were very few moments of silence. She had indeed spoken throughout the task activity, seemingly filling in every second of the time she had at her disposal. However, in her speech, there were numerous instances of such expressions as "What's this?"/ "Uuh .... it looks like ...." / "No, I don't think ...."/ "OK .... next .... let me see..."/ "OK ... I got it....," and so on. It was clear from these expressions that at several moments while doing the task she was not describing the picture but thinking aloud. In other words, she was trying to comprehend the picture for herself by talking aloud. She was talking to herself.

On the other hand, by comparison, in the speech of some NNS there were moments of silence, and then utterances that focused on picture description. It seemed these speakers tried to comprehend the picture silently, and then when they spoke they consciously focused on describing the picture. In short, we could say that while the NS planned and described loudly, some NNS planned their speech silently and then described loudly. It was difficult to say who exhibited control, or lack of it thereof, of the picture description task.

This is a classic, though oversimplified, example of "private speech" in verbal communication, a term first used by Flavell in 1966 (quoted in Diaz and Berk 1992:20). This kind of speech is "typically defined, in contrast to social speech, as speech addressed to the self (not to others) for the purpose of self-regulation (rather than communication)" (Diaz 1992:62). In other words, when an individual uses private speech in verbal communication, s/he is not talking to another individual but trying to control her/his own self in that the speech helps to mentally process task demands. For a researcher, this type of speech provides clues to such mental operations as focusing attention, planning, monitoring, self-motivation, pacing motor activity, etc., while performing specific tasks.

Private speech has become a widely discussed psycholinguistic topic in empirical literature on cognitive development (Zivin 1979; Diaz & Berk 1992). Most of the empirical studies focus on children in various age groups, ranging from 14 months to 8 years. These age groups (beginning with the appearance of linguistic ability among toddlers to the emergence of cognitive skills for logical problem solving in elementary level schooling) provide the basis for investigating cognitive development in their formative years. However, such speech also exists in older age, although not so frequently as among children. It has been an immensely important field of investigation for cognitive behavioral therapists concerned with problems of mental health among old people. Some researchers have also argued that private speech continues to be used even among adolescents and adults. In short, private speech is considered an important means of cognitive control of the self, the use of which occurs more often in childhood but continues throughout one's life.

The discussion in this paper is threefold. First, it provides a quick overview of the theoretical roots of the current research interest in private speech. Second, it summarizes some important details of the use of this speech among adults. Finally, some examples from a larger pool of data on NS-NNS conversations in English are presented and analyzed, the objective being to show that conversational dialogs are not necessarily one-on-one communication between two individuals but contain elements of self-dialogs as well because of the use of private speech during the conversations.

## 2. THEORETICAL ROOTS

The roots lie in the works of Piaget and Vygotsky, contemporaneous scholars early this century<sup>1</sup>. Both were developmental psychologists interested in the origins and processes of cognitive development. Both were interested in the children's use of the speech to self, a phenomenon that they agreed on. However, they disagreed sharply on the role this kind of speech (private speech) played in one's cognitive development. In fact, the term "private" speech is essentially a Vygotskian point of view; Piaget called it "egocentric" speech. Their different approaches to this phenomenon (i.e., speech to self) highlighted their fundamental differences about how human cognitive development proceeds.

Piaget (1923/1962) observed the activities of three to eight year old kindergarten children and discovered such instances of speech as verbal repetitions of another individual, monologues (i.e., verbal soliloquy) during an activity, and non-reciprocal remarks in collective settings. In these instances, their speech was not directed towards other individuals. In Piaget's mind, it showed evidence of egocentrism, a sign of cognitive immaturity, an inability to share the perspective of another individual. However, he argued, as the children grow old they increasingly socialize with others and their speech becomes communicative. Their speech moves away from being self- to other-oriented, a sign that they are able to adopt the perspectives of others. Around the age of seven or eight, a child overcomes egocentrism by beginning to think critically and logically, and egocentric speech fades away.

In short, according to Piaget cognitive development proceeds from being individual and self-centered to social and other-directed. As he put it: "...from the genetic point of view, we must start from the child's activity ... this activity is unquestionably egocentric and egotistical. The social instinct is late in developing. The first critical stage occurs at the age of seven or eight, and it is precisely at this age that we can place the first period of reflection and logical unification..." (Piaget 1969:209).

