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Grammatical Devices for Sharing Point

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Certain linguistic devices play a central role in facilitating the exchange of thoughts between the speaker and the listener in natural communication. These devices are designed to control the ebb and flow of knowledge, belief, narration, and assertion during both planned and unplanned discourse. The collection of such devices constitutes what I call the "point-sharing system." From the speaker's point of view, the function of point sharing is realized through point making, because each attempt by the speaker to share his thoughts with his listener involves the making of a "point." From the listener's point of view, the function of point sharing is realized through point using, because the listener takes the points that have been presented by the speaker and uses them to alter his own cognitive structures. When we wish to speak about both point making and point using, we can talk about the overall function of point sharing.

In other papers, Elizabeth Bates and I have examined the development of point sharing in children (Bates and MacWhinney, 1979) and the theoretical place of functionalist grammar within modern-day psy-cholinguistics (Bates and MacWhinney, 1982a). We have also reported data on children's acquisition of point-sharing devices in English, Hungarian, and Italian (MacWhinney and Bates, 1978; MacWhinney and Price, 1980) and the use of these devices by adults in sentence comprehension (Bates and MacWhinney, 1982b; Bates et al., 1982). In the present chapter, I would like to focus attention on specific devices from the point-shaj ing system and the ways in which these devices convey instructions to a listener that guide him in elaborating his cognitive representations.

The analysis of these devices is guided by the functionalist approach to semantics—an approach that is summarized in Bolinger's (1972) observation that "when we say two things that are different we mean two different things by them." According to the functionalist perspective, differences in word order, article use, ellipsis, and so on are not arbitrary formal facts. Rather, they reflect fundamental differences in the kinds of points the speaker is trying to make. This chapter shows how both children and adults use different devices from the point-sharing system to convey different instructions to a listener.

SEMANTIC ANALYSIS

English is an extremely thrifty language. Rather than creating a new word for every new meaning or shade of meaning, our language tends to make the most of the old words already in the dictionary. For example, the word *blow* has scores of different entries in the lexicon. A person can "suffer a blow," "blow off steam," "blow balloons," "blow his last chance," "blow into town," and so forth. Many common English words have dozens of these alternative minor readings. When some thread of commonality runs through the whole series, we can say that the alternative readings

are *polysemes* of a single lexical item (MacWhinney, 1982) and the rules that tell us which poly seme to pick in a given case can be called *polysemic* rules. In the next 12 sections, the polysemic structure of 12 of the most important devices of the point-sharing system are discussed: the definite article, the indefinite article, pronominalization, ellipsis, relativization, stress, initialization, pre-verbal positioning, subject-verb agreement, verb selection, case-marking, and particle use. Data on the use of these devices by both children and adults are examined, and the final sections of the chapter show how, by their very nature, these various devices place clear limitations on the shape of the information-processing system we use to interpret the instructions. Finally, the implications of this analysis for the study of normal and abnormal language development are considered. Because many of the data that are currently available on the various devices of the point-sharing system derive from experimental studies of either sentences in isolation or short strings of sentences, little is said about some of the more elaborate uses of devices that come into play only in longer textual structures.

Definite Article

The definite article *the* has a variety of meanings or polysemes. These polysemes are similar to each other in some ways, but different in others. They share as a common core the instruction to the listener that it is possible to compute a unique referent for the following noun (i.e., that a referent is "presupposed" or "given"). Exactly how that referent is to be computed, however, depends on the poly seme being used. There are seven different ways in which to compute a referent for a noun with a definite article: computation through exophora, anaphora, cataphora, paraphrase, partonymy, set operation, and gener-icalness. Whichever of these seven polysemes the listener selects as appropriate, the end result must be identification of a unique referent. In other words, all of the readings of the definite article share the semantic feature of computability of a referent. However, polysemes differ from each other in terms of the exact way in which the referent is computed.

Exophora   The first way of establishing the referent of a definite article is through exophoric deixis *(exophora,* from Greek *exo* "out"+ *pherein* "carry," i.e., referring outside of the text). Information that is exophorically given is concretely available in the physical-perceptual situation even though it has not been mentioned verbally. As Clark and Marshall (1981) argued, reference can be achieved when there is a physical copresence of the speaker, the hearer, and the object being identified. For example, when ordering dessert pastries from a tray at a restaurant, one can say "I'd like the Sacher torte." In such a case, the identity of the referent (in this case "the Sacher torte") is exophorically given. Brown and Levinson (1978) noted that, by emphasizing his physical copresence with the listener and the object being mentioned, the speaker may also succeed in establishing a polite, cohesive social bond with the listener. For example, a visitor may enter an acquaintance's house for the first time and exclaim "Oh, this is lovely!"

Another common example of exophoric givenness occurs in the case of personal pronouns (Silverstein, 1976). For example, when we use the pronoun /, the referent is always the speaker. Also, the referents for the pronouns *we* and *you* may be situationally clear in many cases, but *he, she, it,* and *they* are far less likely to be exophorically given.

The act of referring to something exophorically is essentially the verbal counterpart of pointing. When we point, we are saying something like "Look at that!" Extending this analogy between gesture and speech, Lyons (1975) has argued that exophoric deixis, or pointing, provides a conceptual basis for givenness in general. This viewpoint seems intuitively satisfying because even nonexophoric givenness can be seen as directing the listener to attend to something he will find in his mind if he only looks hard enough.

Studies by Bresson (1974), Maratsos (1976), and Warden (1976) showed that children are particularly likely to overgeneralize the exophoric use of articles. In cases where the listener is blindfolded or otherwise unable to infer the referent, children may treat that referent as given when an

adult would not. Moreover, MacWhinney and Bates (1978) and Warden (1976) found that, even among adults, there is a high level of exophoric use of the definite article. In such experiments, adults often correctly infer that the experimenter must have previous knowledge of the referents for the experimental stimuli. Given this presumed omniscience of the experimenter, it is often quite difficult to exclude exophoric use of the definite article.

Anaphora The second way of establishing the referent of a definite article is through anaphoric mention. Material that has been mentioned in previous discourse is anaphorically given *(ana* "back" + *pherein* "carry," i.e., referring back to earlier text). In other words, when an item is anaphorically given, the listener can identify the referent of the item simply by going back and finding the last mention of that referent in his working memory for the conversation. For example, if one speaker talks about "a dog named Clyde," the next speaker can simply refer to Clyde as "the dog" and still feel confident that all his listeners know to whom he is referring.

Haviland and Clark (1974) and Yekovich, Walker, and Blackman (1979) have shown that sentences with a definite article are easier to understand if the attached noun phrase can be matched to an anaphorically given referent. Fortunately for their listeners, speakers make frequent use of definite noun phrases with anaphorically given referents (Grieve, 1973; Osgood, 1971). Moreover, anaphoric use of the definite article is not confined to adults. Maratsos (1976) found that American children as young as 3 years old make correct use of the definite article to mark referents that are uniquely given in previous discourse. However, Karmiloff-Smith (1979) has noted that, when given a situation in which either an anaphoric or an exophoric interpretation of the definite article is possible in French, preschoolers prefer the exophoric interpretation.

Cataphora The third way of establishing givenness is through "backward anaphora" or "cataphora" *(cata* "below" + *pherein* "carry," i.e., referring to material that occurs below in the text). Material that can only be identified by referring to information in subsequent discourse is cataphorically given. In the sentence "The girl he was to marry jilted John" the phrase "the girl" is identified by material that follows it, i.e., by the phrase "he was to marry." At the same time, the word "he" is identified by the word "John," which follows it. Cataphoric givenness also occurs in phrases such as "the number seven" or "the country of Bolivia." These cases of cataphoric identification are what Donnellan (1966) calls the "attributional" use of definite reference, because the item is being identified by the following attribution.

Paraphrase A fourth way of establishing the referent of a definite article is by paraphrase. In anaphoric reference, there is a previous noun in the text that has the same lexical form as the current noun. However, it may also happen that the previous noun is actually a paraphrase of the current noun. Consider these examples based on Hawkins (1977):

1. Ed was standing by the drill press when suddenly the machine began to vibrate.

2. A man and a woman were walking down the alleyway. The couple was speaking Portuguese,

Sentences 1 and 2 involve the minimal type of inference known as paraphrase. Paraphrase makes use of the fact that lexical items have associations that specify their class membership. For example, in our lexical frame for a *drill press,* we have presumably stored the information that a drill press is a *machine.* Thus, activation of the *drill press* frame also partially activates the association that leads to the *machine* frame. In sentence 2, the inference works the other way, but again nothing more is involved than simple paraphrase. A subcase of paraphrase is the use of the definite article in phrases such as *John, the fool* where "John" is being identified as a fool.

Garrod and Sanford (1977, 1978) investigated the comprehension of sequences such as Examples 3 to 6, below. Some of the sequences involve the substitution of a superordinate for a subordinate

term (i.e., a bus can be referred to as "a vehicle"), whereas others involve the use of a subordinate for a superordinate term (i.e., one type of vehicle is "a bus").

3. A tank came trundling down the hill. The vehicle almost hit a pedestrian.

4. A bus came trundling down the hill, The vehicle almost hit a pedestrian.

5. A vehicle came trundling down the hill,. The bus almost hit a pedestrian.

6. Mrs. Dupont yelled at the bus. The vehicle almost hit a pedestrian.

Garrod and Sanford found that readers were quicker to understand sentence 4b than sentence 3b and that both of these were faster than sentence 5b. On the basis of these and other data, they argued that, when readers encounter an item like "a bus," that item generates an expectation for its paraphrase "vehicle." The word "tank" also generates an expectation for "vehicle," but because a bus is better than a tank as an instance of a vehicle (Rosch, 1977), the word "bus" generates a stronger expectation for "vehicle." This explains why subjects were quicker to understand sentence 4b than sentence 3b. Conversely, the word "vehicle" generates expectations for buses and tanks and so on, but these are weaker than the paraphrase use of vehicle generated by either bus or tank. As a result, subjects took significantly more time in sentence 5b than in 4b figuring out the referent of the "bus."

Garrod and Sanford also found that subjects' reading of sentence 6b was slower than their reading of sentence 4b. They took this as evidence that the *bus* frame in sentences like 6a is not activated in the same way as it is in sentences like 4a and that frames are activated more strongly for topics than for comments. However, if by "topic" they mean "the principal theme of the discourse," this cannot be strictly true because both sentences 4a and 6a occur at the beginning of the discourse. It seems more likely that the superior frame activation in 4 is due to the fact that "a bus" is the "perspective" of sentence 4a and this perspective is maintained in sentence 4b. (The notion of a "perspective" is discussed in the section on subject-verb agreement below.)

Partonymy A fifth, somewhat more complex way of establishing the referent of a definite article is by partonymy. This way of computing givenness views a current referent as a unique part or piece of some large referent or frame already under discussion. For example, Linde and Labov (1975) have shown that, when describing apartment layouts, adults regularly use definite articles to refer to major rooms whenever there is typically only one such room per apartment. Thus, they speak about "the living room" or "the kitchen." In effect, they are assuming that every *apartment* has one *kitchen*. Speakers do this even when they have not yet mentioned the room in a previous sentence and when it is not exophorically given. In such cases, speakers assume that listeners realize that the referent is unique.

Sentences 7 to 9 provide further examples of definiteness by partonymy:

7. Bill swore. The oath embarrassed his mother.

8. Mary traveled to Munich. The journey was long and tiring.

9. Bill found a prewar German novel in the Goodwill bin. Soon he discovered that some of the pages were uncut, that the author was a racist, and the content was offensive.

In sentence 7, the use of "swearing" evokes a frame that includes the execution of an "oath." Similarly, in sentence 8 the lexical frame for "traveling" presupposes a "journey"; and in sentence 9 a "book" must have "pages," an "author," and "content."

Partonymic relations extend quite pervasively throughout the lexicon. When discussing "the body" in physiology, we can also refer definitely on first mention to "the kidney," "the blood," "the lymph nodes," "the medulla oblongata," and so forth. In astronomy, we have "the sun," "the asteroid belt," "the corolla," "the Doppler shift," and so on. The importance of such systems

in determining definite reference has prompted Clark and Marshall (1981) to think of definite reference as being computed out of an encyclopedia organized in a way that allows all information relevant to a given social group to be stored together. Thus astronomers, physicians, Palo Alto homeowners, or Pittsburgh school bus drivers would all have direct access to certain types of definite reference by partonymy by virtue of their active role as participants in a social group.

Sanford and Garrod (1979) have examined the role of partonymic associations in sequences like 10 and 11.

10. Mary was dressing the baby. The clothes were made of soft pink wool.

11. Mary was putting the clothes on the baby, The clothes were made of soft pink wool.

Using a self-paced reading paradigm, Sanford and Garrod found that subjects took no longer to read sentence lOb than they did to read sentence lib. From this, they concluded that the lexical frame for *dressing* generates a presupposition for *clothes,* and that information that is presupposed in this way is just as available as information that is overtly stated.

Keenan and Kintsch (1974) gave subjects sentence pairs that contained even greater inferential leaps, supported by even weaker presuppositions. A typical sequence in their experiment on the comprehension of sentences related by partonymy is:

12. Gas leaked from a butane tank. The explosion leveled a nearby service station and a new home.

13. The gas leak caused the explosion.

In order to understand example 12, subjects may have relied on some weak expectations for "explosion" generated by "gas." However, these expectations were apparently quite weak. When subjects were asked immediately whether sentence 13 fit the meaning of what they had read, they were slow in making this decision if they had not actually read 13. However, after a 15-minute delay, subjects who had not read sentence 13 made this judgment just as quickly as those who had read it, indicating that both groups had "made the inference" by that point.

These studies indicate that identification of definite noun phrases relies heavily on expectations generated by earlier items. If these expectations are strong and if they match the current item, identification is strongly facilitated. If the expectations are weak, identification will take longer and other factors may come into play. Note that the most general case of definite reference is reference by partonymy. Reference by paraphrase can be viewed as a subtype of reference by partonymy in the sense that some of the associations included in the frame for a lexical item are paraphrases of that item. In a similar vein, one could view anaphoric reference as a subtype of paraphrase in which the two items just happen to be lexically identical.

