Semiotic mechanisms in joint cognitive activity

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Abstract

This article examines the communicative, psychological, and semiotic functions of deictic, «common», and «context informative» referring expressions and their role in adult-child interaction. On the basis of theoretical discussion and empirical illustration it is suggested that adults find the various types of «referential perspective» invoked by these three types of expressions to be useful in creating and maintaining intersubjectivity that will enhance cognitive growth on the part of the children.

Key words: Communication, Joint cognitive activity, Intersubjectivity, Semiotic functions, Adult-child interaction, Referential domain, Referring expressions.

Mecanismos semióticos en la actividad cognitiva conjunta

Resumen

Este artículo examina las funciones comunicativas, psicológicas y de tipo semiótico de las expresiones referenciales de carácter «deíctico», «común» e «informativo del contexto», y el papel que ellas juegan en la interacción adulto-niño. Apoyándose en el análisis teórico y los ejemplos empíricos, sugiere la utilidad que los adultos atribuyen a las diferentes «perspectivas referenciales» que esos tres tipos de expresiones ponen en juego, utilidad relacionada con la creación y mantenimiento de la intersubjetividad capaz de potenciar el desarrollo cognitivo del niño.

Palabras clave: Comunicación, Actividad cognitiva conjunta, Intersubjetividad, Funciones semióticas, Interacción adulto-niño, Dominio referencial, Expresiones referenciales.

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I. THE PROBLEM OF COMMUNICATION IN JOINT COGNITIVE ACTIVITY

In recent years there has been a renewed interest in how cognitive activities are carried out by social groups.[1] While most research in cognitive psychology continues to be concerned with how the individual carries out the processes involved in memory, problem solving, selective attention, etc., a growing number of investigators has become aware of the fact that joint cognitive activity is a complex problem in its own right and will require special theoretical and empirical analysis.

There are a variety of reasons for this renewed interest. At the risk of oversimplifying certain of these motivating factors, we shall classify tem into two general categories.

First, several investigators have pointed out that approaches to cognition which focus exclusively on the individual fail to address crucial issues about how cognitive activities are normally carried out in the real world. That is, while not denying the need for studying the performance of independent cognitive agents, these investigators have pointed out that we leave many questions unanswered by failing to study the performance of social groups. For example, Lomov (1978) has pointed out that:

> ... in the majority of experimental studies of psychological processes and functions, only the relationship between subject and object is treated; and activity (chiefly practical activity with objects) is viewed as the activity of a discrete individual. The communication and interaction of this individual with others are not dealt with, though communication is an inseparable part of the realities of human life. Studies have shown that psychological processes unfold differently under conditions of communication from those we observe when we study individual activity (p. 4).

In the U.S., investigators such as Cole, Hood and McDermott (1978) have made similar arguments in connection with the issue of «ecological validity». As part of their argument they have pointed out that a great deal of everyday cognitive functioning is carried out by groups rather than by isolated individuals and therefore many issues of human psychological functioning will remain unresolved as long as we focus exclusively on the latter.

A second reason for paying increased attention to how psychological functioning is carried out in joint activity is that such functioning plays an important role in the development of individuals' cognitive activity. This has long been a theme in Soviet psychology. For example, Vygotsky's argument about the ontogenetic relationship was concerned wiht this issue. The notion that an understanding of individuals' psychological functioning must be based on the social interactional origins of this functioning has been a theme for several other Soviet psychologists as well. El'konin (1971) has argued for its importance in his outline of the dominant activities of different stages of ontogenesis. Proceeding from a slightly different perspective, Kol'tsova (1978) has recently demonstrated the importance of child-child in-

teraction in the processes of concept development. In her study of ninth graders, she found that group discussion of concepts led to better acquisition of these concepts than when they were studied independently.

In the West there has also been a history of interest in how individual psychological functioning emerges out of social interaction. Perhaps the best example of this is G.H. Mead (1934) who argued that psychological constructs such as mind and self can best be understood in terms of the internalization of social interaction. More recently, Wood and his colleagues (Wood, 1969; Wood, Bruner & Ross, 1976; Wood, Wood and Middleton, 1978; Wood, in press; Middleton and Wood, 1978) have studied the various ways that adults tutor children in a task setting and how this tutoring activity leads to improvements in individual children's performance. In connection with this work, Middleton and Wood (1978) have argued that:

> ... the form of dialogue which the thinker holds with himself is rooted in social interaction in the comments, evaluation and structures placed upon his overt action by others in his culture (p. 1).

In our own work (e.g., Wertsch, 1978, 1979a, 1979b, 1979c, in press; Wertsch, Dowley, Budwig & McLane, in press) we have developed a similar line of reasoning about the development of strategic self-regulative abilities in children. We have argued that by carrying out a detailed analysis of the communicative mechanisms wich adults use to regulate children's activity in task settings we can identify a series of transitional stages that lead from «other-regulation» by an adult to «self-regulation» by the child. Our research has led us to argue for a «strong form» hypothesis about the relationship between social and individual functioning. By this we mean that our claim is stronger than simply arguing that enhanced individual functioning results from social interaction. Like Wood and his colleagues, we have argued that the same set of processes and mediational means are used on both the social and individual planes.

Whether one's motivation for studying joint cognitive activity is based on a desire for increased ecological validity or on the desire to trace individual functioning back to its social origins, we see that the social interactional processes found in task settings demand greater attention. In what follows, we shall address an issue that plays a crucial role in the communicative processes in such settings. This issue is concerned with the nature of the communicative mechanisms that make joint cognitive activity possible.

In our opinion social interaction in joint cognitive activity is all too often viewed as an undifferentiated «independent variable». By this we mean that investigators often are simply concerned with whether social interaction is present or absent rather than with the *type* of social interaction involved. For instance, in training studies involving adult child-interaction or in studies of the effect of child-child interaction or discussion, investigators seldom examine the specific types of interaction involved. There is no doubt that such studies which might

be thought of as involving the variable «± social interaction» can contribute to our understanding of human psychological functioning. However, at some point we must turn to the issue of precisely how this interaction takes place and how it affects task performance.

At first glance it would appear that disciplines such as linguistics and psycholinguistics could provide us with some useful insights about the nature of the communicative devices involved in joint cognitive activity. However, much of the recent research in these disciplines has not been concerned with the problems that confront us here. In the West, this state of affairs is largely attributable to the influence of Chomsky (1965, 1968). Of particular importance is his claim about the nature of the problem to be investigated by linguists. In this connection, Chomsky (1968, p. 62) has written, «if we hope to understand human language and the psychological capacities on wich it rests, we must first ask what it is, not how or for what purpose it is used». Even if one accepts this argument for the purposes of studying the linguistic code (something which has been challenged by those concerned with issues of pragmatics), such an approach is of limited value when it comes to analyzing the communicative mechanisms that make joint cognitive activity possible. Rather than being concerned exclusively with the formal rules of syntax, semantics and phonology, we need to develop an analysis of language which is concerned with its purpose specifically, its role in structuring the cognitive and social reality of the group and in facilitating goal directed interaction.

Perhaps the best example of the type of analysis we have in mind can be found in the research being carried out in Oslo by Rommetveit and his colleagues (e.g., Rommetveit, 1974, 1979a, 1979b, 1979c, 1979d, 1979e, 1979f, 1979g; Blakar and Rommetveit, 1979; Hundeide, 1980). In Rommetveit's analysis the central issue in the study of human communication is what he terms the issue of «what is made known» in an act of verbal communication. He has repeatedly noted that the analysis of how experimental subjects process sentences «*in vacuo*» cannot provide direct insight into how utterances are understood and produced in real communication.

In our analysis we shall be focusing on what Rommetveit calls «intersubjectivity». The issues of how greater or lesser degrees of intersubjectivity are established, maintained and re-established lie at the foundation of Rommetveit's approach to the study of human communication. As we shall see, these issues play a crucial role in analyzing joint cognitive activity.

In speaking of the notion of intersubjectivity, Rommetveit writes:

> Communication aims at transcendence of the «private» worlds of the participants. It sets up what we might call «states of intersubjectivity» (p. 9).

The fact that Rommetveit proceeds from this perspective is very important for several reason, perhaps the most important of which is that it provides a key to understanding how joint cognitive activity can be more effective than individual activity. We shall return to this

issue later but we can say now that it, along with several other points, emerge from the fact that Rommetveit's approach explicitly rejects an assumption that underlies many contemporary linguistic and psycholinguistic analysis and makes these analysis less than optimally suited for the investigation of joint cognitive activity. This assumption is that the intersubjectivity which exists between interlocutors is presupposed rather than created in the speech situation. That is, many contemporary analysis are based on the implicit assumption that when interlocutors come together in a speech setting they share a fund of «backgroung knowledge», presuppositions», etc., which provides an agreed-upon foundation for communication. This assumption about intersubjectivity has led investigators to devote *relatively little attention to how speech creates and transforms a speech situation*. Rather, they have tended to make a few statements about the shared background knowledge that exists before an utterance and to devote the bulk of their effort to examining how that utterance fits into the speech setting.