Vygotsky (1934/1986), on the other hand, believed that cognitive development proceeds from being social to individual. In other words, a child's cognitive development originates in socialization activities (e.g., mother-child interactions) and then goes through a process of increasing individuation. To quote him (Vygotsky 1986):

The earliest speech of child is ... essentially social. At first it is global and multifunctional; later its functions become differentiated. At a certain age the social speech of the child is quite sharply divided into egocentric speech and communicative speech.....Egocentric speech, splintered off from general social speech, in time leads to inner speech, which serves both autistic and logical thinking.

He argued that the phenomenon of self-directed speech did not show any cognitive immaturity but some form of development. Private speech (i.e., self-directed speech) represents a functional differentiation in the speech of a child. In other words, the child begins to differentiate between speech that is directed towards the others and speech that is self-

directed. The latter assumes important cognitive functions, such as, planning, monitoring, and guiding oneself while engaging in various activities. As the child grows old, this self-directed speech is transformed into silent inner speech. Azmita (1992:104) summarizes well the Vygotskian perspective as follows: "Private speech is first used during problem solving in the late preschool years (between 4 and 5 years of age) when children become capable of decentration, peaks between 5 and 6 years of age, and decreases during the middle to late elementary school years when it is internalized and transformed into inner regulation."

Thus, egocentric speech serves as a link between the earliest, undifferentiated social speech and the later inner speech. As Berk (1992:21) points out, the inner speech "is the silent dialogs that we carry on with ourselves."

To sum up, the origins of private speech can be traced back to the use of socialized speech of very young children from 14 to 28 months of age through pretend play (Somulcha 1992). While private speech goes underground as inner speech, the latter does not remain hidden forever. It may surface as private speech. Whenever an individual faces a difficult task, he externalizes his inner speech in order to control the task. Private speech is the means for such externalization, a form of mental action. For a researcher, an individual's private speech provides important clues to his cognitive states in a given task.

### **3. PRIVATE SPEECH AMONG ADULTS**

John-Steiner (1992) provides an excellent overview of some settings in which the use of private speech by adults has been observed. She identifies three main contexts: thinking aloud speech, embedded private speech, and self-regulatory utterances of second language learners. Furthermore, she distinguishes between spoken and written private speech.

I will first summarize some important details & examples from her article. Then, I will refer to a few studies in L2 research that investigate the use of private speech.

According to John-Steiner, most research using the thinking aloud procedure collect data from laboratory settings and artificial tasks. She and another researcher (Soskin and John 1963) collected data on private speech from naturalistic settings, e.g, spontaneous talks among couples engaged in such leisurely activities as learning voluntarily how to making sandals in a craft shop. They discovered that the subjects produced utterances that seemed to function as "verbal exploration of a problem or situation" (256). They concluded that these utterances are produced when subjects faced unfamiliar or difficult tasks. The utterances provide a channel for "self expression and release" and "illustrate the role of language for the self when an individual is faced with a challenging task beyond his/her current level of mastery" (John-Steiner 1992:288). A frequently cited example of an unfamiliar task that may produce private speech is when somebody is acquiring computer skills.

Embedded private speech refers to utterances that occur in public performance settings, e.g., public lectures or classroom lectures. Often, an experienced lecturer in the

course of delivering a lecture will use language for the self, e.g., "Let's see, where was I?" Utterances of this kind are mental acts that help an individual shift, reorganize, plan, and achieve focus in his/her presentation.

The use of private speech can also be observed among adults learning a second language. Because the learners have to perform tasks in a language in which they lack mastery, they would resort to self-directed utterances. A frequently cited example is the task of constructing a story from a given set of pictures, in which learners would say (McCafferty 1990; quoted in John-Steiner 1992:290):

I don't know the name of this ... Hats  
I don't know what to say .... There are five monkeys ...  
Ah, what do I say about this one? Ah, the five monkeys?

Finally, John-Steiner (1992:292), in making a distinction between spoken and written private speech, calls the latter "inner speech writing" that functions as "telegrams for the self." She refers here to highly condensed writing (or "jottings of the minds") in the notebooks of writers and record books of scientists. This condensed writing appears as cryptic notes and provide clues to the cognitive dimensions of individual creativity. John-Steiner provides interesting examples from the notebooks of scholars and writers, including a long passage from the diaries of Virginia Woolf.