Set Operation A sixth way of establishing the referent of a definite article is through the specification of an operation on a set such that the operation is guaranteed to yield a unique item. For example, if we are talking about a row of birds on a power line, we may speak about "the first," "the last," "the biggest," "the middle one," "the second from the end," or "the yellow one." In each case we specify some characteristic that allows us to operate on the set of birds to achieve unique identification. Note that certain characteristics apply by definition. If there is a line of birds, then by definition there must be one that is "the first." However, there may not always be a "yellow one." Therefore, we can distinguish two types of givenness by set operation: givenness that applies by definition and givenness that applies by assertion.

Assertion is important in the establishment of a referent for the definite noun phrases in all of the following sentences except 16:

14. Do not feed the llamas.

15. *Speaker A:*   Can you recommend a good mechanic?
    Speaker B: I take the Mercedes to Dieter Neckritz.

16. Returning from his success in the Middle East, Carter was con fronted by an unruly and vindictive Congress.

17. Returning from his success in the Middle East, Carter was con fronted by the unruly and vindictive Congress.

18. Mary didn't know which marble to choose. Finally, she took the red one.

Sentence 14 could represent a sign posted on a fence. The fact that no llamas are visible really does not matter; their presence is being asserted by the sign itself. Note that a set operation is still involved here. A variety of other animals—including antelopes, peacocks, turtles, and giraffes—may be located behind the fence. The sign states only that one should not feed the llamas. In example 15, Speaker A may not have told the listener about his new Mercedes; but that does not matter. All Speaker B cares about is that Speaker A should know about it now. He achieves this effect by simply asserting its existence. This type of assertion of knowledge not necessarily known to the listener is often called one-upmanship. In sentence 16 the speaker is asserting that one of the moods of the Congress is a mood that is unruly and vindictive, whereas in sentence 17 no such assertion is made. The assertion in 17 is much like the assertion in example 18. In both cases, the speaker claims that the set of moods or marbles contains only one member with such and such a description. Given this fact, identification by set operation is a trivial matter. Of course, if the listener does not know this fact, it does not really matter; the very act of uttering the sentence assures that he knows it now.

The assumptions underlying the computation of givenness by set operation can vary from language to language. For example, in Haitian Creole (Jiirgen Meisel, personal communication), the list of participants for a conference is only definite once the conference has begun. Before that time, one cannot really refer to "the participants."

Genericalness The definite article can also be used as a marker of genericalness. When we say "The butterfly is graceful," we maybe using the definite article generically. In such cases, the referent of the noun is the whole class. It is clear that we are not referring to the individual members of the class, because we can say "The silkworm butterfly lays its eggs in the mulberry tree" or "Silkworm butterflies lay their eggs in the mulberry tree," but not "The silkworm butterfly lays their eggs in the mulberry tree." Thus, reference must be to the class and not to the individuals of the class. Uniqueness of reference is guaranteed, because there is only one class that can be the referent.

Indefinite Article

The initial introduction of an item in discourse is accomplished through the use of an indefinite pronoun or an indefinite article with a noun. The actual shape of this introduction determines the way in which the speaker may make future references to that item.

Shatz (1983) revealed one child's difficulties in learning to use the indefinite article to provide initial descriptions of referents.

A five-year-old wrote a story beginning, "One morning the little old woman . . ." Her brother, aged 7, criticized her as follows:

Bro: You should have said "a little old woman."

Sis: Why? What's wrong with "the?"

Bro: You don't know who the woman is yet. You have to use "a" when you don't know her.

However, a little learning is a dangerous thing. Bro overapplied the "first mention takes the indefinite" rule to produce the following error, which Sis, a year older and wiser by this time, gleefully corrected. Bro: Where's a woffel? (Woffel was a nickname for the family dog.) Sis: "A" woffel? "The" woffel. There's only one woffel in the whole

world. Of course, even this final correction of Bro's error was an error in itself.

The basic use of the indefinite article *a/an* is to introduce a single nonunique referent. Because it introduces a singular referent, the indefinite article can only be used with countable nouns. The noun that follows the article is used to identify the class of which the referent is a member.

The indefinite article has two alternative readings, which have often been characterized as "referential" and "nonreferential." However, in order to avoid talking about such improbable things as the "referential referent" or the "nonreferential referent" of a noun, the terms "instantiated" instead of "referential" and "parameterized" (Webber, 1981) instead of "nonreferential" are used here.

Instantiated The most common use of the indefinite article is to refer to some real member of a group. Thus, in the sentence "I saw a pig" reference is being made to some real pig. Because the indefinite article and its noun refer to a single real-life instance of a pig, this is called the "instantiated" use of the indefinite article. *Parameterized* The indefinite article may also be used to refer to all the individual members of a class, as in "A businessman has to have a briefcase." The parameterized reading of "businessman" produces an interpretation of the sentence that says, in effect, that "whatever businessman you choose, he has to have a briefcase." In this reading, the indefinite article uses the following noun to set clear parameters on the shape of the possible referents without actually limiting reference to a single item. These readings of the article can be distinguished in pairs such as sentences 19 and 20:

19. Betty wants to marry a cowboy, but he is too old.
20. Betty wants to marry a cowboy, but she hasn't met one yet.

For both the instantiated and the parameterized uses of the indefinite article, the attached noun must refer to some item. In the instantiated use, the noun refers to a real-world referent. In the parameterized use, the noun "refers" not to a real-world referent, but to an item in the lexicon that sets parameters on the class of real-world referents. Alternatively, one can think of the parameterized use as referring to a whole class in terms of an enumeration of each of its individual members. For example, in the sentence, "Every man who owns a donkey beats it," the initial description (Webber, 1981) of "donkey" is parameterized. As a result, it is possible to treat the singular initial description as referentially plural, as in "Every man who owns a donkey beats it, but the donkeys are planning to get back at them."

This contrast between instantiated and parameterized initial descriptions is not unique to the indefinite article. It extends to the indefinite use of the demonstrative article *this*. As Prince (1981) noted, the demonstrative article can be used indefinitely in sentences such as "There was this hippie, you see." In such cases, the article refers to a particular instance (in the sense of sentence 19), but does so indefinitely. As is shown in the next section, the instantiated/parameterized contrast also extends to pronoun interpretation. Furthermore, Akmajian (1979, pp. 162-174) showed how this distinction has important consequences for the use of clefts and relative clauses in English.

In order to process sentences containing anaphorically definite articles or pronouns, the listener must be able to locate items either as parameters or as instances in his working memory. Thus, when processing either an indefinite article or an indefinite pronoun, the listener has to decide whether to set up a new referential instance in working memory or to simply activate a lexical item without making it refer to a real entity.

Pronominalization

Like articles, pronouns may be definite or indefinite. Definite pronouns include *he, she, it, they, that, this, these, his, hers,* and *theirs.* Indefinites include *some, one, another, somebody's, any,* and *a few.* An indefinite pronoun like *one* usually refers not to an instance, but to a class. Consider these sentences:

21. Jane likes a turtle, and Paula likes one too.

22. Jane wants a turtle, and Paula wants one too.

23. Bill likes his beer cold and Jim likes it warm.

24. Bill kicked his Bronco, and Jim kicked it too.

In sentence 21 the initial description of "a turtle" could be either parameterized or instantiated, but the pronoun "one" must be understood as parameterized. Consequently, the listener has to match "one" to the lexical category "turtle"; but once this is done, there is no need to identify a particular pragmatic referent. In sentence 22 the initial description of "a turtle" is not parameterized, but the word "one" still refers to the class. Thus, locating a pragmatic referent is again unnecessary. On the other hand, with singular definite pronouns such as "it" in sentence 23, both a lexical referent and a pragmatic instance must be identified. After matching "it" to the parameter "beer," the listener must still decide on an instantiated pragmatic referent. Reasoning that each man is probably drinking his own beer, listeners would choose "Jim's beer" as the referent of "it." In sentence 24, the lexical referent of "it" is "Bill's Bronco"; in this case, the pragmatic referent is identical to the lexical referent.

Regardless of whether or not a pronoun can be instantiated, the listener always has to match it to the correct lexical item. Two steps are involved in this matching process. First, the listener has to determine the semantic features associated with the pronoun. For example, *he* is (+ animate), (+ third person), (+ singular), and (+ nominative); whereas *ours* is *(*+ animate), (+ first person), (+ plural), and (+ possessive). The pronoun *that,* on the other hand, is simply (+ singular). All uses of these pronouns must maintain these "core features." However, to unambiguously match a pronoun to a referent, the listener must also decide which of the following polysemes best characterizes the speaker's meaning.

Exophora The deictic pronouns *this* and *that* have particularly strong exophoric readings. For example, a sign may say "This is Cody Springs," and point directly at the town. However, *this* and *that* are not the only pronouns that can be used exophorically. The personal pronouns *we, you, he, she, it,* and *they* also can receive exophoric readings. For instance, someone may comment to another listener on a poor joke made by the previous speaker by saying "He is silly, isn't he?"

Anaphora As in the case of the definite article, another way in which pronouns may be identified is anaphorically. In the case of anaphoric identification, the pronoun is bound to the last-mentioned noun that has the semantic features corresponding to the pronoun. Fortunately, the very last noun that was mentioned often has the required features and usually is the most likely referent for the pronoun (Charniak, 1973; Sanford and Garrod, 1979; Springston, 1977). Consider the following sequence:

Tom was holding a red ball and a blue ball. He threw Hank the red ball. Hank was holding a green ball. He threw it to Bill.

In the last sentence of this sequence, the most likely referent for "he" is "Hank," because Hank is the most recently mentioned noun that also has the required features for animacy and masculinity. The relationship between a pronoun and the last-mentioned noun is particularly strong for reflexive pronouns such as *himself, itself,* and *herself.* Whereas reflexive pronouns demand that the coreferent noun be in the same clause as the pronoun, object pronouns such as *him, her,* and *//* do not have

polysemes permitting coreferents within the same clause. As a result, Springston (1977) found that subjects were quick to comprehend sentences like 25, but slow at comprehending sentences like 26.

25. Bill made John shoot himself.

26. Bill made John shoot him.

In sentence 25, the candidacy of "John" as the referent of "himself is strongly supported by the proximity of the object pronoun. In sentence 26, the candidacy of "John" as the referent of "him" is inhibited by the proximity of the object pronoun. Eventually, the less recent alternative "Bill" wins out. Ambiguity between anaphoric and exo-phoric uses of demonstrative pronouns can often lead to misunderstandings. For example, suppose there is a tea party and Speaker A is discussing the quality of different types of teas. The last tea he mentions is Jasmine. Speaker B then continues with "This is not really my favorite tea." At that point it may be unclear whether Speaker B intends to refer to the exophoric cup of Assam tea he is drinking or to the anaphoric Jasmine tea mentioned by Speaker A.

Cataphora Although cataphoric readings of pronouns are less common than anaphoric readings, they are governed by similar principles. It is important to realize that cataphora can serve a real communicative function in sentences like "Well, I haven't seen him yet, but John is back." The phrase "I haven't seen him yet" is taken to be background material in which knowledge of the referent for "him" is presupposed. It is in cases such as these, where background material logically precedes foregrounded material, that cataphora is most likely to occur (Mittwoch, 1979). Bickerton (1975) has suggested that a speaker may pronominalize any noun phrase as long as its referent (cataphoric or anaphoric) is not a part of the "focus," i.e., the main assertion of the sentence. To see how this principle works, consider sentences 27 to 30:

27. It was my *punching* him that annoyed Bill.

28. It was my *punching* Bill that annoyed him.

29. It was my punching *Bill* that annoyed him.

30. It was my punching *him* that annoyed Bill.

In sentences 27 and 28, the pronoun "him" can be interpreted as Co-referential with "Bill." In these two sentences, the focus is on "punching," which is the main assertion of the sentence; "him" and "Bill" are parts of the presupposed background. In sentence 29, "Bill" is the focus and thus cannot be coreferential with "him." In 30, on the other hand, "him" can be coreferential with "Bill" because "Bill" is not the focus. In each of these four sentences, the flow of pronominali-zation is correctly predicted by Bickerton's analysis.

Metaphora The fourth way of establishing the referent of a definite pronoun is through metaphora. In cases of what we shall call metaphora (referring beyond), the speaker establishes reference to the entire discourse frame or to large pieces of that frame. In many cases, the reference is to the speech-act frame within which the point sharing is embedded or to other completed speech acts. Gensler (1976) cited the following sentence types as cases of metaphoric reference to the discourse frame:

31. If this be treason, make the most of it.

32. How do you like that?

33. OK, where should we go with this? (In response to a suggestion at an administrative meeting.)

34. It fits. And I ought to have figured it out myself.The thing here would be to think of it as a network—you set it up once and then just point to it.

The uses of *this, that* and it in these sentences all refer metaphorically to the speech act itself. Related, but more complex, reference to speech act frames occurs with phrases such as "speaking of

(Schegloff and Sacks, 1973), frankly speaking," or "let'sjust say" (Cogen and Herrmann, 1976). Here, the referents are often chunks of speech in short-term memory.

Perspective The perspective is identified in English with the grammatical subject of the sentence. It is usually an animate noun and serves as the point of view from which the speaker constructs the utterance and from which the listener can best comprehend the utterance. Because utterances are often constructed of multiple clauses, there are often multiple perspectives in a sentence. However, the subject of the main clause is usually the main perspective. Pronouns may be interpreted by identification with the main perspective of the previous utterance. This interpretation process is easiest when the previous sentence contains only one animate element and consequently only one probable perspective. This is illustrated in the following sentences from Sanford and Garrod (1979):

35. The engineer repaired the television set. It had been out of order for two weeks. It was only a few months old. It was the last model. He took only five minutes to repair it.

36. The mother picked up the baby. She had been ironing all afternoon.

37. She would not be finished for some time. She was very tired.

Sanford and Garrod found that subjects spent significantly more time reading the last sentence in 37 than the last sentence in 36. Note that in 36 there is only one probable perspective, whereas in 37 there are two.