While few investigators have examined how this implicit assumption guides their research, Rommetveit has demonstrated that it often plays an important role in their approaches and becomes highly questionable once it is carefully scrutinized. In particular, he has attacked the notion that perfect or pure intersubjectivity typically characterizes communicative interchanges. He points out that the notion of pure intersubjectivity has been a convenient assumption for many investigators because it allows them to analyze communication in terms of clear, semantically definable literal meanings rather than the complex, partially agreed upon understandings and interpretation that we find in everyday speech. In this connection he writes of Habermas:

> Habermas' promised land of «pure intersubjectivity» is a convenient fiction which allows scholars of human communication to pursue their trade with scientific rigour, formal elegance, and academic success while evading practically urgent and basic existential issues of human intersubjectivity (1979d, p. 148).

Rommetveit has argued that rather than assuming a clearly defined state of intersubjectivity in communicative settings, this should be the very problem that we need to examine. His approach challenges investigators' traditional assumption that the starting point in our analysis is the background knowledge and situation definition that exist in a clearly defined form before and during social interaction. This leads him to argue that our basic research problem must be changed from a narrow concern with how the linguistic code is processed to a concern of how language functions in human social interaction to define and redefine the speacker's and hearer's understanding of the topic and of each other. Furthermore, his approach emphasizes that human communication is seldom near or completely successful. This is attributable to the fact that:

> ... everyday communication takes place in a pluralistic, multifaceted, only fragmentarily known and only partially shared social world, a world fraught

with ideological conflicts, generation gaps, and uneven distribution of power, knowledge and expertise (1979d. p. 148).

He argues that because of this, investigators must seek different ways of asking questions about many aspects of human communication. For instance when dealing with the notion of literal meaning he writes:

> The rejection of the notion of unequivocal literal meaning... implies an approach to semantic problems very different from that adopted by Chomsky, Habermas, Searle, and Labov. We have to assume that people within the same speech community may differ not only with respect to what is taken for granted about the state of affairs they are talking about, but also with respect to what is meant by what is said. The basic problem of human intersubjectivity becomes then a question concerning in *what sense and under what conditions two persons who engage in a dialogue can transcend different private worlds.* And the linguistic basic for this enterprise, I shall argue, is *not* a fixed repertory of shared «literal» meanings, but very general and partly negotiable drafts of contracts concerning categorization and attribution inherent in ordinary language (1979f, p. 7).

Taken out of context, these theoretical statements are somewhat vague, but we shall see that the general approach reflected in them can provide a useful framework for understanding the processes inherent in joint cognitive activity.

The general point that Rommetveit's work adds to our arguments about joint cognitive activity is that we must be much more aware of the fact that when interlocutors enter into a speech setting they may have different perspectives on what is taken for granted and what certain utterances are intented to convey. Furthermore, we must be aware of the fact that when two parties interact, it is seldom the case that one defines the speech situation neatly and that the other «buys» this definition completely. Rather, the process of interaction involves modifications and transformation in both parties' understanding of the speech setting hat is, the process of «negotiation» as Rommetveit puts it. As the work of Rommetveit and his associates has shown, there are many complex aspects to interlocutor's understanding of the speech setting that is, the process of «negotiation» as Rommetveit puts sic trust in the other's communicative abilities and good intentions to the way a certain referent is categorized or understood. Undoubtedly all of these aspects of the speech situation play a role in making joint cognitive activity possible. In this paper we shall deal with only one of the issues in this area. This is the issue of how interlocutors agree or fail to agree on a particular categorization of objects in the speech setting. We would certainly no claim that this is the only issue in the processes of joint activity. However, it is a topic that has been studied by several investigators for a variety of reasons. Before turning to our more detailed analysis of the semiotic mechanisms that make joint cognitive activity possible when the interlocutors agree to varying degrees on the categorization system, let us turn to an illustration from existing literature on joint cognitive activity.

In one of the studies reported in a recent paper by Lomov (1978),

subjects were given the task of drawing a map of a major street intersection in Leningrad. First, subjects were asked to do this alone, and then after several days they were asked to do this same task by working in pairs. The point we wish to examine in connection with this study is concerned with how subjects carried out the second task —that is, the one requiring joint cognitive activity. In general, Lomov reported that.

> ... the *accuracy and thoroughness* with which topographic mental pictures were reproduced were greater under communicative conditions than under conditions of individual activity (1978, p. 12).

What interests us most is Lomov's account of the social interaction paterns that made this enhanced joint activity possible. In this connection he reports an excerpt of the dialogue between two of the participants. This dialogue proceded as follows:

B: (interrupting A). I don't understand what vantage point you're looking from.
B: I'm going along the Nevski prospect to the Admiralty.
B: Oh... But I still don't understand. Where's the Arch? (meaning the Chief of Staff Arch).
A: Here it is (indicative gesture).
B: And how do yo get to the Arch?
B: Here's Hertzen Street (descriptive gesture).
B: I don't understand. Hertzen Street is perpendicular to the Nevski Prospect.
A: But the Nevski Prospect goes into the Admiralty, and behind it is the Neva (River). I'm going along here straight to de Admiralty (imitative gesture).
B: Yes, I see that. But I don't understand how you're doing this. From the Arch you go straight to the Neva, and along the Nevski Prospect it looks like you can go straight to the Neva too (jokingly) Maybe there are two Admiralties? Well, actually, here's the way it should be... The Nevski curves a bit here (descriptive gesture...).
A: Curves? What do yo mean? The Admiralty isn't visible from the Moscow Railroad Station... (p. 10).

This segment of dialogue includes several points of interest. Lomov (1978) notes that.

> In the initial stage of communication the chief objective (as in the preceding series of experiments) was to define common points of reference (common coordinates) (p. 11).

In Rommetveit's terms, the subjects in this task had to create at least a minimal level of intersubjectivity in order for communication to proceed. This was accomplished by identifying several referents which could serve as points of shared attention.

Given this agreement on referents, however, the next thing we notice is that the subjects have different ways of looking at or thinking

about these referents. In this case there is literally a difference in perspective since

> ... A picked the junction of the Nevski Prospect with the Admiralty as his first point of reference, whereas B picked the Chief of Staff Arch (Lomov, 1978, p. 11).

That is, we have an instance here where the interlocutors agree on a great deal about the task setting (e.g., the goals and the means for reaching the goals, the way or working toghether, the general nature of the referents). However, they were not in complete agreement over how the referents were to be viewed.

This state of being partial, *but not complete,* agreement (specifically agreement on referents but not on the perspective from which they are considered), is of crucial importance for understanding the dialogue in this case. What seems to have happened in that even though the dyad started out by creating a shared understanding about which referents were at issue, the fact that they did not agree on perspective provided a constant source of «creative tension». Because B approached the referents from a different vantage point than A did, the image that he created continually conflicted with A's drawings and comments.

It is interesting to note that the difference in perspective was not simply abolished even though it was recognized at an early stage of the interaction. That is, when the interlocutors became aware of the fact that their perspectives were not in agreement, they did not find it necessary to negotiate complete agreement on this issue before proceeding further in their interaction. It was neither the case that one interlocutor simply dropper his perspective in favor of the other's, nor was it the case that they negotiated some compromise position. Rather, the difference in perspective was recognized but maintained throughout the interaction.

Rather than assuming that perfect agreement on such matters of perspective should be reached before optimal communication can proceed, it appears that the difference in the perspectives used by the subjects in Lomov's study served an important role. It produced the «creative conflict» that is necessary for optimal group interaction. When interlocutors interact in a setting where there is agreement on a referent but lack of agreement on perspective on that referent, the resulting conflict would appear to be an excellent source of hypotheses and feedback mechanisms. When this creative conflict does not exist and initial hypotheses are not subject to as great an amount of corrective feedback, the product of cognitive activity may be less adequate. Lomov's account of subjects' performance on this task suggests that this is precisely one of the factors that distinguishes individual from joint activity. In individual cognitive activity, it may be less likely that differences in perspectives will arise and have to be resolved than is the case in joint cognitive activity.

We should note that we do not wish to draw the line between individual and joint cognitive activity too sharply since it seems that

many of the same processes and mediational means are used in both. This point has been argued by several investigators in connection with dialogic reasoning processes that appear on the social as well as the individual plane of functioning (e.g., Peirce, 1977; Voloshinow, 1973; Vygotsky, 1956; Wertsch, 1979c).