John-Steiner's reference to McCafferty's (1990) study is a good example of how the investigation of private speech in the form of self-directed utterances provides a useful approach in L2 research. In fact, several earlier studies provide precedents for this kind of approach. Lantolf and Frawley (1984) and Frawley and Lantolf (1985) find that in the use of such discourse features of narratives as the macrostructural devices in openings, extra-textual information, tense and aspect, and reference, some ESL speakers perform similarly to native speaking children. In fact, in terms of these features, rather than show any native/non-native dichotomy, the ESL speakers at various levels, adult native speakers and native speaking children form a continuum in their performance. Another subsequent study (Ahmed 1988) extends the continuum by showing that even adult native speakers share similar characteristics. In other words, even an adult NS, when faced with an unfamiliar & difficult task, resembles a NNS in the linguistic features of his speech (e.g., tense and aspect). In all these studies, the use of private speech is an important area of investigation.

In the following section, I turn to the use of private speech in a specific context, i.e., task-based dialogs between native and non-native speakers of English. Excerpts from several tasks are micro-analyzed to show that a focus on investigating private speech reveals more complex aspects of dialogic communication at the cognitive level. (For background details about tasks, see note #2.)

#### 4. SELF-DIALOGS IN DIALOGS WITH OTHERS

Dyadic conversation is characteristically bounded by its situational context. It involves two interlocutors engaged in face-to-face communication. As such, as the following excerpt illustrates, it is often a process of interaction in which utterances are exchanged by the interlocutors, one person, for example, asking questions, and the other answering them:

- [1] A. NNS: going to the right?  
B. NS: yeah ... three centimeters long  
C. NNS: exactly right?  
D. NS: yes

Even when the interaction does not explicitly follow the question-answer format, the utterances show a sense of shared knowledge and responsibility between the interlocutors, as illustrated in the following excerpt:

- [2] A. NS: now ... now ... our maps are not the same/ but they're almost the same  
B. NNS: almost same/ and .... there are some .... uh ... there isn't .... something ... in ... in ... my map ... which  
C. NS: which is in my map
- [3] A. NS(X): the wolf won't eat the cabbage  
B. NS(Y): right  
C. X: let's bring the wolf first  
D. Y: OK

In [2] we see that the NNS continues the conversation in (B) where the NS ends in (A) and provides further information. Subsequently, the NS does the same in (C). Similarly, in [3] the NS(Y) reinforces (in B) the NS(X)'s prediction (A) and accepts (D) her suggestion (C). Both excerpts show instances of cooperative dialogs between the interlocutors.

Because of its situational context of face-to-face communication, participants in dialogic speech can rely on extralinguistic elements such as gesture, intonation, pauses, etc. The extralinguistic means of communication leads to unique grammatical characteristics. For example, the utterances may not be fully expanded or explicit, particularly if the interlocutors share knowledge of the speech situation. In fact, dialogic speech often shows a high degree of abbreviation, as the following excerpt illustrates:

- [4] A. NNS: oh ... did he tell us?  
B. NS: you know .... I think ... he meant like .... each  
C. NNS: I know [*both laugh*]

Both interlocutors refer to the researcher. The dialog does not explicitly give any comment or information about what the researcher told or meant. But both of them seem to share some common knowledge, and hence the abbreviation.

An analysis of dyadic conversation could thus begin with the notion that such a conversation deals with, what may be called, *interlocutor* dialog. In other words, the structure of the dialog can be seen as forming a sequential pattern. In this pattern, the utterances of the two interlocutors can be seen as forming a sequence of stimuli and responses in which what one interlocutor says is, ideally at least, related to what the other interlocutor has just said.

However, a more detailed analysis shows that the conversational data also contain instances in which more occurs than just a dialogic exchange. In these instances, the interlocutors may actually not be talking *to* each other; instead they may be talking *across* each other, i.e., to themselves. The following excerpts illustrate this point:

- [5] A. NS: ...so we have to stay ... where there are  
none of these things  
B. NNS: uh.um  
C. NS: OK? / so now ... we ... have to/.../  
Oh ... I see  
D. NNS: OK ... so  
E. NS: do we start at X?  
F. NNS: yes ... and ... first  
G. NS: OK ... below my camp X

The NS' OK? (C) in the form of a confirmation check does not sequentially follow the NNS' affirmation (B) in response to NS' (A). Why would the NS want to confirm when the NNS has already expressed affirmation? Furthermore, the NS' Oh ... I see (C), following a lengthy pause (shown by "/.../"), indicates some change in her perspective. It is evidently not possible for the NNS to share the informational content of the NS' perspectival change; thus, his OK (D) is not a sequential response to (C). The NNS' so (D), following a minimal pause (shown by "..."), indicates the beginning of some proposition, but the NS does not wait for the NNS to complete his proposition and develops her own suggestion (E). In (F), the NNS does respond affirmatively to the NS' suggestion (E), but again he begins to present some proposition in and ... first. However, the NS again ignores (G) the NNS' attempt to express a proposition and, instead, seems to respond to just the "yes" part (F). Thus, the sequence of NS' utterances from (C) to (G) does not follow a sequential pattern in that what one interlocutor says is not merely a response to what the other interlocutor has just said.