Parallel Function A pronoun in a coordinate clause can also be identified by relating it to a word that serves a "parallel function" (Akmajian, 1979; Maratsos, 1974b; Sheldon, 1974; Springston, 1977) in the earlier clause. For example, in "Paula knows why Mary came, but Bill doesn't know why she did," the pronoun "she" has a syntactic function parallel to that of "Mary" in the first clause. When the sentence has unmarked intonation, "she" refers to "Mary" rather than to "Paula." However, in "Paula knows why Mary came, but Bill doesn't know *why* she did" (stress on "why"), "she" is best identified with "Paula." This is to say that, within sentences, the parallel function poly seme is stronger than the perspective poly seme, but only if stress underlines the parallelism of the clauses. In any case, the parallel function poly seme only operates within sentences.

Role Frame of an Interaction Verb Verbs like *blame, tell, ask, command, want, offer,* or *criticize* describe scenes in which a speaker interacts communicatively or socially with a listener. The message being communicated is typically placed into either a subordinate clause as in sentence 38 or a complement clause as in sentence 41:

38. Bill criticized Paul because he talks too much.

39. Bill apologized to Paul because he talks too much.

40. Paul was criticized by Bill because he talks too much.

41. Bill told Paul that he would help him.

42. Bill told Paul that he should help him.

43. Bill may scold Paul because he disobeys orders.

44. Bill must scold Paul because he disobeys orders.

45. John telephoned Bill because he wanted some information.

46. John telephoned Bill because he withheld some information.

Caramazza et al. (1977), Caramazza and Gupta (1979), Garvey, Car-amazza, and Yates (1975), Grober, Beardsley, and Caramazza (1978), and Springston (1977) have found that the interpretation of the pronouns in these sentences depends in part on the "implicit causality" of the verbs. Thus, a causally reversed verb like "criticize" implicitly attributes more causality to the semantic patient of the main clause (as in sentences 38 and 40) than does a verb like "apologize," which attributes more causality to the semantic agent (as in sentence 39). Moreover, "strong" modals like "must" and

"should" suggest a larger causal role for the object than weak modals like "may" and "would." Because of this, "Bill" is the preferred referent of "he" in sentences 39 and 41, whereas "Paul" is the preferred referent in sentences 38, 40, and 42.

In some cases, various forces compete with each other for the selection of a referent. When such competition occurs, the preferred referent will be the noun receiving the most support. For example, in sentence 43 the verb "scold" encourages selection of "Paul" as the referent. However, parallel function and the weak modal encourage the selection of "Bill" as the referent. Conversely, in sentence 44 "scold" and the strong modal converge to support the candidacy of "Paul" as the referent of "he," while parallel function encourages the selection of "Bill" as the referent. Similarly, in sentences 45 and 46 parallel function encourages the selection of "John" as the referent of "he." In 45 this reading is supported by the verb "want," but in 46 the strong causality of "withheld" forces a reinterpretation in which "Bill" becomes coreferential with "he." Caramazza et al. (1977) have shown that subjects take longer to find the referent of "he" in sentence 46 than in sentence 45. These results are consistent with the claim that competition among polysemes leads to longer response latencies.

Topicality In a recent study of pronominalization in Chinese, Li and Thompson (1979, p. 328) found that subjects used pronominalization to mark the reinstatement of an ongoing topic. Thus, in a series of seven or eight sentences with the same topic, subjects tended to accept the deletion of a repeated topic after the first mention. However, after about four or five sentences with deleted topics, subjects felt a need to reinstate the topic with a pronoun. In this way, speakers seem to use pronouns to bind discourse together. Pronouns can function in a similar way for the listener, allowing him to link together a series of events in memory (Lesgold, 1972).

In many cases the identification of a pronoun with the topic is the same as the identification of the pronoun with a previous perspective or the last (anaphoric) mention of the lexical item. In a few cases, however, these polysemes are not identical. Charniak (1973) presents an example in which topicality contradicts anaphora:

> Today was Jack's birthday. Penny and Janet went to the store. They were going to get presents. Janet decided to get a top. "Don't do that," said Penny. "Jack has a top. He will make you take it back." (p. 312)

Of course, it is not Jack's old top that Janet will have to return. Rather it is the new one that she wants to buy for him. Here the last-mentioned (anaphoric) top already belongs to Jack, whereas the more topical top is the one Janet wants to buy. Normally, anaphoric reference would win out over topicality, but in this case there is also something illogical about Jack asking Janet to take his old top back to the store. Sensing this, the listener reverts to identifying the pronoun *it* with the more topical "top."

Ellipsis

Material that might normally be included in a sentence but that, for some reason, is omitted is said to be ellipsed. In general, material can be ellipsed when: 1) its identity is so clear that it can be taken for granted; and 2) its identity is instantiated, not just parameterized. Consider this sequence:

> *Speaker A:* Where did you put the can-opener? *Speaker B:* On the refrigerator.

If Speaker B were to respond nonelliptically, he would say "I put the can-opener on the refrigerator." However, the first part of his reply is so obvious that it can be safely omitted.

Looking at descriptions of pictures in three different languages, MacWhinney and Bates (1978) observed a decline in the ellipsis of given material with age. This developmental pattern is consistent with the findings of de Laguna (1963), Greenfield and Zukow (1978), Keenan (1974), Miller (1978), Rodgon (1976), Sechehaye (1926), Sinclair (1975), Vygotsky (1962), and Weisenburger (1976).

If it is true that very young children give a low priority to the lexicalization of given material, then it follows that their sentences should begin with new information. In fact, observational studies by Bates (1976), Fava and Tirondola (1977), Leonard and Schwartz (1977), Lindner (1898), Meggyes (1971), O'Shea(1907), Park (1974), and Viktor (1917) reported just this. In particular, Leonard and Schwartz, Lindner, and O'Shea argued that it is attentional salience that governs the order of words in early sentences. Note that, if this is true, the words that follow the first word must be viewed as afterthoughts, i.e., material that could have been omitted but that was just important enough to be lexicalized as an addendum to the main message.

When processing a sentence characterized by ellipsis, the listener must fill in the missing material with given material. However, as in the case of the definite article and the pronouns, there are several ways in which the missing material may be computed. In other words, there are several polysemes for ellipsis.

Exophora. A speaker may look at a picture and say "Beautiful." In so doing, a great deal of information that is given in the situation is ellipsed. It is up to the listener to decide how much of that information is needed to fill in the ellipsis. However, at a minimum, the utterance must mean "This thing is beautiful."

Anaphora. Ellipses may also be filled by anaphoric reference. In their study of sentence production in three languages, MacWhinney and Bates (1978) found that, across languages, ellipsis did in fact tend to increase with increased anaphoric givenness and to decrease with decreased anaphoric givenness. Dent and Greenfield (1980) and Snyder (1976) obtained similar results in experiments with English-speaking children. These data are in accord with Delis and Slater's (1977) findings that adult English speakers use more ellipsis when their listeners are familiar with the subject matter than when they are not.

Anaphoric reference for ellipsis may be computed in several ways, These techniques include parallel function, perspective maintenance, and the use of the role frame of a verb describing an interaction. Because each of these ways are fundamentally different, each is best understood as an alternative poly seme.

Parallel Function In many cases, ellipses may be interpreted by reliance on a parallel function reading. Consider these examples from Akmajian (1979):

47. *Bill* knows why he is sick, but *Sam* doesn't.

48. *Bill* knows why *he* is sick, but *Sam* doesn't.

In order to interpret sentences like 47 and 48, the listener must figure out how to "fill in the blanks." Akmajian (1979) suggested a general principle that seems to work quite well. The idea is that all information in a previous clause can carry over to the parallel position in the next clause unless it is specifically marked as contrastive. Thus, in sentence 45 everything carries over to the ellipsis except for the contrasted term "Bill." In sentence 48, however, one additional piece of information in the first clause is excluded from the second clause because of the stress on "he." Similarly in tag-questions such as sentence 49, the auxiliary in the tag must be selected to match the auxiliary of the main clause:

49. He did go to the store, didn't he?

In sentences like 47 to 49 there is really only one plausible way to "fill in the blank." In other words, only the parallel function polyseme is relevant in these sentences. Because of the obvious nature of this type of processing, there have been few attempts to investigate the comprehension of these types of ellipsis.

Perspective. Another way of identifying an ellipsed noun is by relating it to the perspective. When sentences are studied in isolation, the perspective is usually equivalent to the "subject." However, this relationship is probabilistic because the category "subject" is defined syntactically

as the noun phrase to the left of the verb phrase (Chomsky, 1965), whereas the category of "perspective" can be given a functional definition (MacWhinney, 1977): the perspective is the point of view from which the speaker constructs the sentence and from which the listener interprets the sentence.

Perspective seems to be particularly important in ellipses arising from sentential conjunction. The comprehension of ellipsis in sentential conjunction has been examined by de Villiers, Tager-Flusberg, and Hakuta (1977), Hakuta (1979), Lust (1977), Lust and Mervis (1980), Solan (1979), and Tavakolian (1977, 1978). These studies have examined the ways children fill in the "gaps" in sentences like 50 to 54. In these sentences the symbol 0 indicates an ellipsed element:

50. Kittens hop and 0 run.

51. The kittens 0 and the dogs hide.

52. Mary cooked the meal and 0 ate the bread.

53. John baked 0 and Mary ate the bread.

54. John ate the bread and 0 0 the sausage.

Note that the gaps in sentences 50, 52, and 54 are filled in by looking backward (i.e., anaphorically), whereas the gaps in sentences 51 and 53 are filled in by looking forward, (i.e., cataphorically). Of particular interest here is the fact that children find sentences like 50, 52, and 54 easier to enact and imitate than sentences like 51 and 53 (Lust, 1977). Sentences like 50, 52, and 54 involve forward gapping, but they also allow the listener to use a single perspective for interpreting the sentence. The functionalist explanation for this phenomenon points to the difficulty children have in maintaining a dual perspective in movement and placement tasks (Huttenlocher, Eisenberg, and Strauss, 1968; Huttenlocher and Presson, 1973; MacWhinney, 1977).

Role Frame of Interactional Verbs. Finally, as in the case of pro-nominalization, the computation of an anaphoric referent for an ellipsed item may depend on the role frame of the main verb, particularly if that verb describes a social interaction. To illustrate this type of computation, the use of ellipsis in infinitival complement clauses is examined. The filling of gaps in infinitival complement clauses has been examined in a series of studies (Chomsky, 1969, 1972; Goldman, 1976; Goodluck and Roeper, 1978; Gowie and Powers, 1979; Kessel, 1970; Kramer, Koff, and Luria, 1972; Maratsos, 1974b). Gaps of this type occur in sentences like 55 to 66 in which there is one noun in the main clause that is coreferential with the deleted subject of the complement clause:

55. John wants to leave.

56. John asks to leave.

57. John promises to leave.

58. "John tells to leave.

59. John wants Bill to leave.

60. John asks Bill to leave.

61. John promises Bill to leave.

62. John tells Bill to leave.

63. Bill is wanted by John to leave.

64. Bill is asked by John to leave.

65. Bill is promised by John to leave.

66. Bill is told by John to leave.

In each of these sentences, the listener has to figure out which noun in the main clause is the subject of the infinitive "to leave." There seem to be three ways for the listener to make this decision. First, Maratsos (1974b) showed how preschoolers place heavy emphasis on the fact that, if there is only one noun, it must be the missing subject of the infinitive. This solution simply carries the perspective of the main clause into the complement clause. This method works for sentences like 55, 56, and 57; however, Tavakolian (1978) has shown that, around age 3, children use perspective maintenance even for sentences like 59 where the perspective of the main clause is not the perspective of the complement.

Somewhat older children take the opposite tack and identify all gaps in complements with the patient of the main clause. This second way of computing complement ellipsis works in sentences 59, 60, 62, 63, 64, and 66. In sentences 59, 60, and 62, the ellipsed element could be interpreted by choosing the NP "closest" to the infinitive. However, Maratsos has shown that the child's interpretation is based more on semantic roles than "distance" in either deep or surface structure.

Finally, children learn to fill in the gap by relying on the specific role frames of the various main verbs. For example, for the verb "promise" (sentences 61 and 65), the child simply learns that the subject of the complement verb is the subject of the main clause. For the verb "asked," the child learns that the subject of the complement verb is the object of the main verb. In other words, when given a complement clause with an ellipsed element or a pronoun, the child has to look up the main verb in his lexicon and use its role frame to determine the correct anaphoric referent for the ellipsed element or pronoun. These specific role frames are acquired as co-occurrence patterns bound to specific lexical items. Research has shown that these co-occurrence patterns are learned very slowly with acquisition continuing until the mid-school years. For more detail on the course of these developments and for a fuller characterization of the notions of co-occurrence patterns and lexically bound patterns, see MacWhinney (1982).

Cataphora. We have already noted that in sentences such as 51 and 53 gaps must be filled in cataphorically. Because cataphoric identification goes against perspective maintenance and because it places greater demands on memory (Wanner and Maratsos, 1978), it seems to be more difficult for both children and adults.

Metaphora. Speakers may also use ellipsis to delete material that can be identified by reference to the whole speech scene. For example, when we say "Too bad!" we may be intending: "It is too bad that you had to go all the way downtown just to find the store closed." Note that, if we had said "That's too bad," then the pronoun *that* still would have had a metaphoric referent.

Relativization

Brown (1958) noted that the general rule governing item specification is to "be only as specific as necessary." If you can get by with ellipsis, do so. If a pronoun will suffice, use a pronoun. If not, use a definite article with a noun. Krauss and Weinheimer (1964, 1967), Olson (1970), and Osgood (1971) presented experiments demonstrating a general relation between all of the preceding devices and the need for item specification.

There are, however, some situations where pronouns and definite articles do not provide adequate specification. In such cases, speakers sometimes use adjectives and phrases as qualifiers. Thus, the item "the dog" may be further identified as "the black dog" or "the dog on the right." Karmiloff-Smith (1979, p. 78) has shown that, between the ages of 3 and 11, children make progressively more accurate use of adjectives for item specification.