The general point we have been developing so far about joint cognitive activity can be summarized as follows. The process of joint cognitive activity usually, if not always, involves partial, but not complete, agreement on how the interlocutors define the task setting. As Lomov suggests, some agreement on point of reference is necessary if communication is to proceed. However, as we have suggested, lack of agreement on how certain aspects of the task setting are viewed may be crucial for producing the creative conflict required for optimal joint cognitive activity. We can conceive of this lack of agreement in terms of Rommetveit's notion of transcending one's private world in order to create a «state of intersubjectivity», remembering all the while that this state comprises a «multifaceted, only fragmentarily known and only partially shared social world». The specific semiotic mechanism we shall examine in more detail in the next section is reference. This will allow us to focus on the process whereby interlocutors can begin their joint cognitive activity by agreeing on a referent but not agreeing on how the referent is to be thought of or defined. In doing so we shall develop a more specific notion of perspective —specially, referential perspective. As we shall see, one issue in defining the intersubjectivity or shared social reality in joint cognitive activity is the issue of what type and level of referential perspective is being used by the interlocutors.

II. REFERENTIAL PERSPECTIVE

We begin our account of referential perspective with the fact that in order to function effectively in joint cognitive activity, interlocutors must be able to direct one another's attention to specific objects and events. In order to deal with this issue we need to examine the semiotic problem of *reference*. Specifically, we shall be concerned with utterances in which a speaker identifies a nonlinguistic referent in the speech situation. This involves the relationship between sign *tokens* (unique utterance event) and nonlinguistic objects or events.[2]

A fundamental fact about reference is that one and the same referent can be referred to or identified in a variety of ways (i.e., by using a variety of referring expressions). For example, let us assume the following object is the referent that a speaker wishes to identify

(the «intended referent»): ◯

In this case the speaker has a variety of referring expressions from which to choose. A sampling of the posibilities includes:

1-a ...the round thing...
1-b ...the, white thing...
1-c ...the round white thing...

Although any one of these expression can be used to identify the intented referent, they obviously differ in some important respect. The notion of *referential perspective* that we shall develop here is designed to account for this difference. The referential perspective involved in an act of referring is the perspective or viewpoint utilized by the speaker in order to identify an intended referent. It is a necessary part of any act of referring. Expressions 1-a through 1-c illustrate that the intended referent is not inextricably linked to any particular referential perspective (as in some kind of naming theory). That is, although a single intented referent may be involved, the perspective from which it may be identified may vary. Thus in 1-a the object is identified in terms of its shape; in 1-b it is referred to in terms of its color; and in 1-c it is identified from a perspective which combines these dimensions.

Notions which are related to our idea of referential perspective have often emerged in linguistics and semiotics. For example, Rommetveit (1974) has introduced the notion of the HERE-and-NOW, and Schutz (1951) has dealt with the issue of how speech can focus interlocutors' attention on one attribute of an object to the exclusion of others. In developing his notion of «scene» Fillmore (1977) has proposed a notion of perspective which perhaps comes closest to what we have in mind. While his goals in analyzing language and speech are different from ours, his general definition of perspective turns out to be quite similar.

> ... Whenever we pick up a word or phrase, we automatically drag along with is the larger context or framework in terms of which the word or phrase we have chosen has an interpretation. It is as if descriptions of the meanings of elements must identify simultaneously «figure» and «ground» (p. 74).

Some readers may be tempted to argue that there are cases in which a speaker does not introduce a perspective when referring. For example, they might argue that one could identify the intended referent by using nonverbal pointing and/or an expression such as 2-a or 2-b.

2-a ...that...
2-b ... that one...

This line of reasoning assumes that such verbal and nonverbal means can be used to identify the intended referent but are devoid of content and therefore do not involve the introduction of a perspective. While we would agree with the claim that different levels and types of perspectives exist (a point which we shall examine in more detail later), we do not agree that *no* perspective is involved in cases of nonverbal pointing and/or deictic expressions. We would argue that

even in these cases, the speaker's communicative act necessarily defines the intended referent in a minimal way (namely in terms of spatiotemporal contiguity between the intended referent and the speaker).

The fact that a speaker necessarily introduces some perspective in any referring act is only the starting point in our argument. The main questions we wish to address are concerned with *how* and *why* a speaker introduces a particular perspective. These questions lead us to a consideration of: a) the range of semiotic options available to a speaker when introducing a perspective into a speech situation, and b) the reasons for selecting one of these options over another. We will consider these two issues briefly in the next two subsections of II and then, in section III, turn to an analysis of how our conclusions can be applied to the analysis of joint cognitive activity.

IIA. Semiotic Options for Introducing Referentical Perspective

An examination of the semiotic devices which can be used to introduce referential pespective reveals that there are several options available to a speaker. In this sections we shall analyze a few of the options which are relevant for our account of joint cognitive activity. We should note that since our analysis is being developed with this specific application in mind, it should not be viewed as an exhaustive treatment of any general semiotic issue.

Our analysis is based on the fact that when identifying an intended referent, a speaker can introduce different amounts of information about referential perspective into the speech situation by choosing different types of referring expressions.[3] In examining this issue we shall proceed from expressions which minimize the amount of information about speaker perspective introduced into the speech situations to expressions which maximize such information. This involves moving from deictic and «common» referring expressions to «context informative» referring expressions.

One of the most important semiotic devices that allows a speaker to identify an intended referent while minimizing information about his/her perspective is deixis. Deixis falls under the category of what Peirce (1931-1935) termed «indexical signs». He developed the notion of an index, along with the notions of an icon and a symbol in one of this trichotomies of signs. The criterion for distributing signs into categories in this trichotomy is the relationship between a sign vehicle and its object. Burks (1949) has summarized this trichotomy of Peirce' as follows:

> A sign represents its object to its interpretant symbolically, indexically, or iconically according to whether it does so 1) by being associated with is object by a conventional rule used by the interpretant (as in the case of «red»); 2) by being in existencial with its object (as in the case of pointing); or 3) by exhibiting its object (as in the case of a diagram) (p. 674).

Burks proceeded to describe indexes in more detail by saying:

> Consider... the act of pointing. Its object is whatever is pointed to, that is, whatever is in a certain physical relation to the sign. Here the tree [i.e., the object being used here as an example - J. Wertsch] is selected or indicated by virtue of its being in the direction of the pointed finger, only a few yard away from it, etc. Hence the act of pointing is an index, i.e., a sign which determines its object on the basis of an existential connection. The symbol «this» is also an index, because (apart from the conventional element by virtue of which it is a symbol) it may function very much the same as the act of pointing; i.e., instead of pointing to a tree one may use the phrase «this tree». The object of a specific occurrence or token of «this» is determined or selected by virtue of its being in some existential relation to the occurrence of the sign itself (p. 674).

The general analysis of indexical signs has recently been extended by Silverstein (1976). He has pointed out that indexical sign types can be characterized along two major dimensions. First, indexicals can be analyzed in terms of the degree to which they serve a referential or nonreferential function. Given our focus on the issue of reference in this paper, we shall be concerned only with the former. Second, Silverstein has shown that indexes can be distributed along a dimension which runs from «maximally presupposing» to «maximally creative» (or «performative») types. Our focus here will be on maximally presupposing indexes —specifically, maximally presupposing referential indexes. Deictics such as nonverbal pointing or *this* and *that* in English are perhaps the best example of this kind of index. In connection with deictics Silverstein (1976) has noted that:

> When we use a token of the full noun phrase *this table* or *that table* (with stressed full vowels in both words), pointing out thereby some particular object, the referent of the token of *table* must be indentifiable, must «exist» cognitively, for the deictic itself to be interpretable. The proper use of the token of the deictic presupposes the physical existence of an actual object which can properly be referred to by *table*, or it presupposes a prior segment or referential discourse which has specified such a referent. Otherwise the use of the deictic token is inappropriate; it is uninterpretable and confusing (p. 33).

Thus we see that an appropriate use of deictics assumes that the intended referent already exists cognitively for the interlocutors —a very important fact for our purposes. Given that the identity of the referent is presupposed, and given that a deictic referring expression serves simply to point out this intended referent, the use of such a referring expression introduces only a minimal amount of information about referential perspective into the speech setting. This is what Morris (1971) had in mind when he made the following statement about indexical signs.

> The semantical rule for an indexical sign such as pointing is simple: the sign designates at any instant what is pointed at. In general, an indexical sign designates what it directs attention to. *An indexical sign does not characterize what it denotes (except to indicate roughly the space-time co-ordinates)* and need not be similar to what it denotes (p. 102) (underlining ours-J. V. W.).

If we return to our intended referent on page 12 we can see that a speaker can minimize the amount of information he/she introduces into a communicative situation by using deictic signs, such as nonverbal pointing or verbal expressions like 2-a and 2-b. Information is minimized in the sense that the deictic introduces information which for the most part is already available to the listener and is therefore redundant. This follows from the facts that the existence or the intended referent is presupposed and the referring expression serves simply to point it out. Thus we see that in general, when a speaker uses expression such as «that» to identify the intended referent, he/she introduces very little information about a particular way of perceiving or thinking of the object.