Similarly, in a more subtle way, the following excerpt does not fit the expected sequential pattern:

- [6] A. NS: and ... uh ... he can't leave ... the wolf  
and the goat ... alone together  
B. NNS: because ... uh  
C. NS: {right  
D. NNS: yeah}

The NNS' first utterance (B) is implicitly related to what the NS says (A). However, she does not simply affirm but goes further and attempts to present some reason in response

to the NS' utterance in (A). The minimal pause (...) and the hesitation phenomenon ("uh") indicate that her attempt to present the reason is not completed or verbalized. Thus, the NS' right (C), while she is still continuing the attempt, is not appropriate in terms of the criterion of a sequential response, since it appears as an affirmative response to a confirmation check. (C) and (D) are subtle in that they are actually almost overlapping utterances (shown by "{}"). Thus, (D) is not a discrete sequential response to (C).

In this context, the notion of self-directed or private speech becomes crucial for understanding the significance of these instances. In other words, the interlocutors while talking to each other also engage in conversation with the self. At the moment of self-communication, the other interlocutor is excluded from the private dialog. Thus, in [5], the NS' utterances (C, E, and G) form a continuous line of speech in which the shift from We to I, and vice versa, is crucial. In (C), the NS' OK? helps the speaker get ready to take the next step in solving the task-specific problem, which in this case is finding a safe route from one point to another on a given map. Thus, this particular utterance is functionally directed more towards the self than the other.

The subsequent so now (C) shows that she begins her attempt to find the route. The use of we indicates that in her mind she assumes joint responsibility for the attempt by including the other interlocutor, at least minimally. However, the noticeable pause following the use of We is a crucial turning point, indicating some interruption in the attempt. The subsequent Oh indicates she realizes some problem and needs to resolve it, when she says I see after a momentary hesitation. At this point, the use of I is functional in keeping with the cognitive interruption. It shows that as a result of some interruption the speaker abandons her sense of joint responsibility and expresses her own individual self. Thus, Oh ... I see is self-directed speech in that it reveals the speaker's attempt to regain control for herself over what she has been doing, i.e. coming up with some suggestion to the other interlocutor in finding the safe route. The return to we (E) shows that the speaker has already gained control and reassumed joint-responsibility for the task. The OK (G), after the NNS' yes (F), shows that the NS has succeeded in formulating a plan to find a specific route (below my camp). Thus, in this analysis, the NS' utterances (C through G) evidence a combination of other-directed and self-directed speech.

Again in [5], the NNS' OK ...so (D) indicates that, after incorporating what the NS has said in (A), he attempts to present his own strategy for finding the safe route. In fact, (D) directly follows (B) in that (D) does not take into account (C). Again, the yes (F) indicates that the NNS may have in mind something similar to the NS' (E); however, his subsequent ... and ... first indicates that he continues his attempt to present some plan of his own.

If we shift our attention away from speech during moments of dialogic exchange between the interlocutors to stretches of speech of one interlocutor in the data, we find similar instances of private speech. The following two excerpts illustrate this point:



- [7] NS: A. and then he'll come back (*low tone*)/  
 B. no ... wait ... wait /  
 C. how does he do it again? (*very low tone*)/.../  
 D. oh .... OK .... OK (*excited tone*)  
 [The other interlocutor, a NNS, had been looking at her instruction sheet ... but now she looks at the pictures.]  
 E. he takes the ... the goat across first  
 [The NS points out a specific picture to the NNS.]
- [8] NNS: A. distance equation (*very low tone*)/  
 B. O.K. (*very low tone*)/  
 C. wait (*low tone*)/  
 [The tone rises in the following utterance]  
 D. that should be like ... uh ... /.../  
 [Noticeable pause. Murmurs in the following utterances.]  
 E. minus five ... plus two ....and ...plus....minus... four ... minus one .../... / minus five/ ... /  
 [Tone rises in the following]  
 F. this should be .... the answers/ ... / square

In [7], the interlocutors are asked to find out how in a given set of pictures a man is able to carry on his boat his goat, wolf, and a cabbage under certain constraints (source: Ur 1981:62). The NS at this point (i.e., in the excerpt) is trying to explain the man's attempt to his NNS counterpart. As indicated by the fluctuations in his tone, only the last utterance (E) seems clearly other-directed. However, the first four utterances form a stretch of self-dialog, (C) being a question to himself. Similarly, in [8], only two utterances (D & F) are other-directed, but the remainder of the discourse seems self-directed.