A more elaborate type of specification involves the use of relative clauses. However, these clauses are used only when the preceding simpler devices are inadequate. A second qualification is that not all relative clauses can be used for item specification. There are two types of relative clauses: restrictive and nonrestrictive. Restrictive clauses are used to specify the exact

identity of a referent. At the same time, they convey presupposed information. Nonrestrictive relative clauses have a quite different use; they convey material that is not presupposed but that is backgrounded in terms of the main story line.

Relatives Used for Item Specification. Limber (1976) observed that relative clauses are used far more frequently with objects (i.e., comments) than with subjects (i.e., themes). Both Limber (1976) and Zubin (1979) attributed this asymmetry to the fact that subjects are most likely to be given and need no further identification, whereas comments are full of new information requiring further identification. Because comments are usually inanimate, their specification often results in the use of relative clauses with inanimate head nouns.

Although restrictive relative clauses are commonly used to specify information in the main clause that is either new or confusable, they themselves contain information that is presupposed to be true. While serving the function of item specification, they also serve the function of conveying a speaker's presuppositions. The fact that restrictive relative clauses convey presupposed information is most evident in pseudo-cleft sentences such as "The one who ate the apple was John." In this case, it is presupposed that someone ate the apple. At the same time, it is asserted that the one who ate the apple was *John.* Adjectives also can be used to convey presupposed material (Schachter, 1973). Thus, the phrase "a red fish" presupposes that there is at least one fish that is red. Similarly, "the girl that Hank dated" presupposes that Hank dated someone.

Relatives Used for Backgrounding In contrast to the preceding restrictive clauses, nonrestrictive relative clauses in sentences such as "Bill, who is a friend of Harry's, was the first to arrive" do not convey presuppositions, nor do they serve to identify or specify items. Instead, such clauses are used to convey background assertions or asides. They tell us about information that is secondary to the main plot or story line. For further discussion of the role of backgrounded information in a story line, see Hopper (1979).

Stress

The English language possesses a rich array of intonational patterns for marking emotional and informational contrasts. Of these, primary stress is the one that has the most applications to point sharing. Stress can be interpreted through a variety of polysemes. These different po-lysemes appear in denials, responses, questions, reversals, and clefts. *Stress in Denials* The second sentence in sequence 67 illustrates how assertions can be focused in denials.

67. a. Bill seems to have taken the wrench, b. No, it was *Hank* who took the wrench.
     Presupposed: someone had taken the wrench. Asserted: the one who did so was Hank.

Following Chomsky (1971) we can analyze sentence 67b into *a focus* (the asserted element *Hank)* and a *presupposition* (the rest of the sentence). It also appears that, for sentences of this type to occur, two conversational conditions must be met:

> 1. The presupposition must be clear to all parties. (This is most likely to occur when the presupposition is actually stated in a preceding
> statement or question.)
> 2. The focus must be, at least implicitly, a denial of the assertion made
> in the previous utterance.

These conditions can be fulfilled by two types of very simple sequences—contrast and questioning. Sequence 67 illustrates how an item can be put into focus by contrastive denial. In 67a, the speaker asserts that "Bill seems to have taken the wrench." In 67b, the second speaker accepts all but one element in that previous sentence. In this sense, almost all of 67a is taken as the background for 67b. The only part that is not accepted is the part that is specifically denied. This kind of denial results in a particularly strong level of contrast or emphasis (Boadi, 1974; Bolinger, 1961).

Textual analyses by Berman and Szamosi (1972), Bolinger (1961), Gunter (1966), and Schmerling (1974) have indicated that the use of emphatic stress is closely tied to the need for marking contrastivity or focus. Experimental studies with children by Cruttenden (1974), Hornby (1971), Hornby and Hass (1970), and MacWhinney and Bates (1978) support these linguistic analyses quite clearly. However, stress is not the only device used to mark focus; word order also can be used for this purpose. Although young children initially determine the speaker's focus by relying almost exclusively on his use of stress, between the ages of 5 and 10 they shift from a reliance on stress to a reliance on word order (Hornby, 1973; MacWhinney and Price, 1980).

Stress in Questions Focusing in questions works in a way that is quite parallel to focusing in denials. Both statement-denial pairs and question-answer pairs can be best understood as simple cases of what Schenkein (1978) called "set-ups." In such sequences the structure of the first speaker's assertions and presuppositions loosely determines or "sets up" the structure of the next speaker's contribution (Hatcher, 1956; Most and Saltz, 1979). In a tWi-question, the focus is usually the w/j-word. Thus, in sentence 68a, the focus is on *who*.

68. a.   Who chased the cat?

    b.   The *dog* chased the cat.

    Presupposed: someone chased the cat. Asserted: the one who did so was the dog.

It is also possible to have a question in which primary stress is placed on an asserted element. Thus, if I walk into a living room and find the walls covered with tastefully executed landscapes and portraits, I might well ask, "Who's the *artist!*" with stress on *artist*. In that case, I am asserting that there is an artist and I am asking who that artist might be.

Stress in Identification Reversal A fourth possible reading of con-trastive stress is one that relates primarily to pronouns. Here contras-tive stress is used explicitly to state that the normal interpretations of the pronouns must be reworked. Consider examples 69 to 72:

69. Tim hit Peter and then he hit Bill.

70. Tim hit Peter and then *he* hit Bill.

71. Tim saw Peter and then *he* saw *him*.

72. Tim saw Peter and then he saw *him*.

In sentence 70 stress tells us that it is Peter rather than Tim who hit Bill. In sentence 71 the stress tells to reverse the roles of Tim and Peter. In sentence 72 the stress tells us to look outside of the sentence to find the referent of the pronoun "him." The kind of operation required by this referent reversal is particularly difficult for young children (Maratsos, 1973; Solan, 1979). One explanation for this difficulty might be that young children have problems in applying operations (i.e., transformations) to complete surface forms.

Stress in Clefts English tends to place the greatest stress on the last content word in the sentence. In order to place a contrastive element into this salient position, English speakers may use a variety of cleft and pseudocleft structures. These and other structures were included in a study by Hornby (1974). In that study, Hornby found that identification of the focus is cued by at least four factors that summate algebraically: 1) stress, 2) sentence final placement, 3) postcopular placement, and 4) placement following the agential "by" marker. Thus, the most clearly marked focus is the stressed agent in a passive pseudo-cleft like "The one whom the apple was eaten by was the *cook*," in which all four cues converge on the final noun. Consistent with this position, both Hornby (1974) and Carpenter and Just (1977) found that the pseudocleft structure yielded the strongest effects of focusing. In both studies, it was found that, the more clearly a sentence marks focus, the more quickly subjects can verify that sentence.

Two of the studies of cleft sentences reported by Carpenter and Just are particularly interesting because they show how focus operateswithin a discourse context. In one study, Carpenter and Just asked subjects to read sequences like 73 and 74:

73. Where is John? The one who is leading Jim is John.

74. Where is Jim? The one who is leading Jim is John.

They found that subjects were quicker to answer 73b than 74b. Sentence 73a serves to "set up" the focus as "John" and 73b follows along with that set-up, placing "John" in a stressed position and "Jim" in a presupposed relative clause. In sentence 74b, on the other hand, the focus is placed inappropriately in the presupposed relative clause.

Carpenter and Just detected even stronger effects of a discourse "set-up" in a second experiment with sequences like 75 and 76:

75. The ballerina captivated a musician in the orchestra during her. The one whom the ballerina captivated was the trombonist.

76. The ballerina captivated a musician in the orchestra during her performance,. The one who captivated the trombonist was the ballerina.

Sentences like 76 took 1.444 seconds longer to comprehend than sentences like 75. In 75a and 76a "the ballerina" is given and cannot serve as the focus for the cleft. However, "musician" is new indefinite information in need of further identification. In sentence 75b the new information is identified by the focus of the pseudocleft. In sentence 76b, however, the presupposed information is identified. This is a mistake, because the material that needs to be identified is the new information, not the given information.

Initialization

In English, the beginning of the sentence is a position of particular importance. The positioning of an item at the beginning of the sentence can be used to encode a variety of grammatical functions. These include interactional indicators, vocatives, imperatives, question markers, conditions, and topics.

Interactional Regulation When words like *alright, well,* and *now* are used to express interactional sequencing, they must occur at the beginning of the utterance.

Vocatives When the speaker is calling the addressee by name, the summons may appear at the beginning of the sentence. This occurs most frequently with warnings, commands, questions, and other emotional communications.

Imperatives Imperative verbs must also be initialized. However, they may follow vocatives and interactional markers as in "John, now come here."

Questions Like imperative verbs, w/i-words, and the auxiliaries in yes/no questions must be initialized.

Conditions Initialization may also be used to convey the fact that something is a condition on the applicability of the following sentence. Often the speaker wishes to describe the settings or conditions under which an event transpires. Consider the sentence "Late at night on Tuesday in Chicago in the park by the Lakeshore, one of the gorillas named Irving was seen signing to a chimp." Here there is a string of six temporal and spatial conditions. These conditions set the stage for the interpretation of the main predication. Note that this sentence is not "about" Chicago or Tuesday or the Lakeshore. Rather it is "about" a gorilla named Irving. Thus, Irving is the perspective of the predication and the various initial phrases are used to set the conditions for that predication (Dik, 1978, pp. 140-141).

State-setting conditions play a particularly important role in languages like Chinese, where they often resemble themes. Consider these sentences from Barry (1975):

77. eijyan shi-   wo dzwo jfl.
    That   matter I   act as boss.
    "I am in charge of that matter."

78. shu   (dangjung), jeige   dzwei hau
    book(s) among   this one most good
    "Among books, this one is the best."

79. neiban   sywesheng, ta dzwei tsungming
    that class students   in   he most   smart

"In that class of students, he is the brightest."

In both English and Chinese, preposed phrases can be used to set the stage for the main point. However, in Chinese, as in Ameslan (Grosjean and Lane, 1976) and Hungarian (Dezso", 1972), this can be done with much greater flexibility than in English because the grammar makes fewer requirements regarding prepositions, possessive markers, and participials. Nonetheless, the basic motive of conditionalization seems to be the same across these languages.

Most of the preceding examples involved preposed prepositional phrases. However, it is even more common in English to set conditions with adverbial phrases. Consider the sentence "If you mow his lawn, then Steve will pay you four dollars." Here the asserted event is that Steve will pay the listener four dollars. However, this event is guaranteed to occur only within the context of a certain frame that is understood to stay in effect for the duration of the insert (Clark and Clark, 1977). The frame is the situation in which the listener mows Steve'slawn. Thus, as Haiman (1978) argued, conditional clauses set the scene for the main predication. Other clause types that can be used as condition setters include absolutes (Berent, 1975), temporals, and parentheticals. Although all of these clause types are typically initialized, they also may occur in other positions. For example, many of them may be placed in sentence-final position as afterthoughts.

Introduction of a New Topic.   Initialization may also be used to introduce a new topic. When this occurs, the topicalized noun phrase usually doubles as the perspective and appears before the verb. Karmiloff-Smith (1976) has presented some clear examples of how this occurs in the context of a story description. In her study, children described a short sequence of pictures involving a child and a balloon vendor. At the beginning of the story, the children used left-dislocations such as "the boy, he . . ." Later in the story, when attention shifted from the little boy to the balloon vendor, children again used left dislocations such as "the vendor, he. . ." These results show that such structures are used not only to introduce the first actor at the beginning of the story, but also to change to a new principal actor. Karmiloff-Smith's studies were conducted in French where left-dislocations are, if anything, more common than in English. However, she also reported frequent use of right-dislocations at the same points in the story where left-dislocations are used. For example, one child said, "Then all of a sudden he lets go of it and it goes off far away, the balloon." In this case the right-dislocation was necessary to disambiguate the two uses of // in the French sentence "Puis tout d'un coup il le lache et puis il part tres loin, le ballon."

All of the preceding dislocations involve topicalized noun phrases that double as perspectives. However, there are many instances in which speakers use left-dislocations when their topics cannot double as perspectives. For example, consider the left-dislocation in sentence 80:

80. The refrigerator, we're going to have to clean it up before Carole comes.

81. The refrigerator is going to have to be cleaned up by us before Carole comes.

82. We're going to have to clean up the refrigerator before Carole comes.

Having taken "the refrigerator" as a starting point, it is very difficult to finish out the sentence without a left-dislocation. Sentence 81 avoids the left-dislocation, but at the cost of some extremely clumsy wording. Sentence 82 is clearly the best alternative. However, if a speaker has for some reason already committed himself to "the refrigerator" as a starting point, then sentence 80 would be the most likely form of expression. Facts such as these have led Allerton (1978), Chafe (1976), Duranti and Ochs (1979), Karmiloff-Smith (1979), and MacWhinney (1975) to consider instances of left-dislocation in which the initial noun is not the subject of the verb as cases of "premature topics." These topics are premature in the sense that they fail to merge the role of the topic with that of the perspective.

Such premature topics seem to be particularly common in Italian (Duranti and Ochs, 1979), where they are used in competitive attempts to get the floor. Languages like Italian, German, and Hungarian allow more left-dislocation than English. This may be attributed to the fact that the former languages have fewer ways of shifting perspective within the verb (Kirkwood, 1978). In terms of our present analysis, left-dislocations are topics that the speaker has introduced before he has completely decided on the verb he plans to use in the comment (Lindsley, 1976). For the listener this type of left-dislocation can be decoded in terms of an instruction to set up a topic that is separate from the perspective.

An example of both a left-dislocation and a way to forewarn the listener of the need to set up a topic was given by Keenan and Schief-felin (1976, p. 240). In this example, the speaker uses an initialized topic-introducing phrase to forewarn the listener of an upcoming change in topics, and then a left-dislocation to identify what the new topic will be. The example involves two girls discussing the reading required for their courses. One says, "Oh 1 g'ta tell ya one course, the modern art, the twentieth century art, there's about eight books." Here the nominal phrases "one course, the modern art, the twentieth century art" reinstate a topic from previous discourse. This particular reinstatement utilizes the topic-introducing phrase / gotta tell ya. Other topic-introducing phrases used like this include you know that, remember the, there wax a, and this. These topic-introducing phrases with left-dislocations alert and then instruct the listener to shift attention to a new topic. This new topic may be familiar to the listener, but it cannot be the current topic of the discourse.