There are two points worth noting in connection with this claim about deictic signs. First, the use of a deictic sign to refer does not necessarily indicate that the speaker *cannot* or *does not* think of the referent in some more complex way. It simply means that the speaker has not explicitly introduced such information into the speech situation. In some cases, the use of a deictic may reflect the fact that a perspective has already been explicitly introduced earlier in the discourse or can readily be assumed. For instance, if two interlocutors have been discussing the structure and function of an object which thy have in front of them and one of them identifies the object by using the expression «that» we can assume that both parties are familiar with a more complex referential perspective because it had been introduced earlier (although the use of the indexical referring expression does not explicitly introduce or re-introduce it at this point). In other situations, a speaker who could introduce a great deal of information about a referent may specifically choose to minimize this information because it is unnecessary or inefficient to introduce it into the current speech situation. For example, if an adult speaker wants a child to hand him/her an object which is totally unfamiliar to the child, it may be more efficient to say «Hand me that please», rather than using a more descriptive referring expression. Thus the first qualification or our general claim about deictic referring expressions is that the use of such expressions does not necessarily reflect the way the speaker actually does or could understand the referent.

Our second qualification is that when dealing with the general problem of referring expressions we are usually concerned with *levels* of indexicality rather than its simple presence or absence. Thus the use of nonverbal pointing alone (i.e., without an accompanying verbal utterance) to identify an intended referent may introduce even less information about referential perspective than does an utterance such as 2-a or 2-b because it may not signal relative proximity between speaker and object. Such nonverbal pointing relies to an even greater degree on indexical, as opposed to symbolic or iconic, signs. Conversely, expressions such as 1-a and 1-b which rely more heavily on symbolic signs than 2-a and 2-b still involve an element of indexicality due to the presence of «the».

Whereas this first minimal level of information about a speaker's referential perspective involves one of the subcategories of indexical

signs, the remaining two semiotic mechanisms rely primarily on symbolic signs. A second way that it is possible for a speaker to minimize the information about referencial perspective that is introduced into a speech situation is to use what we might term a «common referring expression». Here we are borrowing from Roger Brown's (1970) analysis of how a child is introduced to the way that everyday objects are identified in speech. Brown argues that while it is true that we can use a variety of expression to refer to an object, there is typically a «most common name» in a speech community which is based on the function that the object normally (i.e., most commonly) has.

> The name of a thing, the one that tells what it «really» is, is the name that constitutes the referent as it needs to be constituted for most purposes. The other names represent categorizations useful for one or another purpose. We are even likely to feel that these recategorizations are acts of imagination, whereas the major categorization is a kind of passive recognition of the true character of the referent (p. 10).

In the case of the intended referent introduced earlier, 1-a or 1-b could be used as common referring expressions. In the case of any actual utterance event, one of these common referring expressions may indeed be most appropiate and informative for identifying the intended referent (i.e., it may introduce the appropiate referential perspective). The very definition of a common referring expression guarantees that the chances of this being true are fairly high.

However, we would like to point out that the use of a common referring expression does not always indicate that the speaker has chosen to introduce the referential perspective which is most informative in the particular speech situation. In certain cases a speaker may use such expressions when he/she is not concerned with whether the listener understands or categorizes the intended referent in the special («uncommon») way that most closely reflects how the speaker's understands the referent in that particular speech setting. That is, the speaker's concern with identifying the intended referent may override his/her concern with introducing the most appropriate referential perspective. For example, suppose that a speaker and a listener are discussing vehicles and one of them makes a schematic drawing of a wheel that is similar to our intended referent on page 12. The way that the speech situation is defined in such a case makes it perfectly reasonable for the speaker to refer to the object by using the expression 1-d.

1-d ...the wheel...

Now let us suppose that someone who is uninformed about the ongoing conversation appears on the scene and the speaker wishes to identify the intended referent for this party. If the speaker begins by mentioning «the wheel», the new listener may ask for clarification since he/she does not have access to the definition of situation in which this referring expression would be readily interpretable. At this point the speaker could be reasonably certain that by switching to «the round

thing» or «the white thing» the new listener could indetify the intended referent. The reason for the switch and the reason for the successful result is that the speaker changed from a referential perspective which is tied to a specific of conversation to the perspective of the common referring expression.

In some sense the speaker in «misleading» the new listener because he/she is not identifying the object in a way that reflect the most appropriate referential perspective in that setting. Depending on how important this referential perspective is for his/her present purposes, the speaker may be more or less willing to switch to the common referring expression. What we have said here does not provide a detailed analysis of when and why a speaker might wish to make such a switch. It simply points out that *if* the speaker is more concerned with identifying the intended referent than with introducing a particular referential perspective, he/she can resort to the common referring expression instead of one that relies on another perspective.

As was the case with deictics, the use of common referring expressions is not maximally informative because it introduces redundant information. In this case the redundancy does not arise because the information is available in the spatiotemporal organization of the speech event. Rather, it is redundant because the common referring expression is the one that the listener himself/herself would have chosen if he/she had to make a choice with no additional contextual information. Thus to identify our intended referent by using common referring expressions such as «the round thing» or «the white thing» is to tell him/her nothing new since it introduces the perspective which the listener would be most likely to choose on his/her own.

In developing this account of common referring expression, we have touched on a third semiotic mechanims —one which allows a speaker to maximize the amount of information about referential perspective which is introduced into the speech situation. In our example of the conversation in which «the wheel» could serve to identify the intended referent was saw that a referring expression could introduce a perspective which is informative about the specific way that the speaker views the referent at the time of the speech event. We will label such a referring expression «context informative». A context informative referring expression introduces more information into the speech situation than a common or deictic referring expression in the sense that it introduces a perspective that would not already be obvious to someone who has just entered the speech situation. In our case above, the uninformed listener could have identified the intended referent as «that» or «the round thing» without ever having participated in the conversation. If the speaker in this case selects one of these expressions to identify the intended referent, he/she is adding little to the uninformed listener's understanding of that referent. On the other hand, if our speaker has insisted on referring to the object as «the wheel», the uninformed listener would be forced to define the referent in a new way based on the speaker's definition of the immediate speech situation.

These facts ilustrate that deictic and common referring expressions (with their associated perspectives) provide a «default» option (vis-a-vis context informative expressions). A default option can be used when speaker wishes to identify a referent without introducing an informative referential perspective. This does not mean that every use of a deictic or common referring expression indicates that the speaker is falling back on a default option. If a speaker wished to identify the intented referent on page 12 in the course of a discussion about colors, an expression such as «the white thing» might be maximally informative. Thus our claim is not that every use of a deictic or common referring expresion indicates that the speaker has selected a default option. Rather, it is that when a speaker wishes to use a default option, a deictic or common referring expression may be the device that most readily serves his/her purpose.

In this section we have outlined some of the semiotic devices that make it possible for a speaker to introduce varying amounts of information about referential perspective into the speech situation. Our account started with types of referring expressions which allow speakers to minimize information about referential perspective (deictic and common referring expressions) and then moved to referring expressions which allow speakers to maximize such information (context informative referring expressions).

IIB. Speakers' Reasons for Introducing Particular Referential Perspectives

In this section we shall discuss some of the factors that motivate speakers to choose one referring expression (and therefore referencial perspective) over another in a particular communicative situation. Our analysis here is based on the speaker's goal in referring to something. When analyzing a speaker's goal, we must also consider the specific conditions in which the goal is to be carried out since such conditions often influence the choice of means and/or the definition of the goal itself.

A few studies already exist that can shed light on this issue. For example, in his account of a «cognitive theory of semantics» Olson (1970) has pointed out that the conditions in which a speaker operates when attempting to identify a referent for a listener have a powerful influence on the selection of a referring expression. He has illustrated his argument with a communicative context in which a gold star is placed under a small wooden block and a speaker who knows its location is assigned the task of telling a listener who does not know its location where to find it. In several trials the star is always placed under the same small, round, white block but different sets of other blocks («alternative» blocks) surround this target block. In one case the alternative block is a small, round, *black,* one; in a second case the alternative block is a small, *square,* white one; and in a third variant there are three alternative blocks —a round black one, a square black one, and a square white one. These three cases are shown in Figure 1.

FIGURE 1/*FIGURA* 1

Case (Caso)	Intended referent (Referente deseado)	Alternative (Alternativa)	Utterance (Locución)
Case 1	○	●	.... the white one (*el blanco*)
Case 2	○	▢	.... the round one (*el redondo*)
Case 3	○	● ▨ ▢	.... the round, white one (*el redondo, blanco*)

Olson points out that in these three cases speakers typically select different referring expressions. In the first case they are likely to say, «It's under the *white* one»; in the second case, «It's under the *round* one»; and in the third case, «It's the *round, white* one».

Olson's examples provide a clear illustration of how certain conditions (the nature of the alternative objects in which the intended referent is situated) provide the speaker with a reason for taking a particular referential perspective. This led him to conclude that:

> In general, it would seem to be the case that an utterance never exhausts all the possibilities of a perceived referent. One could find new properties of any event as long as the event was put among different sets of alternatives (p. 265).
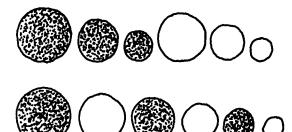
Thus we see that the first reason for selecting a particular referential perspective is to set the intended referent apart from alternative objects in the speech situation. In order to do this the speaker must select a referring expression that not only correctly identifies the intended referent, but also rules out other possibilities.