A significant instance of self- versus other-directed speech is found in the use of a particular lexical item by the NNS in the NS-NNS dyad on the math task. As shown in the following two excerpts, this NNS, while explaining a math problem to her NS counterpart, first uses the word minus but then replaces it with negative:

- [9] NNS: A. when Y is minus ... negative ... two/  
 B. OK/  
 C. multiply two ... like ... mul ... uh ... multiply two ... X ... plus B/  
 D. should be mi ... negative three  
 E. that's what it is
- [10] NNS: A. why don't we ... plug one .../  
 B. just like a number in it/  
 C. OK ... when X is five ... when X is five ... mi ... negative ten .../  
 D. so that's five .../  
 E. OK?

As shown in [9.D] and [10.C], she utters just the first syllable of minus, seems to self-correct, and then replaces it with the other word. As she explained to the researcher in a post-

task interview, she had been using the word minus in her schooling in Japan before coming to the U.S. However, after interacting with American students and teachers, she realized that the word negative was used instead of minus. Therefore, in the review session (i.e., the math task) she was aware of the presence of a NS and, consequently, corrected her usage by shifting from one word to the other.

In light of this evidence in the data, the speaker's shift occurs whenever she voluntarily addresses the other interlocutor. On the other hand, in instances of self-directed speech, she tends to use minus. This is already shown in [8]. Furthermore, the following excerpts evidence the contrast between self- and other-directed speech in her use of the two lexical items:

- [11] NNS: A. so the .../  
                    *[Tone falls in the following.]*  
              B. should be ... uh .../ minus two ...X  
                    *[Tone rises in the following.]*  
              C. negative two ... X ...
- [12] A. NNS:     Oh ... so I guess .../  
                    no ... this is wrong ... isn't it?  
              B. NS:     you mean this?  
              C. NNS:     wait ... minus (*low tone*)/  
                            *[Tone rises in the following.]*  
                            I guess this is negative, right?

In both these excerpts, minus is used for self-directed speech (indicated by the low tone), and negative to communicate with the other interlocutor. Thus, the two words are functionally differentiated. The shift from one to the other is not error correction or self repair in that it is not replacing an incorrect with a correct form. It reveals the cognitive shift from self- to other-directed speech, in which the two forms represent two distinct cognitive functions.

As a result of this kind of analysis, a more complex structure of dialogic communication in dyadic conversations emerges. Dialogic communication may not consist of only other-directed utterances between the interlocutors. It also consists of self-directed utterances even during those moments when the interlocutors seem to be communicating with each other. Thus, in terms of structural patterns of communication in dyadic conversation, the pattern of sequential and social or other-directed speech is oversimplified. For a more complete analysis, the other pattern of self-directed speech or self-dialog needs to be taken into account.

## 5. CONCLUSION

This paper has introduced the phenomenon of private speech, its theoretical roots in Piaget's and Vygotsky's investigations of children's cognitive development, and the settings in which it is used by adults. It has also referred to a few studies in L2 research that focus on

the use of private speech, and analyzed the discourse features of private speech in dialogic conversations to show the self-dialogic dimensions of dialogs between individuals engaged in doing specific tasks. In this overview, it is argued that the use of private speech is crucial in investigating the cognitive states of an individual in verbal communication.

This approach has several implications for L2 research. First, the view that speech communication entails the sending and receiving of messages between speakers is at best oversimplified. A more accurate approach would be to focus on how individuals cognitively engage in an activity in the face of given tasks and the presence of others. At the cognitive level, an individual's speech may have *inter*-personal or *intra*-personal functions. Investigation of private speech helps uncover these differences and provide insights into the cognitive complexities of interpersonal verbal communication.