Preverbal Positioning

Perhaps no other device has received more attention from psycholinguists than preverbal positioning. According to the Prague School of Functional Linguistics, elements that are given and topical are usually placed before the verb. In many sentences, the preverbal noun is also the first content word in the sentence. Mathesius (1939) held that this initial element is the item "which is known or at least obvious in a given situation and from which the speaker proceeds." TravniCek (1962) went somewhat further and suggested that the initial element of a sentence is "the sentence element which links up directly with the object of thought, proceeds from it, and opens the sentence thereby." These descriptions underscore the importance of givenness in determining the selection of a starting point.

Unfortunately, the writers of the Prague School often failed to distinguish between initialization and preverbal positioning. In many cases the first noun is also the preverbal noun, the topic, and the perspective of the sentence. However, left-dislocations make it clear that, even in English, this "coalition" (Bates and MacWhinney, 1982a) can break down. In left-dislocations, the dislocated item is the initial element and the topic, but it is not always the perspective. The preverbal element, on the other hand, is the perspective and the subject of the verb. In Czech, a language that figures prominently in many of the Prague School analyses, the dissociation is clearer, because initialization codes topicality whereas preverbal positioning codes perspective. Because left-

dislocations are fairly rare in English, preverbal positioning is generally used to express not only agency, focus, and perspective (MacWhinney, 1977), but also givenness and topicality. In order to clarify the ways in which preverbal positioning serves each of these functions in English, the research on givenness, topicality, focus, and agency is reviewed here. Perspective is covered later in this chapter.

Givenness Studies of actual language samples do in fact show that preverbal nouns are fairly likely to be given. For example, Limber (1976) compared preverbal and post verbal pronouns, i.e., nominal phrases that require given referents. In seven different samples of actual adult and child dialogues, Limber found that preverbal nominal phrases are pronominal 87% of the time, whereas postverbal noun phrases are pronominal 35% of the time. Similarly, definite articles are more likely to precede preverbal nouns than postverbal nouns. Finally, studies of adult acceptability judgments (Bock, 1977; Bock and Irwin, 1980; Grieve and Wales, 1973; Hupet and LeBouedec, 1975; Klenbort and Anisfeld, 1974; Wright and Glucksberg, 1976) have shown that listeners prefer sentences in which the given is placed before the new. For example, Hupet and LeBouedec (1975) found that adult subjects preferred sentence 83 to sentence 84, and 85 to 86:

83. I thought that the gangster had injured a policeman.

84. I thought that a policeman had been injured by the gangster.

85. 1 thought that the policeman had been injured by a gangster.

86. I thought that a gangster had injured the policeman.

Here the subjects preferred sentences in which the preverbal noun (after "I thought that") was preceded by a definite article, even if the sentence was in the passive. Thus, one possible "use" of the passive (Anisfeld and Klenbort, 1973) might be to place given material into a preverbal position, as in sentence 85.

One problem with the studies discussed in this section is that none of them have attempted to distinguish between givenness and topicality as determinants of preverbal positioning. Using frequency counts from language samples, there is no easy way to draw this distinction. Moreover, in studies of acceptability judgments, it is hard to know exactly how subjects use meaning to determine acceptability. It is not entirely clear whether, in actual sentence production, preverbal positioning has any strong relation to givenness. In fact, MacWhinney and Bates (1978) found that, as the anaphoric givenness of an element increased in their picture description task, its preverbal positioning actually decreased. However, to a certain degree, this decrease resulted from an increased ellipsis of given material.

Current Topicality The possible importance of the current discourse topic in determining preverbal positioning is illustrated in Good-enough-Trepagnier and Smith (1978). These authors have shown that subjects prefer sentences in which the preverbal element is also the discourse topic.

Data from several studies of elicited production provide general support for a hypothesized relation between topicality and preverbal positioning. Carroll (1958), Osgood (1971), Tannenbaum and Williams (1968), and Turner and Rommetveit (1967) have shown that subjects use passives to position semantic patients preverbally when presented with a discourse context in which the patient is an anaphorically given topic and the agent is new. The simplest case of this manipulation is the question test utilized by Hatcher (1956) and Most and Saltz (1979). This test is based upon the fact that items that are presupposed and topical in the question are also presupposed and topical in the answer. For example, the question "Who threw the ball?" is likely to evoke the answer "The pitcher threw the ball." However, it could also evoke the answer "The ball was thrown by the pitcher." In this second sequence, the fact that the patient (i.e., "the ball") is also an anaphorically given topic encourages use of the passive with preverbal positioning of the topical element. All of these studies have shown that passives cannot be evoked simply by making the patient exophorically given in

some visual context and the agent exophorically new. Rather, it is necessary to make the patient topical.

Note that the studies reviewed in this section point to a relation between the current topic of discourse and preverbal positioning. Initialization in a left-dislocation, on the other hand, introduces a new topic of discourse.

Focus. Preverbal positioning may also be used to mark newness or focus. Focusing is a process that directs the listener's attention to some item because of its surprise value or inherent interest. It is largely an attention-getting process that is independent of both the discourse topic and the perspective. In many cases, the focus is an adverbial rather than a nominal and cannot serve as the perspective from which the sentence is interpreted. For example, in generating sentences like "Never in my life have I seen such a crowd" or "Up the street trotted the dog," structure-altering "root" transformations (Hooper and Thompson, 1973) mark a focused element by positioning it before the tense-bearing verb. Moreover, in generating questions such as "Who did John see?" the w/i-question transformation serves a similar function. In all these cases, we may say that preverbal positioning marks focus or newness. Hooper and Thompson (1973) showed that such reorderings can occur only within asserted clauses. Thus, there seems to be a close association between focusing, assertion, and preverbal positioning.

Perspective. The preverbal noun usually codes the perspective. Evidence supporting this claim is examined in the section on subject-verb agreement below.

Agency. In most transitive sentences in English, the agent is the NP that immediately precedes the verb. Of course, in the passive, the preverbal NP is the perspective but not the agent. In a series of studies (Beilin, 1975; Bever, 1970; Braine and Wells, 1978; Chapman and Kohn, 1978; Chapman and Miller, 1975; de Villiers and de Villiers, 1973; Dewart, 1972, 1976; Huttenlocher et al., 1968; Maratsos, 1974a; Sinclair and Bronckart, 1972) it has been shown that, in English, young children tend to assume that the noun phrase (NP) before the verb is the agent even when the sentence contains syntactic cues to the contrary. Similar results have been obtained when comprehension is evaluated from: 1) the behavioral responses of young children (de Villiers and de Villiers, 1972; Shipley, Smith, and Gleitman, 1969; Wetstone and Friedlander, 1973); and 2) sentence verification tasks with somewhat older children (Beilin, 1975; Gaer, 1969; Slobin, 1966; Suci and Hamacher, 1972; Turner and Rommetveit, 1967). Furthermore, the superiority of actives (with a preverbal agent) to passives (with a non-preverbal agent) in adult comprehension has been demonstrated by Clifton, Kurcz, and Jenkins (1965), Clifton and Odom (1966), Gough (1965), Miller (1964), Slobin (1966, 1968), and many others.

Some authors have thought of the preverbal-NP-as-agent strategy as a first-NP-as-agent strategy. In other words, they have claimed that it is initialization rather than preverbal positioning that codes agency. In some cases, it is claimed that this use of initialization is a linguistic universal. Studies of Japanese and Tagalog (Hakuta, 1979; Segalowitz and Galang, 1976) would seem to support the relation between initialization and agency. However, the Japanese and Tagalog systems are complex and the developmental results are not fully interpretable. In other languages, such as Hungarian and Turkish, the situation is more straightforward, with one case suffix uniformly signaling who did what to whom. Under such circumstances, evidence for a universal assignment of agency to the first NP is not obtained (Aksu and Slobin, in press; MacWhinney, 1976). Furthermore, Bates et al. (1982) found no evidence for a first-NP-as-agent strategy in the enactment of VNN and NNV sentences by Italian adults. In English, there was even a tendency for adults to choose the second noun as the agent in VNN and NNV sentences.

Word Order and Lexical Availability. So far, the analysis of the point-making system has focused on the ways in which devices are used to express meanings. However, it is important to remember that a speaker is constrained not only by the nature of the meanings he wishes to express, but also by the availability of information in real time. In particular, initialization or preverbal

positioning might be particularly facilitated when the exact lexical item (not just a paraphrase) is already available. Testing for this possibility, Bock and Irwin (1980) found that both givenness and lexical availability make independent contributions toward encouraging the initialization of an item. In general, it seems that initialization in English operates most smoothly when a noun that is available, animate, and topical can also serve as the focus, the agent, and the perspective. In such cases, the initial item is also the preverbal item.

Subject-Verb Agreement

In English, the element that precedes the verb is also the element that governs the number of the verb. This element appears in the nominative case and is often the first element in the sentence. Thus, in English, the devices of preverbal positioning, verbal governance, nominative case marking, and initialization are all highly correlated. However, sentences like "Never have I ever seen a ruder pest" show that, even when it does not occur preverbally, the subject of the verb still codes the perspective. To see what this means, consider some examples:

87. The monkey is on the limb.
88. The limb is under the monkey.
89. Our son talks like our chimp.
90. Our chimp talks like our son.

In sentence 87 the perspective seems fairly normal, whereas in sentence 88 things seem to be topsy-turvy. Why should we talk about where the "limb" is located? It seems to make more sense to locate the monkey. In the case of sentences 89 and 90, neither sentence seems unnatural. However, the two sentences imply markedly different things and these differences are largely a function of differences in perspective.

MacWhinney (1977) argued that: 1) the subject (i.e., the NP governing the person and number of the verb) is always the perspective; and 2) speakers tend to choose as subjects those elements whose stance or perspective most closely matches their own. Of course, speakers always see themselves as highly human, highly animate, and highly active. They also tend to see themselves as conversational participants and as the instigators or causers of actions and events (DeLancey, 1981). Thus, when speakers have to select a subject and a perspective for the verb, they tend to select the element that is maximally human and animate (Jarvella and Sinnott, 1972; Turner and Rommetveit, 1967) as long as that element can also be perceived as the instigator of the action.

In order to maintain the disambiguating function of role assignment, it is crucial that the agent always be the instigator of the action and that its role be marked in some way by morphology or word order. Thus, in "Meg gave Alan the watch," Meg is the agent and the instigator of the action. If we were to abandon the rules of English word order and say "The watch gave Alan Meg," we would have no idea of who was the agent and the instigator of the action. However, languages do provide alternative ways of viewing the instigation of an action (Kirkwood, 1978). Instead of the first sentence, one can say "Alan got the watch from Meg" with "Meg" as the instigator.

Perspective also governs role assignment in comparatives. Here it is possible to distinguish two cases: the case of the figure and the case of the ground. The figure serves as the perspective or subject. For example, in a sentence like "John is bigger than Bill," "John" is the figure and "Bill" is the ground. Here, a figure is selected so that the relational predicate (i.e., big) is maximally compatible with the perspective that speakers like to assume in their interactions with the world. As Boucher and Osgood (1969), Clark (1973), Cooper and Ross (1975), Ertel (1977), MacWhinney (1977), and Osgood and Bock (1977) have argued, this perspective is usually one that can be characterized as big, strong, good, kind, clean, and so forth. Thus, speakers tend to prefer a

sentence like "John is bigger than Bill," in which the figure is big, to a sentence like "Bill is smaller than John," in which the figure is small.

A similar situation arises in locative clauses where the object being located is the figure and the location is the ground. For example, in the sentence "The star is above the line," the figure is "the star" and the ground is "the line." Clark (1974) has reviewed a large body of research (including Clark and Chase, 1973, 1974; Huttenlocher and Higgins, 1971; Huttenlocher et al., 1968; Smith and McMahon, 1970) indicating that speakers and listeners prefer figures that are above, in front of, ahead of, first, to, and into over figures that take a perspective that is below, in back of, after, behind, last, from, and out of. The naturalness of the perspective of unmarked words like above and first is demonstrated in lower latencies for answering questions, following instructions, and verifying sentences. This tendency is, again, a reflection of the "preferred stance" that MacWhinney (1977) called perspective.

Verb Selection

In English, the most frequently used verbs are those that place the most active, figural, or human element in preverbal position. However, many verbs have "inverse" forms that can be used to express secondary perspectives. When there are two highly active human elements, the responsibility for an event is divided between them. This division of responsibility often is achieved through the use of an inverse verb that assigns subject/perspective status to the more active element. An example of such a division and the use of an inverse verb was given in the last section. The following sentences contain other examples of this division:

91. Bill gave Tom the scissors.
92. Tom was given the scissors by Bill.
93. Tom took the scissors from Bill.
94. Tom got the scissors from Bill.
95. Every Sunday follows a Saturday.
96. *A Saturday is followed by every Sunday.
97. A Saturday precedes every Sunday.
98. Every Saturday is followed by a Sunday.

Sentences like these display an interesting set of relationships between point sharing, syntactic structure, and the lexicon. These relationships have been studied by Bowerman (1982), Fillmore (1970), Kirkwood (1978), MacWhinney (1977), Sgall (1972), Talmy (1976), and others. Sentence 92 illustrates a patient in preverbal position, presumably because it is topical and perspectival. Sentence 93 achieves a similar effect while also promoting "Tom" to agent status. However, in sentence 93 this change in verbs also forces a change in our understanding of the event, with Bill becoming much more passive than he was in sentence 92. Sentence 94 has an interpretation lying somewhere between that of 93 and that of 92. Finally, sentence 96 is particularly interesting because it shows that sentence 95 cannot be directly passivized but must be inverted as in sentence 97. This may be due to a tendency to interpret an indefinite NP as "nonparameterized" before a passive verb. Because subjects of topics are "marked" for topicality (Anisfeld and Klenbort, 1973), it would be strange to have them parameterized.