Rommetveit (1979e) and his colleagues have recently conducted studies which suggest a second reason for choosing one referential perspective over another. These investigators have begun to examine how the interlocutors' definition of the speech situation in a task setting may influence the listener's performance on Piagetian tests of logico-mathematical reasoning. Building on Olson's ideas and procedures, they have argued that speaker's choice of a referring expression (and hence, referential perspective) may influence the difficulty of a task for children. In their studies Rommetveit and his colleagues have used various referring expressions when requesting 6- and 7 -years-old to point a particular item in an array or «referential domain». There were several conditions and referential domains in this study, but our point concerns the following example (from Rommetviet, 1979, p. 458).

In each case a child was requested to point out «the one of the white circles that is second largest». (The actual expression in Norwegian was, «den av de hvite rundingene som er vest storst.») They found that many of the children who correctly identified the intended referent in Referential Domain 1 did not do so when confronted

FIGURE 2/*FIGURA 2*

Referential Domain 1
(*Dominio referencial 1*)

Referential Domain 2
(*Dominio referencial 2*)

with Referential Domain 2. Furthermore, they found that the mistakes in Referential Domain 2 were usually of the same type. These mistakes consisted of pointing to the second largest of *all* circles (i.e., the second from the left in Referential Domain 2) rather than the second largest of the white ones only.

The next condition that Rommetveit introduced into this study is the most important for our purposes. He reported that by changing the referring expression, some children's performance improved on this task. Specifically, he found that when he referred to the intented referent in Referential Domain 2 as «the one of the *snowballs* that is second largest», some of the children who had failed to identify the correct object when the expression «white circle» was used were able to carry out the task correctly.

Rommetveit (1979e) points out that the same reasoning in terms of Piagetian cognitive operations is involved in both cases.

> The child must obviously be able to cross-classify and order objects and, in addition, be capable of restricting his ordering operation to one particular subset of the referential domain while attending to the entire set of objects (p. 459).

Rommetveit goes on to argue that the improvement in performance that occurred when the referring expressions are changed must be explained in terms of how effective certain referring expressions are in guiding children's perceptual and attentional processes.

> What is achieved by verbal categorization of the subset as SNOWBALLS is thus an effect comparable to that obtained by spatial separation of the two subsets in (Referential Domain) 1: white objects are apparently *mentally set apart* from all others in such a way that ordering of the entire set is prevented (1979e, p. 459).

This argument points to a second reason for selecting a particular referential perspective, a reason which is different from that pointed out by Olson. Recall that in Olson's analysis the choice of a particular referential perspective was motivated by the array of objects in which the intended referent was found. In Rommetveit's study, on the other hand, alternative referring expressions were found to be differentially

effective in the presence of the *same* referential domain. Furthermore, Rommetveit's study involved pairs of referring expressions (e.g., white circles versus snowballs) which are extensionally equivalent in terms of how they set the intended referent apart from the surrounding objects. Hence in this case the difference in performance cannot be attributed to the nature of the alternative objects in the referential domain.

When confronted with such a situation, what could motivate a speaker's selection of one referential pespective instead of another? Obviously, the answer is to be found in the fact that a speaker can attempt to utilize referential perspectives which will make the listener's perceptual and attentional task requirements easier. This answer does not address the issue of *why* certain referential perspectives should be easier than others in particular speech settings. It simply takes note of the fact that a speaker may sometimes select or shift perspectives in order to accomodate to a listener's abilities, independently of the referential domain in which the intended referent is located.

To summarize, in section II we have outlined the notion of referential perspective. This has included an analysis of some of the semiotic devices that make it possible for a speaker to minimize or maximize the level of information about referential perspective introduced into the speech situation and a very account of some the reasons for choosing one perspective over another. In the next section we shall apply these notions to the analysis of joint cognitive activity. There we shall be concerned with how the selection of a particular referential perspective may be motivated by the need to establish and maintain at least a minimal level of intersubjectivity in joint cognitive activity (specifically, in adult-child joint cognitive activity).

III. SELECTION OF REFERENTIAL PERSPECTIVE IN JOINT COGNITIVE ACTIVITY: AN ILLUSTRATION FROM ADULT-CHILD INTERACTION

In this section we shall utilize the semiotic notions we have outlined in order to examine adult-child interaction in a problem solving setting. We have chosen to examine how adults and children enter into joint cognitive activity because this type of interaction provides some of the best examples of the difficulties interlocutors can have in «trascending their private worlds» to form a temporarily shared social reality. In this type of interaction the two participants often have quite different understandings of the task and the objects in the task setting. Thus the problems involved in creating and maintaining intersubjectivity are severe. However, in our research (e.g. Wertsch, 1979a; Wertsch, Dowley, Budwig & McLane, in press) we have consistently found that adults are quite adept at using semiotic devices such as referential perspective to assure that at least a minimal level of intersubjectivity is created.

As we shall see, the analysis of adult-child interaction raises seve-

ral issues in addition to illustrating the general problems of creating intersubjectivity, it can provide some insight into socialization processes.

Before turning to the analysis of segments of actual interaction, a few caveats are in order. First, our data are based on observations of Western middle-class adults and children. Since the goal for our analysis is to examine the theoretical possibilities for manipulating referential perspective rather than to report empirical results, this restriction does not invalidate our argument. However, we would agree with those who argue that more empirical studies (e.g., of interaction in different cultures) will be needed before we can begin to provide a general account of how joint adult-child cognitive activity is carried out.

Second, although our illustration will involve ontogenetic comparisons, it should not be assumed that specific, identifiable changes in referential perspective, intersubjectivity, shared social reality, etc., are neatly tied to specific age ranges. In some cases we would expect to find such transitions within a single interaction session (i.e., we could expect to find «microgenetic» changes) and in other cases there might be no apparent differences between children from different age groups. While we would predict a specific sequence of development (i.e., from certain types of referential perspective to others), this notion of development should not be equated with a particular ontogenetic timetable. In particular, we would stress that we are not arguing that 2-year-olds perform at one specific level, 3-years-olds at another, etc. The specific time frame will depend on a number of factors such as the difficulty of the task, the interlocutors' experience with the task, the interlocutors' age, etc.

Third, while our illustration will be concerned with a problem solving task, we would argue that our general ideas about referential perspective, intersubjectivity, etc., can also be applied to other types of joint cognitive activity (e.g., memory).

In our analysis we shall draw on interaction data from a task in which mother-child dyads were assigned the goal of constructing one puzzle (the «copy» puzzle) in accordance with another (the «model» puzzle). In our study the physical layout of the task setting was such that the mother and child were seated side by side. The model puzzle was placed in front of the mother, the copy puzzle in front of the child, and there was a pile of pieces placed off to the side of the child. The pieces to be used to make the copy puzzle in accordante with the model were to be selected from this pieces pile. The task session began when an experimenter showed the mother and child two identical puzzles (the model and the copy). The experimenter directed their attention to the fact that both puzzles had identical colored pieces in identical locations. Then, with the mother and child still watching, the experimenter dismantled the copy puzzle and put all of the pieces, along with several extra ones, in the pieces pile. The experimenter then asked the child to reconstruct the copy in accordance whit the model and told the mother that she could assist whenever she thought it necessary. These sessions were videotaped, and the speech and relevant nonverbal behaviors (e.g., pointing, eye gazes) were

transcribed so that detailed analyses could be made. The children in our study were of preschool age (2 1/2, 3 1/2, or 4 1/2-year-olds).

We shall analyze excerpts from the interaction that occurred between two preschool boys and their mothers. The first boy was a 2 1/2-year-old who had little success in carrying out the task. As will become clear, in this case the joint cognitive activity of the adult-child dyad never really dealt with the complex strategy involved in constructing the copy puzzle in accordance with the model. Rather, the interaction was continually disrupted by the fact that the child seemed to categorize the objects in the taks setting in a way that was quite different from the mother's. To illustrate this point, we shall examine several interchanges about the pieces that represented wheels in the truck puzzle. There were four «wheel pieces» —two black discs (about 3 cm in diameter) which represented the tub or hubcap and two white circles which represented the tires. The centers of these white pieces were carved out so that the black pieces fit inside them. We shall examine seven excerpts of the discourse between this 2 1/2-year-old child (C) and his mother (M). These excerpts of interaction include all the instances in which the mother referred in any way to the wheel pieces. The excerpts are presented in the same temporal order that they appeared in the complete record of the problem solving session, the only difference being that in the complete record of the interaction there were intervening segments of discourse.

Excerpt 1

(3) C: *Look it, crackers. Look.* (C looks at the pieces pile, C picks up an inner wheel piece from the pieces pile, C picks up an outer wheel piece from the pieces pile.)