The second implication concerns errors and native/non-native speaker distinction. As pointed out in some L2 studies (Lantolf and Frawley 1984; Frawley and Lantolf 1985; and Ahmed 1988), the ESL speakers at various levels, adult native speakers, and native speaking children form a continuum in their performance in specific tasks. The use of private speech in principle cuts across any native/non-native speaker dichotomy. In this context, errors are not seen in terms of any deviations from native-speaker norm, but different cognitive functions. The example of what seems to be self-repair (i.e., *minus* vs. *negative*, in excerpts 9 and 10) has already been explained, not in terms of incorrect vs. correct forms but as self-directed vs. other-directed speech.

Yet another implication refers to what may be called the socio-cultural dimensions of an individual's speech in verbal communication. As already mentioned, private speech is the surfacing of one's inner speech. Developmentally, one's inner speech (the silent verbal thought) comes from social interaction; in Vygotskian view, cognitive development proceeds from the social to the individual. As such, in verbal communication such as dialogs, interlocutors bring in their own perspectives, beliefs, and background knowledge from their past socio-cultural experience. One's use of private speech in a given task ultimately relates to his/her socio-cultural experience.

Having said these, it should be pointed out in conclusion that the field of research on private speech is not fully developed. Diaz (1992) points out serious methodological concerns. For example, he shows how difficult it is to categorize speech as social or private, and how any attempt to investigate private speech raises complex issues. However, in spite of the complexities, he urges researchers to "transform the complex issues into a new set of challenges that will be faced with the creation of new and original methods or investigation" (p. 79). Given this state of art in general, the investigation of private speech from a Vygotskian perspective in L2 research is still in its infancy compared to such other areas as children's cognitive development in L1. Even then, L2 researchers should vigorously pursue this line of investigation. As Schinke-Llano (1993:122) puts it, in the more general context of

Vygotskian psycholinguistics, providing a "cross-disciplinary resource for SLA theory and research," "...it [Vygotskian psycholinguistics] is not only compatible with current SLA theory, but ... it can also provide an extremely productive paradigm within which to conduct research and theory building."

## NOTES

1. Jean Piaget was born in 1896 in Switzerland. His works were originally written in French and published in the 1920s.. They were translated later into English and his ideas spread in the U.S. in the 1950s and the 1960s. He was primarily concerned with how intellectual structures and knowledge grew and developed in an individual's mind. He experimentally investigated the development of children's intelligence. His works have exerted immense influence in the fields of psychology and education. He died in 1980. For an introductory reading, see Wadsworth (1984).

Lev Vygotsky, on the other hand, was a Russian scholar, born in 1896, too. His works were published originally in Russian in the 1930s, some posthumously since he died at an early age in 1934. He edited and wrote the introduction for the 1932 Russian translation of Piaget's famous work (see Piaget 1926/1962). He had numerous scholarly interests: philosophy, theater and literature, psychology, and pedagogy. His main contribution to developmental psychology has been the notion that higher mental processes in the individual originate in social processes and socio-culturally determined tools and signs mediate such development. James Wertsch, an American scholar, has been the main proponent of Vygotskian views in the west. For a comprehensive introduction to Vygotsky and in-depth analyses of his notions , see Wertsch (1985, 1991). For quick introductions, see Foley 1991 and Williams 1989.

2. Four different kinds of tasks are referred to in the 12 excerpts analyzed in section 4: the drawing (excerpt 1), the map (excerpts 2 and 5), the puzzle (excerpts 3, 6, and 7) , and the math (4, 8, 9, 10, 11, and 12) tasks. All these tasks, except the last one, were adapted from published sources. In the drawing task (source: Anderson et al. 1984:147), one interlocutor describes a diagram, and the other interlocutor listens and draws the diagram without looking at it. It is a typical transfer of information activity. In the map task (source: Littlewood 1984:40), the interlocutors have similar, though not completely identical, maps. They try to find a safe route from one point to another on their maps by discussing the features in their maps but without looking at each other's. In the puzzle task (source: Ur 1981:62), the interlocutors discover through talking to each other how a man in a given story solves a problem he faces. The problem the man faces is how to

cross a river by boat and carry his goat, wolf, and cabbage under certain constraints. The interlocutors look at a set of pictures that lend themselves to narrative discourse. Finally, in the math task, two classmates in an undergraduate math class at a university in the U.S. discuss how to solve some math problems. They are in a review session. The NNS is a Japanese female student, while the NS is an American female student.

*This paper is a draft at the moment, as a first step towards a finally revised, expanded, and edited paper.*

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