By continuing to explore the ways in which verbs serve to place nouns into their preferred case roles, we may eventually be able to elucidate the details of the perspective system and the ways in which perspective interacts with verbal conflation, verbal aspect, and discourse structure.

Case Marking

Because English marks case only for pronouns, there has been little experimental investigation of perspective as a determinant of case marking. By contrast, linguists working with languages with more extensive systems of case marking have devoted a great deal of attention to this issue, particularly during the last few years. For example, Zubin (1979) argued that the German nominative expresses the item of maximum perspective, the dative the item with medium perspective, and the accusative the item with minimum perspective. The idea that different cases and types of transitivity show different degrees of perspective can also be found in Hopper and Thompson (1980).

Zubin also reported that, in relative clauses, writers tend to place the relative pronoun into the nominative case as a marker of givenness. In about 24% of the sentences he examined, the given item was also the perspective. However, in the other 76% of the data, perspective conflicted with givenness for use of the nominative case. When such competition occurred, perspective won out about 56% of the time and givenness dominated about 38% of the time. In about 6% of the conflicts, neither givenness nor perspective won. Thus, both perspective and givenness seem to be important possible readings of nominative case markings in German.

In a related vein, Garcia and Otheguy (1977) found that, in Spanish, when the subject was low in animacy (and hence low in perspective), the recipient of the action was likely to be in the dative case; but, when the subject was high in animacy, the recipient was likely to be in the accusative case. Similarly, in German, Zubin (1977) noted that verbs that impose strong physical contact on the object take the accusative, whereas ones with gentler contact take the dative. Hopper and Thompson (1980) have noted that many languages mark the direct object only when it might compete with the agent as a perspective, i.e., when it is definite, referential, animate, etc. It seems that languages often omit case markings when it is clear which element is the perspective. The decision to use or not use case markings is rule governed, however (Comrie, 1979).

Particles

One of the most extensive parts of the point-sharing system is the network of pragmatic adverbs and particles such as surely, still, even, but, moreover, well, and maybe, which convey instructions about how to process the assertions in the sentence and what presuppositions to make. Although no complete description of this system has yet been attempted, the articles collected by Weydt (1979) on German and English particles show how much important material is to be found in this particular area of the point-sharing system.

To illustrate some of the issues involved in the acquisition of particles, let us examine Stern's (1980) data on the use of the particle ebe by Swiss-German children. When used as an adjective ebe means "flat" or "even." But when used as a particle, ebe means "the following item is obviously true, as we both know." In its use as a particle, ebe roughly corresponds to exactly in the English sentence "That is exactly what I was going to say," or to just in the English sentence "I was going to say just that." In its use as a particle, ebe has two polysemes: when stressed, it refers the listener to facts in previous discourse; and when unstressed, it calls the listener's attention to presupposed facts. Stern showed that, at around the age of 6 or 7, children use ebe correctly to refer to presupposed knowledge but often make errors in their use of stressed ebe to refer to facts from the preceding discourse. This is because children can access presuppositions directly, whereas they have trouble remembering all the propositions that have been asserted in an ongoing narrative.

MAKING AND USING THE INSTRUCTIONS

In the previous sections we reviewed the various alternative readings for 12 major devices from the point-sharing system. Table 1 lists the 12 devices and their polysemes. It also provides a summary statement regarding the nature of the instructions conveyed by each poly seme. Some of the more important results deriving from the study of functional grammar are summarized in Table 1. The various linguistic and psycholinguistic investigations reviewed in this chapter provide evidence that people make continual use of constructs such as givenness, parameterization, anaphora, perspective, backgrounding, presupposition, focus, exophora, parallel function, and contrast. In fact, one might go so far as to say that these basic components of the point-sharing system constitute a set of processing routines that provide the 360 basic structure not only for the process of human communication, but also for much of thought itself. However, these routines and structures are not utilized separately from the overall system of human information processing, nor are they exempt from the limits and constraints common to all higher cognitive processes.

Device	Polysemes	Explanation
Definite Article	Core: unique identifiability	
	Exophora	In the perceptual situation
	Anaphora	In the preceding discourse
	Cataphora	In the following discourse
	Paraphrase	In a lexical paraphrase
	Partonymy	As a part of a prior referent
	Set operation	By the nature of the set
	Genericalness	By the generic type
Indefinite Article	Core: nonunique identifiability	
	Instantiated	Referent exists
	Parameterized	Noun parameterizes referent
Pronouns	Core: number, sex, person, case…	
	Exophora	In the perceptual situation
	Anaphora	In the preceding discourse
	Cataphora	In the following discourse
	Metaphora	To a speech act
	Perspective	Point of view
	Parallel function	Role structure of previous clause
	Role frame	Role frame of a verb
	Topicality	Rhetorical structure of discourse
Ellipsis	Core: givenness	
	Exophora	In the perceptual situation
	Anaphora	In the preceding discourse
	Parallel function	Role structure of previous clause
	Perspective	Point of view
	Role frame	Role frame of a verb
	Cataphora	In the following discourse
	Metaphora	To a speech act
Relative Clauses	Core: additiona of info about noun	
	Specification	To narrow class of referents
	Presupposition	To convey presupposed material
	Backgrounding	To include background material
Stress	Core: contrast	

	Denials	Rejection of a previous point
	Questions	Specification of needed info
	Answers	Response to queries
	Reversals	Reversal of normal identification
	Clefts	Marking of sentence focus
Initialization	Core: starting point	
	Interactional	Turn-taking
	Vocatives	Summons
	Imperatives	Grammaticalized
	Questions	Grammaticalized
	Conditions	Set frame for predication
	Topic introduction	Setting up a discourse topic
Preverbal positioning	Core: perspective	
	Givenness	Unique identifiability
	Topicality	Continuing a discourse topic
	Focus	Attentional salience
	Perspective	Point of view
	Agency	Actor, causor
Subject-verb agreement	Core: perspective	
Verb selection	Core: perspective flow	
Case marking	Core: perspective flow	
Particles	Core: discourse presuppositions	

Given the analysis in Table 1, one can then ask: What kind of an information-processing system does a speaker need in order to formulate these instructions, and what kind does the listener need in order to decode the instructions? First, it is clear that both the speaker and the listener must make use of a mental "dictionary" or lexicon. This lexicon provides the listener with the readings of words, and also allows the listener to find paraphrases and associates for lexical items. Paraphrase, partonymy, and identity of reference are important in the processing of definite reference. The lexicon also contains those aspects of the grammar that are bound to specific lexical items (MacWhinney, 198?); more general rules of the language are stored in the grammar.

As Clark and Marshall (1981) pointed out, a dictionary and a grammar are not enough to make a language user competent. In addition, both the speaker and the listener must possess a "diary" and an "encyclopedia." One of the many uses of the diary is to maintain, in short-term memory, notes about the current discourse. In other words, both the speaker and the listener must possess a short-term memory that stores not only the various referents (anaphoric and exophoric) but also the ways in which the predications fit together. This is to say that short-term memory involves: 1) lexical memory, 2) reference memory, and 3) discourse memory. Lexical memory is used to compute givenness in terms of the parameterized values set up by initial descriptions. Reference memory stores pointers to specific instantiated referents that have been mentioned in the discourse or are present in the real world. Discourse memory is used to compute contrast, assertion, focus, topic, metaphorical givenness, and other rhetorical operations. Initially, discourse memory organizes predications from the point of view of the perspective developed by the speaker. Eventually, the topic probably takes over the major role as the organizer of material in the diary (Reder and Anderson, 1980).

In addition to a dictionary, a grammar, and a diary, both the speaker and listener must possess a store of factual material in long-term memory. This store may be thought of as an encyclopedia. Although access to the memories in this encyclopedia is governed at least in part by the structure of the dictionary, the exact shape of the relation between the dictionary and the encyclopedia (Clark and Clark, 1977) has not yet been worked out. However, access in both systems probably involves

some form of spreading activation and intersecting searches (Anderson, 1976; Collins and Loftus, 1975). Clark and Marshall (1981) have suggested that at least one way of accessing the encyclopedia is by social group membership. Access of this type could facilitate the computation of certain types of presuppositions and definite references. The material in the encyclopedia must be accessed whenever the message encodes certain facts as presupposed for a given speaker-listener pair. The listener must check his store to see if such material is actually there. If it is not, he must decide whether or not to add it. Asserted material also must be either added to semantic memory or rejected as invalid.

Finally, the speaker and the listener must both utilize a set of rhetorical structures for controlling the addition of information to the encyclopedia. These structures filter and organize information according to its credibility, utility, and relevance. Conditions set on predications, the perspective structure of the message, the asserted-presupposed contrast, and the overall shape of the argument in terms of the sequence of rhetorical acts will all influence the listener to either accept or reject the message. The system that uses rhetorical structures to add information to either the diary or the encyclopedia can be thought of as a "rhetoricon." Thus, the five basic structures needed for the processing of points are: 1) a lexicon or dictionary, 2) a grammar, 3) an encyclopedia with long-term knowledge, 4) a diary with a referent memory and a discourse/lexical memory, and 5) a rhetoricon.

LEARNING THE SYSTEM

In order to share points effectively, the child must acquire the various point-sharing devices and their polysemes. In addition, he must construct the basic structures of a dictionary, a grammar, an encyclopedia, a diary with a lexical, referent, and discourse memory, and a rhetoricon. Because successful use of the devices of the point-sharing system relies on these five systems, the child's system may not operate on the adult level even after the devices themselves have been acquired. For example, Karmiloff-Smith (1979) and Stern (1980) have found that correct interpretation of the definite article/particle ebe may be blocked by an inadequate or inadequately constructed discourse memory.

Regarding the acquisition of the point-sharing devices themselves, one developmental hypothesis that is consistent with the data currently available is that the polysemes of the different devices emerge in the order of their "cue validity." Thus, the first devices and the first readings the child learns are those that are used most frequently and are most unambiguous in the language. This hypothesis is also the one proposed by MacWhinney (1978) for the acquisition of morphophonolgy and by MacWhinney (1982) for the acquisition of syntax and lexical semantics. Data from a recent study by Bates et al. (1982) supported this hypothesis for the comprehension of word order cues by English-speaking and Italian-speaking children.

Bates and MacWhinney (1982a) also claimed that, when a given device serves a number of common uses, its first uses appear to be based on a prototype structure (Bates et al., 1982). This structure resembles a Venn diagram in which the central element, i.e., the prototype, has the maximum number of characteristics in common with the other members of the class. For example, the prototypical pre verbal element is an agent that also serves as the perspective for the verb. Very young children comprehend preverbal nouns in terms of this prototype. Of course, simple use of the prototype will not work in the case of the passive where the perspective is not the agent. Older children will learn that a nonperspectival agent is coded with a by-clause in the passive. Over time, the child sorts out the separate functions originally merged in the prototype and learns to use additional devices for rarer constellations of meanings. This progression is analogous to the one associated with the child's acquisition of the meanings of content words (Anglin, 1977; Bowerman, 1978; Rosen, 1973; Rosch and Mervis, 1975).

Because of the difficulty researchers face in achieving experimental control over devices such as verbal conflations, particles, and participials, we know little about their use in either adults or children. As a result, current functionalist grammar (Dik, 1978) is adequate as a description of the simple sentences of a preschooler. However, the expressive capacities of the school-age child go far beyond the bounds of current theory. This means that functionalist grammar cannot yet tell teachers exactly how to improve children's command over the more expressive grammatical devices. We can identify causes of inadequate article use, pronominalization, ellipsis, and so on, but our knowledge does not extend much beyond these simple devices. Research on the school-age child's use of more elaborate devices is clearly needed. Many of the problems seen in both normal and abnormal children concern the development of ways to put together both simple and elaborate devices to form larger segments of effective and expressive discourse. To understand these developments, we would need to look more deeply into the structure of rhetorical forms and the development of written composition (Hayes and Flower, 1980). If we want to expand our understanding of the uses of human communication, the integration of functionalist grammar with rhetorical theory should be a top priority for further research.

CONCLUSIONS

The activity of sharing points is fundamental to human society, yet it is an activity that few of us have fully mastered. If we are to encourage the development of this ability, we need to understand not only the rudiments of the system, but also its more complex elaborations. This understanding will not be easy to achieve, nor will it be achieved without dispute. However, there is no reason to fear this disagreement, because, as Vygotsky (1962) reminds us, "it is not so much that collision of ideas gives birth to dispute as that disputes give rise to ideas." It is in this vein that the preceding analysis has been offered. It does not constitute a finished theory; rather, it attempts to organize our understanding of certain basic devices in human communication in a way that can give rise to new ideas.

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REFERENCES

Akmajian, A. 1979. Aspects of the Grammar of Focus in English. Garland Publishing, New York.

Aksu, A., and Slobin, D. I. In D. I. Slobin (ed.), Cross-linguistic Studies of Language Development. Lawrence Erlbaum Assocs., Inc., Hillsdale, N.J. (in press)

Allerton, D. 1978. The notion of "givenness" and its relations to presupposition and to theme. Lingua 44:133-168.

Anderson, J. R. 1976. Language, Memory, and Thought. Lawrence Erlbaum Assocs., Inc., Hillsdale, N.J.

Anglin, J. M. (ed.). 1977. Word, Object, and Conceptual Development. W. W. Norton and Company, Inc., New York.

Anisfeld, M., and Klenbort, I. 1973. On the functions of structural paraphrase: The view from the passive voice. Psychol. Bull. 79:117-126.

Barry, R. 1975. Topic in Chinese: An overlap of meaning, grammar, and discourse function. In R. Grossman, J. San, and T. Vance (eds.), Papers from the Parasession on Functionalism. Chicago Linguistic Society, Chicago.

Bates, E. 1976. Language and Context: Studies in the Acquisition of Pragmatics. Academic Press, Inc., New York.