(4) M: *Crackers. They sort of look like crackers.* (C put the outer wheel piece in his hand down in the pieces pile, C picks up an outer wheel piece from the pieces pile.)

(5) C: *Crackers.* (C puts the inner wheel in his hand back in the pieces pile.)

(6) M: *Mm-hm.* (C picks up another outer wheel piece from the pieces pile.)

(7) C: *Look, look,... look at the crackers.* (C picks up several additional nonwheel pieces from the pieces pile.)

(8) M: *They look like crackers. But they aren't crackrs. But they aren't crackers. I think what we're supposed to do here is make this truck.* (M pats the model puzzle.)

(9) M: *Can we do that?* (M points to the empty frame where the copy puzzle is to be made.)

(10) M: *Make this truck.* (M pats the copy puzzle frame) *to look like this truck.* (M pats the model puzzle, C puts all the pieces in his hand back into the pieces pile.)

(11) M: *Where are the wheels?* (M points to the wheel pieces in the model puzzle, no response from C.)

(12) M: *I think we're supposed to leave this truck* (M points to the model puzzle) *all together and make a truck right here.* (M

points to the empty frame for the copy puzzle) *that looks like this one.* (M points to the model puzzle.)

(13) M: *Let's find the wheels for this truck.*

(14) C: *What's this?* (C picks up the truck body piece from the pieces pile.)

Excerpt 2

(15) M: (C is putting a wheel piece in the copy puzzle) *There's the wheels to the truck. Mmmm. Where's the car?*

(16) M: *Okay, I thing this fits... I think the wheels fit rigth in here.* (M points to the place for the wheels in the copy puzzle.)

Excerpt 3

(17) M: (C begins to put a wheel piece in the copy puzzle) *Oh good. Can you fit this down in this space here?* (M points to the correct location for the wheel piece in the copy puzzle.)

Excerpt 4

(18) M: (C is holding a wheel piece in his hand) *No. It doesn't go there.*

(19) M: *May be it would have gone in here?* (M points to correct location for the wheel piece in the copy puzzle.)

Excerpt 5

(20) M: (C is holding a wheel piece in is hand) *Is that a circle?*

(21) M: *Look at this.*

(22) C: *Look. Circle.*

(23) M: *And there's a circle on the outside and a circle on the inside.* (M points to the wheel piece in the C's hand.)

Excerpt 6

(24) M: (C has an inner wheel piece in his hand) *Where does that go?*

(25) M: *Do yo think that would fit inside this circle?* M points to an outer wheel piece in the copy puzzle.)

Excerpt 7

(26) M: (C has picked up the two black inner circle pieces from the pieces and is holding them in his hands) *There's two. Two black circles.*

(27) M: *Can... I think they are the inside of the wheels.* (M points to the outer wheel pieces which have already been inserted into the copy puzzle) *Can yo put them in there?* (C inserts the inner wheel pieces correctly in the copy puzzle.)

Of course by selecting only those segments of discourse in which the mother referred to a wheel piece, we have ignored several other aspects of the interaction that would have to be taken into account in any complete analysis. However, this partial record of the discourse reveals some important facts about the degree and quality of intersubjectivity that was attained during this joint cognitive activity. A cursory examination of the excerpts reveals that the child was not very suc-

cessful at «transcending his private world». He apparently never understood that the pieces represented various parts of a truck. It seems that throughout the interaction he viewed the pieces as circles or crackers rather than as wheels.

In actuality, one could complete this task successfully without realizing that the puzzle represents a truck (one could assume that it was simply a complex, but meaningless, two dimensional design). However, the natural (i.e., culturally appropriate) way for the mother to approach the task was in terms of a representational object. Hence this was part of the situation definition into which she, as a more experienced member of the culture, tried to «lure» her child.

Because of the child's constant inability or unwillingness to «buy into» a situation definition which would be more appropriate for carrying out this culturally defined task, the adult was forced to adjust her communicative moves such that they could be interpreted within his alternative framework. One of the semiotic mechanisms that made it possible for the mother to interact with her child within the confines of his situation definition was referential perspective. In order to see how she did this, let us turn to a closer analysis of the verbal and nonverbal referring expressions used by the adult to refer to the wheel pieces. These are listed below by episode.

Excerpt 1
  4a: They
  8a: They
  8b: They
  8c: They
11a: The wheels
11b: M points to the wheel pieces in the model puzzle
13a: The wheels

Excerpt 2
15a: There
16a: This
16b: The wheels

Excerpt 3
17a: This

Excerpt 4
18a: It
19a: It

Excerpt 6
20a: That
21a: This
23a: a circle
23b: a circle
23c: M points to the wheel piece in the C' hand

Excerpt 6
24a: That
25a: That
25b: This circle
25c: M points to an outer wheel piece in the copy puzzle

Excerpt 7
26a: There
26c: Two black circles
27a: They
27b: The wheels
27c: M points to the outer wheel pieces which have already been inserted into the copy puzzle
27d: Them

In all, the mother used 28 referring expressions. Her interaction was marked by the use of several different referential perspectives. She used four context informative referring expressions (11a, 13a, 16b, 27b), four common referring expressions (23a, 23b, 25b, 26b), and twenty deictic referring expressions (4a, 8a, 8b, 8c, 11b, 15a, 16a, 17a, 18a, 19a, 20a, 21a, 23c, 24a, 25a, 25c, 26a, 27a, 27c, 27d). Of the twenty deictic referring expressions, four (11b, 23c, 25c, 27c) were instances of nonverbal pointing and the remaining sixteen involved verbal expressions such as «they», «this», and «it».

As is often the case when analyzing interaction, by examining patterns and sequences fo communicative moves we can say more than we could if we restricted ourselves to frequency counts. In the interaction we are examining, the pattern of the mother's choice of referring expressions provides some insight into the problems the dyad was having in establishing a temporarily shared social reality.

This problem is obvious from the beginning of the interaction. In Excerpt 1 (which occurred at the very beginning of the session), we see that the child understood or defined the wheel pieces in terms of «crackerness» rather than «wheelness» (e.g., utterances 3, 5, 7). The mother attempted to impose a different situation definition on the task setting, both by arguing that the wheel pieces were not really crackers (utterance 8) and by introducing context informative referential perspectives based on wheels (utterances 11 and 13) and trucks (utterances 8, 10, 12, 13). Note, however, that even as she was introducing these appropriate referential perspectives into the speech situation, she «hedged her bets» by relying on extensive use of nonverbal pointing. Thus in all cases except on (utterance 13) in Excerpt 1, the mother accompanied her context informative referring expressions (having to do with a truck or a wheel) with a nonverbal pointing behavior. In the only instance where she did not supplement her context informative referring expression with deixis (utterance 13), the child's response (utterance 14) was inappropriate.

Thus in those cases when the child shifted his attention to the appropriate aspects of the task setting, he could have been doing so either

because he was categorizing the objects as the adult was or because he was simply following the minimally informative deictic referring expresion. If he were acting on the basis of the former, he would be accepting the adult's situation definition and «transcending his private world». If he were acting on the basis of the latter, he would be entering into only a minimal level of intersubjectivity. That is, he would be attending to the same referent but from a different perspective than that used by the adult.

The subsequent excerpts indicate that this child was attending to the referents for the second reason. In Excerpt 2 the mother again introduced a context informative referential perspective concerned with wheels, but she again accompanied these with deictic referring expression («this» in 16). Furthermore, it is important to note that in this excerpt the child was already attending to the intended referent before the mother referred to it. Therefore, it is difficult to ascertain wether the child appreciated the context informative referential perspective that the mother introduced by the expression «the wheels».

By Excerpt 3, the mother had switched entirely to using verbal and nonverbal deixis when identifying the intended referent. This pattern continued in Excerpt 4.

In Excerpt 5, the mother introduced another referential perspective by asking the child whether the object he was holding was «a circle» (utterance 20). He responded by defining the wheel piece as a circle in utterance 22. That is, he «bought» this referential perspective. This is a common referring expression and still represents a default option because it is not closely tied to the specific situation definition (i.e., building a *truck* puzzle which has *wheels*). As we discussed earlier, this is a referring expression that someone would be likely to choose with no information about the situation definition in which the referent appeared. However, in our present case the mother and child were able to agree that the intended referents were circles, so it now was possible to continue their joint cognitive activity by using deictic, *and* referring expression.

As we noted earlier in section II, the introduction of a common referential perspective is «misleading» in a certain sense. In the case under discussion here (in Excerpt 5), it is misleading in the sense that it would be more appropriate to think of the intended referents as wheels rather than circles when one is making a truck puzzle. However, we have an instance here where the speaker was temporarily suspending the most appropriate referential perspective and relying on a default option because her main concern was to «get the referring job done». It seems that she was willing to label the intended referent in any way required to agree with the child's understanding of the objects in the task setting.

In Excerpt 6 the mother continued to use a referential perspective based on circles. Even in this case where the child seemed to agree that the referents could be defined as circles, however, it is interesting to note that the mother supplemented her common referring expressions with verbal (24a, 25a) and nonverbal (25c) deictic referring expressions. Because of this support from deixis we cannot be certain

about the degree to which the child had redefined the wheel pieces even as circles.

Finally, in Excerpt 7 we see that the mother re-introduced the context informative referential perspective based on wheels (27b). It is interesting to consider the possible reasons for her doing so at this point. Re-introducing this referential perspective at this stage of the interaction may appear to be counterintuitive. After all, the introduction of this perspective seemingly had little effect earlier, and the mother had supplemented even common referring expression with deictic referring expressions. Thus the most straightforward and efficient communicative strategy at this point would appear to have been to continue relying solely on common and deictic referential perspectives. This pattern of re-introducing context informative referring expressions after an initial lack of success (and the associated switch to default options) characterizes the interaction of several of the mothers we have studied. It often appeared to be an effort to retest the child's situation definition to determine whether he/she was capable of redefining the objects in the communicative setting in a task appropriate way. In the case examined here, it seems that this test did not meet with success. The child continued to display behaviors which indicated that he was not categorizing the objects as wheels. For example, at a later point in the interaction, after continuing to refer to other pieces as crackers he tried to eat them.

We can summarize the excerpts of interaction between this 2 1/2-year-old and his mother as follows. The mother and the child did not understand the task setting and the pieces of the puzzle in the same way. After initial attempts to introduce a context informative referential perspective based on the functional significance of pieces in a perceptual array depicting a truck, the mother switched to communicative moves that did not require this situation definition. One of the ways that she did this was to switch from context informative referring expressions to common and deictic referring expressions (i.e., default options). While she undoubtedly continued to understand that the puzzle depicted a truck, she ceased (at least temporarily) introducing referential perspectives which were invitations to the child to use the same situacion definition. One could argue that she never really required the child to interpret her utterances strictly on the basis of a situation definition based on a truck since she supplemented virtually all of her context informative referring expressions wiht deictic referring expressions.

In contrast to these problems that this 2 1/2-years-old had in transcending his private world, children in our task often are capable of entering into a level of intersubjectivity that permitted productive joint cognitive activity. As an illustration of this let us now turn briefly to an excerpt of two interaction between a 3 1/2-year-old boy and his mother in this same task setting. As we did earlier, we shall report only those segments of interaction in which the mother referred to the wheel pieces. In this cases, only one excerpt is involved.

Excerpt 8
(28) M: (C is looking at the pieces pile) *Now we have to find the wheels.* (C looks at the model puzzle, C picks up an outer wheel piece, C looks at the piece in his hand, C looks at M.)
(29) M: *That goes along the center. That's right.* (C inserts the outer wheel piece correctly in the copy puzzle, C picks up the inner wheel piece from the pieces pile, C looks at the copy puzzle, C inserts the inner wheel piece correctly in the copy puzzle.

A short time after this excerpt the child selected the other outer wheel and inner wheel pieces and inserted them correctly in the copy puzzle without any further assistance from the mother.

In this case we see that the child seemed to realize immediately which pieces were wheels. He responded appropriately to the mother's initial introduction of a context informative referential perspective based on «wheelness» (utterance 28). Although she did use a deictic referring expression in utterance 29, the initial success at agreeing on referential perspective indicates that the switch was not motivated by a need to operate on the basis of a more primitive situation definition. Thus in this case the deictic referring expression was not functioning as a default option. Unlike the 2 1/2-year-old, this 3 1/2-year-old child quickly and smoothly entered into a state of intersubjectivity with his mother (at least in connection with defining the puzzle as a truck), and the mother did not find it necessary to switch referential perspectives in an attempt to arrive at some shared situation definition.

To summarize, in this section we have examined two cases of joint cognitive activity involving adult-child dyads. These cases differed greatly with respect to the level of intersubjectivity attained. The major point for carrying out this examination has been to demonstrate that when confronted with a lack of intersubjectivity in such interactional settings, the adult can utilize options in referential perspective to establish and maintain communication. Thus our analysis in this section can be viewed as an expansion on the reasons provided by Olson and Rommetveit for utilizing one referential perspective rather than another.

IV. SOME SPECULATIONS ON THE GENERAL PROBLEM OF REFERENTIAL PERSPECTIVE AND JOINT COGNITIVE ACTIVITY

Up to this point we have been primarily concerned with the semiotic devices that make joint cognitive activity possible. This has involved a general outline of the options available and an illustration of how they are manifested in adult-child interaction. In this final section we shall explore a more general problem in connection with the issue of what factors influence the choice of semiotic devices such as referential perspective. This will involve some speculation on how in-

terlocutors' basic assumptions about one another's competence and status influence communicative paterns.

We begin by recognizing that some readers may ask whether there is not an important difference between the creative conflict we mentioned earlier when examining adult-adult interaction and the kinds of communicative problems that arose in the interaction between the mother and her 2 1/2-years-old-child. In response to this we would first point out that communicative problems arose in both cases in connection with the fact that the interlocutors did not agree on how certain objects in the task setting were to be defined. That is, we would point out that there are similarities between the two cases.

However, the question about how the two cases are different leads us to a distinction between what we shall term «symmetrical» and «asymmetrical» settings in joint cognitive activity. When we speak of a symmetrical interaction setting we have in mind a situation in which both interlocutors are assumed to be equally capable of defining the task setting in a culturally appropriate way. When we speak of asymmetrical setting we have in mind those cases where one of the interlocutors is assumed to be primarily responsible for defining the task setting appropriately and for monitoring the group's activities. Symmetrical settings typically occur when peers with an equal level of understanding of a task work together. Perhaps the best examples of asymmetrical settings are instructional situations and situations where an adult helps a child carry out some task which is too difficult for the child. In actuality, it is often quite difficult to distinguish instructional from «helping» situations. That is because instruction often involves a heavy element of joint problem solving, and whether intended or not, joint cognitive activity usually has pedagogical results.

Whenever interlocutors enter into joint cognitive activity, they must decide who is primarily responsible for guiding the joint effort. We recognize that this is an important and much investigated problem in social psychology. Our purpose here is not to attempt to clarify issues in this area of group dynamics and leadership. Rather, our intent is to examine this issue from the perspective of how it enters into an analysis of the semiotic issues we have been discussing.

For an example of joint cognitive activity in a relatively symmetrical setting we can return to Lomov's study. In that study it was assumed that both interlocutors had roughly equal rights and responsabilities for defining the task and regulating the joint cognitive activity. Lomov pointed out that in fact, one of the participants seemed to play a larger role than the other in guiding the task effort to its conclusion. For our purposes, however, the important point about this speech situation is that both of the interlocutors understood the task parameters and the general nature of the objects involved. Furthermore, they understood that they both had equal rights and responsibilities for planning and monitoring the joint cognitive activity. As we saw, there were still differences within this general shared situation definition with regard to the specific ways that one should think of the objects under consideration (in this case, buildings and streets at a particular intersection in Leningrad). It was these differences that

gave rise to the creative conflict which characterized the interaction.

Of course much more research needs to be carried out in order to develop this account of joint cognitive activity in a symmetrical setting into a meaningful and valuable analysis. However, it does allow us to point out a couple of important facts about such settings. First, it reflects the fact that in such settings interlocutors assume that the final version of the situation definition will emerge out of a process of mutual negotiation. It is not assumed that one of the interlocutors «has all the right answers». Second, this process of mutual negotiation is possible in part because of the options provided by semiotic mechanisms suchs as referential perspective. The issue of perspective emerges in a different way in this case than in the adult-child interaction because in Lomov's study there was a higher initial level of shared understanding of the referents involved. Thus while the interlocutors agreed that they were speaking about the Admiralty (i.e., they attained a relatively high level of intersubjectivity in some respects). However, they did not reach and maintain agreement on the precise way to view this referent. The fact (noted by Lomov) that nonverbal gestures played an important role in the joint cognitive activity suggests that even with this relatively high level of intersubjectivity, default options may have been playing and important function.

In cases of joint cognitive activity involving asymmetrical settings, matters can be quite different. In these cases there is an assumption on the part of one or both interlocutors that only one of the participants has the competence and the responsibility to define the objects and goals in the task setting and to monitor the group's activity such that it will lead towards the goal. This was clearly the case with the mother-child dyads we examined earlier. Although there was no specific mention of this assumption in the interaction, it played a role in how the joint cognitive activity proceeded. Even in the case of the interaction involving the 2 1/2-year-old where it seemed that the child was oblivious to how the mother was trying to define the objects in the task setting, there was clearly a shared assumption that one interlocutor (the adult) had the right and the responsibility to try to define the task setting and monitor the joint activity in accordance with this definition. This is not to say that the child had no influence on the mother. It is to say, however, that the mother was the one who had primary responsibility for managing the overall joint performance. Given this rough distinction between symmetric and asymmetric settings in joint cognitive activity, let us now return to our main concern —the role of various semiotic mechanisms in this activity. Our comments here will be primarily concerned with adult-child asymmetric joint cognitive activity since this has been the primary focus of our own research. However, we shall also speculate briefly on how the use of referential perspective in this type of activity contrasts with that in symmetric settings.