Bates, E., McNew, S., MacWhinney, B., Devescovi, A., and Smith, S. 1982. Functional constraints on sentence processing: A cross linguistic study. Cognition 11:245-299.

Bates, E., and MacWhinney, B. 1979. A functionalist approach to the acquisition of grammar. In E. Ochs and B. Schieffelin (eds.), Developmental Pragmatics. Academic Press, Inc., New York.

Bates, E., and MacWhinney, B. 1982a. Functionalist approaches to grammar. In E. Wanner and L. Gleitman (eds.), Language Acquisition: The State of the Art. Cambridge University Press, New York.

Bates, E., and MacWhinney, B. 1982b. Second language acquisition from a functionalist perspective: Pragmatic, semantic and perceptual strategies. In H. Winitz (ed.), Annals of the New York Academy of Sciences: Conference on Native and Foreign Language Acquisition. New York Academy of Sciences, New York.

Beilin, H. 1975. Studies in the Cognitive Basis of Language Development. Academic Press, Inc., New York.

Berent, G. 1975. English absolutes in functional perspective. In R. Grossman, L. San, and T. Vance (eds.), Papers from the Parasession on Functionalism. Chicago Linguistic Society, Chicago.

Berman, A., and Sz£mosi, M. 1972. Observations on sentential stress. Language 48:304-325.

Bever, T. G., 1970. The cognitive basis for linguistic structures. In J. R. Hayes (ed.), Cognition and the Development of Language. John Wiley & Sons, Inc., New York.

Bickerton, D. 1975. Two levels of logical presupposition. In Papers from the Eleventh Regional Meeting. Chicago Linguistic Society, Chicago.

Boadi, L. 1974. Focus-marking in Akan. Linguistics 140:5-57.

Bock, H. K., and Irwin, D. E. 1980. Syntactic effects of information availability in sentence production. J. Verbal Learn. Verbal Behav. 19:467-484.

Bock, K. 1977. The effect of a pragmatic presupposition on syntactic structure in question answering. J. Verbal Learn. Verbal Behav. 16:723-734.

Bolinger, D. 1961. Contrastive accent and contrastive stress. Language 37:83-96.

Bolinger, D. 1972. That's That. Mouton, The Hague.

Boucher, J., and Osgood, C. 1969. The Pollyanna hypothesis. J. Verbal Learn. Verbal Behav. 8:1-8.

Bowerman, M. 1978. Systematizing semantic knowledge: Changes over time in the child's organization of word meaning. Child Dev. 49:977-987.

Bowerman, M. 1982. Reorganizational processes in lexical and syntactic development. In E. Wanner and L. Gleitman, (eds.), Language Acquisition: The State of the Art. Cambridge University Press, New York.

Braine, M. D. S., and Wells, R. S. 1978. Case-like categories in children: The actor and some related categories. Cognitive Psychol. 10:100-122.

Bresson, F. 1974. Remarks on genetic psycholinguistics: The acquisition of the article system in French. In Current Problems in Psycholinguistics. Editions de C.N.R.S., Paris.

Brown, P., and Levinson, S. 1978. Universals in language usage: Politeness phenomena. In E. Goody (ed.), Questions and Politeness. Cambridge University Press, Cambridge, England.

Brown, R. 1958. How shall a thing be called? Psychol. Rev. 65:14-21.

Caramazza, A., Grober, E., Garvey, C., and Yates, J. 1977. Comprehension of anaphoric pronouns. J. Verbal Learn. Verbal Behav. 16:601-609.

Caramazza, A., and Gupta, S. 1979. The roles of topicalization, parallel function and verb semantics in the interpretation of pronouns. Linguistics 17:497-518.

Carpenter, P., and Just, M. 1977. Integrative processes in comprehension. In D. Laberge and S. Samuels (eds.), Basic Processes in Reading: Perception and Comprehension. Lawrence Erlbaum Assocs., Inc., Hillsdale, N.J.

Carroll, J. 1958. Process and content in psycholinguistics. In R. Patton (ed.), Current Trends in the Description and Analysis of Behavior. University of Pittsburgh Press, Pittsburgh.

Chafe, W. 1976. Givenness, contrastiveness, definiteness, subjects, topics, and point of view. In C. Li (ed.), Subject and Topic. Academic Press, Inc., New York.

Chapman, R. S., and Kohn, L. L. 1978. Comprehension strategies in two- and three-year-olds: Animate agents or probable events? J. Speech Hear. Res. 21:746-761.

Chapman, R. S., and Miller, J. F. 1975. Word order in early two- and three-word utterances: Does production precede comprehension? J. Speech Hear. Res. 18:355-371.

Charniak, E. 1973. Context and the reference problem. In R. Rustin (ed.), Natural Language Processing. Algorithmics Press, New York.

Chomsky, C. 1969. The Acquisition of Syntax in Children from 5 to 10. MIT Press, Cambridge, MA.

Chomsky, C. 1972. Stages in language development and reading exposure. Harvard Educ. Rev. 42:1-33.

Chomsky, N. 1965. Aspects of the Theory of Syntax. MIT Press, Cambridge, MA.

Chomsky, N. 1971. Deep structure, surface structure, and semantic interpretation. In D. Steinberg and L. Jakobovits (eds.), Semantics. Cambridge University Press, Cambridge, England.

Clark, H. 1973. Space, time, semantics, and the child. In T. E. Moore (ed.), Cognitive Development and the Acquisition of Language. Academic Press, Inc., New York.

Clark, H. 1974. Semantics and comprehension. Curr. Trends Ling. 12:1291-1428.

Clark, H., and Chase, W. 1973. On the process of comparing sentences against pictures. Cognitive Psychol. 3:472-517.

Clark, H., and Chase, W. 1974. Perceptual coding strategies in the formation and verification of descriptions. Memory Cognition 2:101-111.

Clark, H., and Clark, E. 1977. Psychology and Language. Harcourt, Brace, Jovanovich, Inc., New York.

Clark, H., and Marshall, C. 1981. Definite reference and mutual knowledge. In A. Joshi, B. Webber, and I. Sag (eds.), Elements of Discourse Understanding. Cambridge University Press, Cambridge, England.

Clifton, C., Kurcz, I., and Jenkins, J. J. 1965. Grammatical relations as determinants of sentence similarity. J. Verbal Learn. Verbal Behav. 4:112-117.

Clifton, C., and Odom, P. 1966. Similarity relations among certain English sentence constructions. Psychol. Monogr. 80.

Cogen, C., and Herrmann, L. 1976. Interactions of the expression 'let's just say' with the Gricean maxims of conversation. In C. Cogen, H. Thompson, G. Thurgod, K. Whistler, and J. Wright (eds.), Proceedings of the First Annual Meeting of the Berkeley Linguistics Society. University of California Berkeley.

Collins, A., and Loftus, E. 1975. A spreading-activation theory of semantic processing. Psychol. Rev. 82:407-428.

Comrie, B. 1979. Genitive-accusatives in Slavic: The rules and their motivation. In B. Comrie (ed.), Classification of Grammatical Categories. Linguistic Research, Inc., Urbana, IL.

Cooper, W., and Ross, J. 1975. Word order. In R. Grossman, L. San, and T. Vance (eds.), Papers from the Parasession on Functionalism. Chicago Linguistic Society, Chicago.

Cruttenden, A. 1974. An experiment involving comprehension of intonation in children from 7 to 10. J. Child Lang. 1(2):221-231.

de Laguna, G. A. 1963. Speech: Its Function and Development. Indiana University Press, Bloomington. (first published in 1927)

de Villiers, J., and de Villiers, P. 1973. A cross-sectional study of the acquisition of grammatical morphemes in child speech. J. Psycholing. Res. 2:267-278.

de Villiers, J., Tager-Flusberg, H., and Hakuta, K. 1977. Deciding among theories of the development of coordination in child speech. Papers Rep. Child Lang. Dev. 13:118-125.

de Villiers, P., and de Villiers, J. 1972. Early judgments of semantic and syntactic acceptability by children. J. Psycholing. Res. 1:299-310.

DeLancey, S. 1981. An interpretation of split ergativity and other patterns. Language 57:626-657.

Delis, D., and Slater, A. S. 1977. Toward a functional theory of reduction transformations. Cognition 5:119-132.

Dent, C. H., and Greenfield, P. M. 1980. An experimental approach to the developmental study of pragmatic presupposition. In D. Ingram, F. C. C. Peng, and P. Dale (eds.), Proceedings of the First International Congress for the Study of Child Language. University Press of America, Lanham, MD.

Dewart, M. H. 1972. Social class and children's understanding of deep structure in sentences. Br. J. Educ. Psychol. 42:198-203.

Dewart, M. H. 1976. The role of animate and inanimate nouns in determining sentence voice. Child memory. Unpublished manuscript, Medical Research Council, London, England.

Dezso", L. 1972. Bevezetds a mondattani tipolbgiaba (in Hungarian). TIT kozpontja, Budapest.

Dik, T. 1978. Functional Grammar. North-Holland, New York.

Donnellan, K. 1966. Reference and definite descriptions. Philos. Rev. 75:281-304.

Duranti, A., and Ochs, E. 1979. Left-dislocation in Italian conversation. In T. Giv6n (ed.), Syntax and Semantics. Academic Press, Inc., New York.

Ertel, S. 1977. Where do the subjects of sentences come from? In S. Rosenberg (ed.), Sentence Production: Developments in Research and Theory. Lawrence Erlbaum Assocs., Inc., Hillsdale, N.J.

Fava, E., and Tirondola, G. 1977. Syntactic and pragmatic regularities in Italian child discourse: Grammatical relations and word order. Institute di Glot-tologia, Florence, Italy.

Fillmore, C. J. 1970. Subjects, speakers, and roles. Ohio State University Working Papers in Linguistics 4:31-63.

Gaer, E. 1969. Children's understanding and production of sentences. J. Verbal Learn. Verbal Behav. 3:55-59.

Garcia, E. C., and Otheguy, R. 1977. Dialect variation in leismo: A semantic approach. In R. W. Fasold and R. W. Shuy (eds.), Studies in Language Variation: Semantics, Syntax, Phonology, Pragmatics, Social Situations, Ethnographic Approaches. Georgetown University Press, Washington, D.C.

Garrod, S., and Sanford, A. 1977. Interpreting anaphoric relations: The integration of semantic information while reading. J. Verbal Learn. Verbal Behav. 16:77-90.

Garrod, S., and Sanford, A. 1978. Anaphora: A problem in text comprehension. In R. N. Campbell and P. T. Smith (eds.), Recent Advances in the Psychology of Language. Plenum Publishing Corporation, London.

Garvey, C., Caramazza, A., and Yates, J. 1975. Factors influencing assignment of pronoun antecedents. Cognition 3:227-243.

Gensler, O. 1976. Non-syntactic antecedents of frame semantics. In K. Whistler, J. Jaeger, M. Petruck, H. Thompson, and A. Woodbury (eds.), Proceedings of the Second Annual Meeting of the Berkeley Linguistics Society. University of California, Berkeley.

Goldman, S. 1976. Reading skill and the minimum distance principle: A comparison of listening and reading comprehension. J. Exp. Child Psychol. 22:123-142.

Goodenough-Trepagnier, C., and Smith, F. 1978, Thematization and intonation in the organization of sentences. Lang. Speech 21:99-107.

Goodluck, H., and Roeper, T. 1978. The acquisition of perception verb complements. In H. Goodluck and L. Solan (eds.), Papers in the Structure and Development of Child Language. University of Massachusetts, Amherst.

Cough, P. 1965. Grammatical transformations and speed of understanding. J. Verbal Learn. Verbal Behav. 4:107-111.

Gowie, C., and Powers, J. 1979. Relations among cognitive, semantic, and syntactic variables in children's comprehension of the minimum distance principle: A two-year developmental study. J. Psycholing. Res. 8:29-41.

Greenfield, P., and Zukow, P. G. 1978. Why do children say what they say when they say it?: An experimental approach to the psychogenesis of presupposition. In K. E. Nelson (ed.), Children's Language. Gardner Press, New York.

Grieve, R. 1973. Definiteness in discourse. Lang. Speech 16:365-372.

Grieve, R., and Wales, R. 1973. Passives and topicalization. Br. J. Psychol. 64:173-182.

Grober, E., Beardsley, W., and Caramazza, A. 1978. Parallel function strategy in pronoun assignment. Cognition 6:117-133.

Grosjean, F., and Lane, H. 1976. Pauses and syntax in American sign languages. Unpublished manuscript, Northeastern University, Boston.

Gunter, R. 1966. On the placement of accent in dialogue: A feature of context grammar. J. Ling. 2:159-179.

Haiman, J. 1978. Conditionals are topics. Language 54:564-589.

Hakuta, K. 1979. Comprehension and production of simple and complex sentences by Japanese children. Doctoral dissertation, Harvard University.

Hatcher, A. 1956. Syntax and the sentence. Word 12:234-250.

Haviland, S., and Clark, H. 1974. What's new? Acquiring new information as a process in comprehension. J. Verbal Learn. Verbal Behav. 13:512-521.

Hawkins, J. 1977. The pragmatics of defmiteness: Part 1. Ling. Berichte 48:1-25.

Hayes, L., and Flower, L. 1980. Identifying the organization of writing processes. In L. Gregg and E. Steinberg (eds.), Cognitive Processes in Writing. Lawrence Erlbaum Assocs., Inc., Hillsdale, N.J.

Hooper, J., and Thompson, S. 1973. On the applicability of root transformations. Ling. Inq. 4:465-497.

Hopper, P. 1979. Aspect and foregrounding in discourse. In T. Givon (ed.), Syntax and Semantics. Academic Press, Inc., New York.

Hopper, P., and Thompson, S. A. 1980. Transitivity in grammar and discourse. Language 56:251-299.

Hornby, P. 1971. Surface structure and the topic-comment distinction: A developmental study. Child Dev. 42:1975-1988.

Hornby, P. 1973. Intonation and syntactic structure in the development of presupposition. Unpublished manuscript, State University of New York, Plattsburgh.