Recall that in the excerpts of adult-child interaction involving the 2 1/2-year-old, the mother began by using context informative referring expressions and then switched to using common and deictic referring expressions (i.e., default options). While we did not dwell on

it at the time the mother's reason for making this switch is obvious. Her reasons was *not* that she became convinced that it was indeed more appropriate to categorize the objects as circles or as «that one» instead of wheels. Although she temporarily suspended her practice of introducing the referential perspective based on «wheelness», she obviously still believed that the intended referents could be categorized most appropriately on that basis.

If this is true, what motivated her to switch to the less informative default options? The answer lies in the fact that she was experiencing difficulty in attaining an adequate level of intersubjectivity when she attempted to rely exclusively on a context informative referential perspective (i.e., when she relied on a referential perspective that was interpretable only within her sophisticated situation definition). She could be more certain of «reaching» her child (i.e., of establishing some degree of intersubjectivity by referring to the wheel pieces with common and deictic referring expressions. Her attempt to establish intersubjectivity by introducing the notion of a circle in Excerpt 5 is perhaps the best example of this. She apparently introduced «circleness» as a referential perspective in order to discern whether it would be possible to establish intersubjectivity on that basis. Unlike «wheelness», «circleness» worked, so she continued to use it. However, once again this does not mean that she changed her opinion about what the referent «really» was in this task setting. This is evidenced by her reintroduction of a referential perspective bases on «wheelness» in Excerpt 7.

This pattern of using referential perspectives reflects the fact that the type of negotiation in such asymmetrical settings is often different than that we could expect in symmetrical settings. Specifically, we see that in our case the mother's categorization of the objects as wheels was really not open to negotiation in the sense that she might be prepared to give it up permanently. There was really no movement on her part toward becoming convinced that another way of understanding the object in that task setting was more appropriate. Her reason for switching to default options was based solely on short range concerns with communicative efficiency.

The differences between the types of negotiation that one is likely to find in symmetrical and asymmetrical settings add another elements of complexity to our analysis of referential perspective. It reminds us that there is not a one-to-one correlation between use of referential perspective and the interlocutors' understanding of an object. Thus, in symmetrical settings an interlocutor may be willing to suspend his/her preferred context informative referential perspective in order to arrive at a new understanding of the speech situation and of objects in it. This may not guarantee complete agreement on definition, but an elements of genuine negotiation is involved here in the sense that the interlocutors are willing to «look at things form another's viewpoint» and to accept that viewpoint if it seems more appropriate. This genuine negotiation is possible in part because flexibility in referential perspective allows each party to identify referents without imposing a context informative perspective on the speech situation.

In asymmetrical settings this genuine negotiation often does not take place. Although the more competent interlocutor may suspend his/her practice of introducing a particular context informative referential perspective, this does not indicate that he/she is in the process of negotiating his/her understanding of referents and the situation definition. It simply reflects the fact that he/she is willing to forego the use of a particular referential perspective temporarily in order to pursue his/her immediate communicative and regulative goals. Thus we see that a switch from context informative referential perspective to default options can serve a different function in symmetrical and asymmetrical settings.

As we mentioned earlier, our account of referential perspective should not be taken as an exhaustive semiotic analysis. By the same token, our outline of social psychological phenomena such as symmetrical and asymmetrical joint activity settings should not be interpreted as an attempt to deal with psychological issues with a high level of sophistication. Our main purpose has been to demonstrate that analysis of joint cognitive activity will benefit from increased attention to the specific semiotic mechanisms that make it possible. Without such analyses of semiotic options and of interlocutors strategies for using them, our accounts of joint cognitive activity will remain at such a general level that misintrepetations and false contradictions will make scientific progress very difficult.

Notes

¹ The specific data and analyses to be presented in this paper involve dyadic social interaction. Therefore, when we speak of «social groups», «joint activity», etc., we shall have the dyadic setting in mind. In all cases, our argument extends in principle to larger groups.

² We make this point about sign tokens in order to emphazise that our analysis contrasts with approaches which take sign *types* as their object of study. Approaches which focus on sign types deal with issues such as sense (the relationship among sign types or between sign types and meaning components). We are here employing the distinction between sense, denotation and referent that Lyons (1977) has proposed.

³ We are here using the term «referring expression» in connection with nonverbal as well as communicative devices. Thus a nonverbal pointing behavior is counted as a type of expression. We recognize that there are objections one could raise about this terminology, but it seems to be the most useful and efficient alternative for our present purposes.

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Resumen extenso

Este artículo examina algunos de los procesos comunicativos de tipo semiótico o psicológico involucrados en la realización de actividades cognitivas conjuntas. Comienza con la revisión de ciertos problemas que plantea la creación y mantenimiento de la llamada «intersubjetividad», problemas sugeridos previamente por autores como Rommetveit y Lomov, para luego efectuar un análisis en profundidad de la noción de «perspectiva referencial».

La perspectiva referencial es la perspectiva específica desde la cual se identifica un referente determinado en el seno de un acto comunicativo (fundamentalmente lingüístico). La necesidad de examinarla en detalle se justifica por el hecho de que uno y el mismo objeto (referente) puede ser identificado de diversas formas en la comunicación, excluyendo de ese modo un sinfín de relaciones biunívocas entre la expresión referencial y el objeto identificado.

El análisis alude a tres tipos distintos de perspectivas referenciales. El primero, las expresiones referenciales deícticas, abarca varios tipos específicos de signos indicadores, como los bosquejados por los semiólogos en la tradición de Peirce. Al emplear tales expresiones, un interlocutor echa mano de un mínimo de información compartida con quien lo escucha. El segundo, las «expresiones referenciales comunes», reflejan la denominación más corriente que se confiere a un determinado objeto en el habla de una comunidad y se basan en la función que habitualmente cumple ese objeto. La noción de expresión referencial común se deriva en términos teóricos del análisis que Brown propone acerca de la denominación que ha de otorgarse a un objeto determinado. Y, como sucede con las deícticas, el uso de expresiones referenciales comunes minimiza la cantidad de información introducida en el escenario a través de la acción comunicativa. En el caso de las expresiones referenciales comunes, la redundancia surge no porque la información está disponible en la organización espacio-temporal de los acontecimientos en el discurso, sino porque este género de expresiones referenciales es el que los oyentes escogerían típicamente si hubieran de hacer dicha elección sin contar con ninguna información respecto a un intercambio comunicativo.

En contraposición a los dos primeros tipos de expresiones referenciales, las «informaciones del contexto» introducen una dosis máxima de información en el escenario comunicativo, ello porque la perspectiva en que se fundan es evidente tan sólo para quien haya participado antes en ese mismo escenario. El uso de expresiones referenciales informativas del contexto invita a los oyentes a categorizar los objetos y acontecimientos basándose en la información derivada del escenario comunicativo en juego, aquél donde se plantea la solución del problema.

Tras pasar revista a estos tres tipos de perspectivas referenciales, el artículo aborda algunos de los motivos que justifican el uso de unas u otras en escenarios comunicativos concretos. Una de tales razones, que ha sido ya detectada e identificada en la investigación escrita de que disponemos, es la de deslindar un referente intencional de objetos alternativos en la situación del habla. Para lograrlo, los hablantes han de seleccionar, a menudo, ciertas expresiones referenciales que no sólo permiten identificar correctamente el referente deseado sino que además excluyen otras posibilidades. Un segundo motivo tiene que ver con el afán del hablante de facilitar las existencias perceptuales y atencionales del oyente. El hablante suele recurrir a diferentes expresiones referenciales con este propósito, aun cuando el campo referencial se mantenga constante.

La segunda de las razones aducidas para utilizar una perspectiva referencial específica y no otras, plantea algunas interrogantes adicionales acerca de los motivos que puede tener un hablante para querer simplificar las exigencias perceptuales y atencionales del oyente. El artículo trata esta cuestión examinando fragmentos de interacción adulto-niño en un escenario donde se plantea la resolución de un problema. En tales situaciones, los interlocutores han de desarrollar, con suma frecuencia, mayores esfuerzos para establecer y mantener la situación de intersubjetividad, pues su comprensión inicial de la tarea en ciernes es distinta. Se comprobó que la flexibilidad del adulto para utilizar varios tipos de perspectivas referenciales estaba íntimamente ligada a la interpretación infantil de los objetos y comportamientos involucrados en el escenario donde se efectuaba la tarea. En los términos del enfoque vygotskiano, esto viene a reforzar el papel de la flexibilidad en el plano interpsicológico, como un factor capaz de promover el máximo desarrollo en el plano intrapsicológico.