Hornby, P. 1974. Surface structure and presupposition. J. Verbal Learn. Verbal Behav. 13:530-538.

Hornby, P., and Hass, W. 1970. Use of contrastive stress by preschool children. J. Speech Hear. Res. 13:395-399.

Hupet, M., and LeBouedec, B. 1975. Definiteness and voice in the interpretation of active and passive sentences. Q. J. Exp. Psychol. 27:323-330.

Huttenlocher, J., Eisenberg, K., and Strauss, S. 1968. Relation between perceived actor and logical subject. J. Verbal Learn. Verbal Behav. 7:527-530.

Huttenlocher, J., and Higgins, E. 1971. Adjectives, comparatives, and syllogisms. Psychol. Rev. 78:487-504.

Huttenlocher, J., and Presson, C. 1973. Mental rotation and the perspective

problem. Cognitive Psychol. 4:277-299.

Jarvella, R., and Sinnott, J. 1972. Contextual constraints on noun distribution to some English verbs by children and adults. J. Verbal Learn. Verbal Behav. 11:47-53. Karmiloff-Smith, A. 1976. More about the same: Children's understanding of

post-articles. J. Child Lang. 4:377-394. Karmiloff-Smith, A. 1979. A Functional Approach to Child Language: A Study

of Determiners and Reference. Cambridge University Press, New York. Keenan, E. O. 1974. Conversational competence in children. J. Child Lang.

1:163-183.

Keenan, E., and Schieffelin, B. 1976. Foregrounding referents: A reconsideration of left-dislocation in discourse. In H. Thompson, K. Whistler, V. Edge, J. Jaeger, R. Javkin, M. Petruck, and C. Smeall (eds.), Proceedings of the Second Annual Meeting of the Berkeley Linguistics Society. University of California, Berkeley.

Keenan, J., and Kintsch, W. 1974. The identification of explicitly and implicitly presented information. In W. Kintsch (ed.), The Representation of Meaning in Memory. Lawrence Erlbaum Assocs., Inc., Hillsdale, N.J.

Kessel, F. 1970. The role of syntax in children's comprehension from ages six to twelve. Monogr. Soc. Res. Child Dev. 35, Serial no. 139.

Kirkwood, H. 1978. Options and constraints in the surface ordering of noun phrases in English and German. J. Pragmatics 2:225-245.

Klenbort, I., and Anisfeld, M. 1974. Markedness and perspective in the interpretation of the active and passive voice. Q. J. Exp. Psychol. 26:189-195.

Kramer, P., Koff, E., and Luria, Z. 1972. The development of competence in an exceptional language structure in older children and young adults. Child Dev. 43:121-130.

Krauss, R. M., and Weinheimer, S. 1964. Changes in reference phrases as a function of frequency of usage in social interaction: A preliminary study. Psychonomic Sci. 1:113-114.

Krauss, R. M., and Weinheimer, S. 1967. Effect of referent similarity and communication mode on verbal encoding. J. Verbal Learn. Verbal Behav. 6:359-363.

Leonard, L., and Schwartz, R. 1977. Focus characteristics of single-word utterances after syntax. J. Child Lang. 5:151-158.

Lesgold, A. 1972. Pronominalization: A device for unifying sentences in memory. J. Verbal Learn. Verbal Behav. 11:316-323.

Li, C. N., and Thompson, S. A. 1979. Third-person pronouns and zero-anaphora in Chinese discourse. In T. Givdn (ed.), Syntax and Semantics. Academic Press, Inc., New York.

Limber, J. 1976. Unravelling competence, performance and pragmatics in the speech of young children. J. Child Lang. 3:309-318.

Linde, C., and Labov, W. 1975. Spatial networks as a site for the study of language and thought. Language 51:924-939.

Lindner, G. 1898. Aus dem Naturgarten der Kindersprache (in German). Grie-ben, Leipzig.

Lindsley, J. 1976. Producing simple utterances: Details of the planning process. J. Psycholing. Res. 5:331-354.

Lust, B. 1977. Conjunction reduction in child language. J. Child Lang. 4:257-288.

Lust, B., and Mervis, C. A. 1980. Development of coordination in the natural speech of young children. J. Child Lang. 7:279-304.

Lyons, J. 1975. Deixis as a source of reference. In E. Keenan (ed.), Formal Semantics of Natural Language. Cambridge University Press, Cambridge, England.

MacWhinney, B. 1975. Pragmatics patterns in child syntax. Papers Rep. Child Dev. 10:153-165.

MacWhinney, B. 1976. Hungarian research on the acquisition of morphology and syntax. J. Child Lang. 3:397-410.

MacWhinney, B., 1977. Starting points. Language 53:152-168.

MacWhinney, B. 1978. The acquisition of morphophonology. Mongr. Soc. Res. Child Dev. 43.

MacWhinney, B. 1982. Basic syntactic processes. In S. Kuczaj (ed.), Language Acquisition: Vol. 1. Syntax and Semantics. Lawrence Erlbaum Assocs., Inc., Hillsdale, N.J.

MacWhinney, B., and Bates, E. 1978. Sentential devices for conveying giv-enness and newness: A cross-cultural developmental study. J. Verbal Learn. Verbal Behav. 17:539-558.

MacWhinney, B., and Price, D. 1980. The development of the comprehension of topic-comment marking. In D. Ingram, C. C. Peng, and P. Dale (eds.), Proceedings of the First International Congress for the Study of Child Language. University Press of America, Lanham, MD.

Maratsos, M. P. 1973. The effects of stress on the understanding of pronominal co-reference in children. J. Psycholing. Res. 2:1-8.

Maratsos, M. P. 1974a. Children who get worse at understanding the passive: A replication of Bever. J. Psycholing. Res. 3:65-74.

Maratsos, M. P. 1974b. How preschool children understand missing complement subjects. Child Dev. 45:700-706.

Maratsos, M. P. 1976. The Use of Definite and Indefinite Reference in Young Children. Cambridge University Press, London.

Mathesius, V. 1939. O tak zvan^m aktualnim ilenfini vety (in Czechoslova-kian). Slovo o Slovenost 5:171-174.

Meggyes, K. 1971. Egy ke^ves gyermek nyelvi rendszere (in Hungarian). Nyelvtudomanyi Ertekez6sek 73.

Miller, G. 1964. Language and psychology. In E. H. Lennenberg (ed.), New Directions in the Study of Language. MIT Press, Cambridge, MA.

Miller, M. 1978. Pragmatic constraints on the linguistic realization of 'semantic intentions' in early child language. In N. Waterson and C. Snow (eds.), The Development of Communication. John Wiley & Sons, Inc., New York.

Mittwoch, A. 1979. Backward anaphora in utterances conjoined with "but." Paper presented at the Linguistic Society of America Winter Meeting.

Most, R., and Saltz, E. 1979. Information structure in sentences: New information. Lang. Speech 22:89-95.

Olson, D. R. 1970. Langauge and thought: Aspects of a cognitive theory of semantics. Psychol. Rev. 77:257-273.

Osgood, C. E. 1971. Where do sentences come from: In D. D. Steinberg and L. A. Jakobovits (eds.), Semantics. Cambridge University Press, Cambridge, England.

Osgood, C. E., and Bock, K. J. 1977. Salience and sentencing: Some production principles. In S. Rosenberg (ed.), Sentence Production: Developments in Research and Theory. Lawrence Erlbaum Assocs., Inc., Hillsdale, N.J.

O'Shea, M. V. 1907. Linguistic Development and Education. MacMillan, New York.

Park, Tschang-Zin. 1974. A study of German language development. Unpublished manuscript, University of Berne, Berne, Switzerland. Prince, E. 1981. On the inferencing of indefinite this NP's. In A. Joshi, B. Webber, and I. Sag (eds.), Elements of Discourse Understanding. Cambridge University Press, Cambridge, England.

Reder, L. M., and Anderson, J. R. 1980. A partial resolution of the paradox of interference: The role of integrating knowledge. Cognitive Psychol. 12:447-472.

Rodgon, M. 1976. Single Word Usage, Cognitive Development, and the Beginning of Combinatorial Speech. Cambridge University Press, Cambridge, England.

Rosch, E. H., 1973. On the internal structure of perceptual and semantic categories. In T. E. Moore (ed.), Cognitive Development and the Acquisition of Language. Academic Press, Inc., New York.

Rosch, E. H. 1977. Human categorization. In N. Warren (ed.), Studies in Cross-cultural Psychology. Academic Press, Inc., New York.

Rosch, E. H., and Mervis, C. B. 1975. Family resemblances: Studies in the internal structure of categories. Cognitive Psychol. 7:573-605.

Sanford, A., and Garrod, S. 1979. Memory and attention in text comprehension: The problem of reference. In R. S. Nickerson (ed.), Attention and Performance. Lawrence Erlbaum Assocs., Inc., Hillsdale, N.J.

Schachter, P. 1973. Focus and relativization. Language 49:19-46.

Schegloff, E. A., and Sacks, H. 1973. Opening up closings. Semiotica 8:289-327.

Schenkein, J. 1978. Studies in the Organization of Conversational Interaction. Academic Press, Inc., New York.

Schmerling, S. 1974. A re-examination of "normal stress." Language 50:66-73.

Sechehaye, M, A. 1926. Essai sur la Structure Logique de la Phrase. Champion, Paris.

Segalowitz, N., and Galang, R. 1976. Agent-patient word-order preference in the acquisition of Tagalog. J. Child Lang. 5:47-64.

Sgall, P. 1972. Fillmore's mysteries and topic vs. comment. J. Ling. 8:201-357.

Shatz, M. 1983. Communication. In J. Flavell and E. Markman (eds.), Handbook of Child Psychology, Vol. 3 (4th ed.) John Wiley & Sons, Inc., New York.

Sheldon, A. 1974. On the role of parallel function in the acquisition of relative clauses in English. J. Verbal Learn. Verbal Behav. 13:272-281.

Shipley, E., Smith, C., and Gleitman, L. 1969. A study in the acquisition of language: Free responses to commands. Language 45:322-342.

Silverstein, M. 1976. Hierarchy of features and ergativity. In R. Dixon (ed.), Grammatical Categories in Australian Languages. Australian Institute of Aboriginal Studies, Canberra.

Sinclair, H. J. 1975. The role of cognitive structures in language acquisition. In E. H. Lenneberg and E. Lenneberg (eds.), Foundations of Language Development: A Multidisciplinary Approach. Academic Press, Inc., New York.

Sinclair, H. J., and Bronckart, J. 1972. SVO-a linguistic universal?: A study in developmental psycholinguistics. J. Exp. Child Psychol. 14:329-348.

Slobin, D. I. 1966. Grammatical transformations and sentence comprehension in childhood and adulthood. J. Verbal Learn. Verbal Behav. 5:219-227.

Slobin, D. I. 1968. Recall of full and truncated passive sentences in connected discourse. J. Verbal Learn. Verbal Behav. 7:876-881.

Smith, K., and McMahon, L. 1970. Understanding order information in sentences: Some recent work at Bell Laboratories. In G. Flores d'Arcais and W. Leveit (eds.), Advances in Psycholinguistics. North-Holland, Amsterdam.

Snyder, L. 1976. The early presuppositions and performatives of normal and language disabled children. Papers Rep. Child Lang. Dev. 12:221-229.

Solan, L. 1979. Contrastive stress and children's interpretation of pronouns. Unpublished manuscript, University of Massachusetts, Amherst.

Springston, F. 1977. Some cognitive aspects of presupposed coreferential anaphora. Doctoral dissertation, Stanford University.

Stern, O. 1980. The evaluative function of the particle "ebe" in Swiss-German children's narratives. Papers Rep. Child Lang. Dev. 19:104-112.

Suci, G., and Hamacher, J. 1972. Psychological dimensions of case in sentence processing: Action role and animateness. Int. J. Psycholing. 1:34-48.

Talmy, L. 1976. Semantic causative types. Syntax Semantics 6:43-116.

Tannenbaum, P., and Williams, F. 1968. Generation of active and passive sentences as a function of subject or object focus. J. Verbal Learn. Verbal Behav. 7:246-250.

Tavakolian, S. 1977. Structural principles in the acquisition of complex sentences. Doctoral dissertation, University of Massachusetts, Amherst.

Tavakolian, S. 1978. The conjoined clause analysis of relative clause and other structures. In H. Goodluck and L. Solan (eds.), Papers in the Structure and Development of Child Language. University of Massachusetts Occasional Papers in Linguistics Psychology, University of Massachusetts, Amherst.

Travni6ek, F. 1962. O tak zvan6m aktualnim CleveSni vetnem (in Czechoslo-vakian). Slovo o Slovesnost 22:163-171.

Turner, E., and Rommetveit, R. 1967. Experimental manipulation of the production of active and passive voice in children. Lang. Speech 10:169-180.

Viktor, G. 1917. A gyermek nyelve: a gyermeknyelv irodalm£nak ismertetdse fo'ke'nt nyelv6szeti szempontb61 (in Hungarian). Nagyvarad.

Vygotsky, L. 1962. Thought and Language. MIT Press, Cambridge, MA. (first published in 1934)

Wanner, E., and Maratsos, M. 1978. An ATN approach to comprehension. In M. Halle, J. Bresnan, and G. Miller (ed.), Linguistic Theory and Psychological Reality. MIT Press, Cambridge, MA.

Warden, D. A. 1976. The influence of context on children's use of identifying expressions and references. Br. J. Psychol. 67:101-112.

Webber, B. 1981. Discourse model synthesis: Preliminaries to reference. In A. Joshi, B. Webber, and I. Sag (eds.), Elements of Discourse Understanding. Cambridge University Press, Cambridge, England.

Weisenburger, J. L. 1976. A choice of words: Two-year-old speech from a situational point of view. J. Child Lang. 3:275-281.

Wetstone, H. S., and Friedlander, B. Z. 1973. The effect of word order on young children's response to simple questions and commands. Child Dev. 44:734-740.

Weydt, H. (ed.). 1979. Die Partikelnderdeutschen Sprache. Walter deGruyter, Berlin.