Chapter 7

Informativeness, Presupposition, and Semantic Choice in Single-Word Utterances[1]

PATRICIA MARKS GREENFIELD

Our study of development within the period of single-word utterances indicates that children acquire the ability to express a variety of semantic functions during this period. They do so by combining a single word with a variety of situational elements—gesture, object, person, etc. But, given that in any particular situation the child is limited to but one verbal element, is it possible to characterize which situational element is selected for linguistic encoding? This is the problem which this paper addresses. My hypothesis is that the principle of informativeness can generally explain which element is selected. Informativeness is used in the information theory sense of uncertainty. Uncertainty exists where there are possible alternatives. But uncertainty must be defined from the child speaker's point of view. Information in this sense, then, is relative to the child. The question has been raised (by D. Crystal) as to how, in principle, for this stage of development, one can know that the intuitions of uncertainty and informativeness that one has can be ascribed to the child. Linguistics as a discipline has been accustomed to taking language as a privileged type of behavior. If we accord equal weight to behavior in other modes, the problem is no more serious at the one-word stage than at later points in the language acquisition process. In fact, we are always in the position of making inferences about mental processes from regularities in external behavior. In the case of uncertainty and informativeness, these regularities can

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be specified by sets of rules appropriate to different types of referential situation.

This distinction between "information" and "certainty" is the psychological basis for the distinction between "assertion" and "presupposition" in language. One type of presupposition is "pragmatic presupposition," the appropriate context for uttering a sentence (Keenan, 1971). Presumably, then, the "pragmatic assertion" would be the sentence itself. A pragmatic presupposition is assumed rather than stated. I want to show that this parallels the situation in single-word utterances: What, from the child's point of view, can be assumed is not stated; what cannot be assumed or taken for granted is given verbal expression by the single word. And it is the relatively certain element that is assumed, the relatively uncertain one that is stated. In this way, the cognitive distinction between certainty and uncertainty forms the psychological basis for the linguistic distinction between presupposition and assertion.

"Logical presupposition" is closely related to pragmatic presupposition, but involves a relation between sentences rather than between a sentence and its nonverbal context. One sentence presupposes another just in case the truth of the second sentence is a necessary condition for the truth or falsity of the first. The major psychological relation between the two concepts of presupposition is that a pragmatic presupposition is represented nonverbally, whereas a logical presupposition is a linguistic form. Another hypothesis of this paper is that the psychological basis for logical presupposition lies in early dialogue.

I shall illustrate these notions with one type of situation involving an inanimate object undergoing changes of state. The concept of informativeness will be used to predict when the child will encode the object verbally and when he will encode the change of state. Discourse must be drawn from a point in development where there is evidence that the child is capable of expressing both alternatives—object and state change. I shall, furthermore, analyze a discourse sample where it is known that the child has the vocabulary to encode either element because both kinds of element are in fact encoded at different times during the discourse. But which element will be expressed when? I should like to argue that there is a set of rules based on the concept of informativeness which can make such predictions; the rules are as follows:

1. When an object is not in the child's possession, it becomes more uncertain; in this case his first utterance will encode the object.
2. When the object is securely in the child's possession while it is undergoing its process or state change, the object becomes relatively certain and is not encoded first. Instead, action or state change is encoded first. (The idea of using distance from the child as a way of assessing informativeness in situations involving an object undergoing action comes from Veneziano [1973].)
3. Once the most uncertain or informative element in the situation has been encoded, be it object, or action/state, it becomes more certain and less informative. At this point, then, if the child continues to encode the situation verbally, he will now express the other aspect, heretofore unstated.

The scene presented in Table 7.1 illustrates the application of these rules; it involves the object word *car* and three action or state changes, *byebye*, *down*, and *beepbeep*. The data come from a larger longitudinal study of two children, Matthew and Nicky (Greenfield and Smith, 1976). One can look at the use of

TABLE 7.1
Object and Action or State Discourse at 18;18[a]

Preceding Context	Speaker Action		Object Action	
	M	hears	car *car*	going by outside
What's the car doing? *Where's it going?*				*byebye; byebye*
	M	pointing to whining	his car *car, car*	
You want your car?				
	M	about to push	his car	*byebye*
	M	pushing	his car	*byebye* *hmm* (car sound)
	M	patting	his car	*beepbeep*
	M	hears	car *car! car!*	going by outside
	M	hears	car *car*	going by outside
	M	looking for whining	car *car*	has fallen down
Whatcha doing?	M	throwing	his car	down *down, down*
	M	has thrown	car *car*	down
	M	hears	car *car*	going by outside
	M	looking for	his car *car*	

[a] Solid horizontal lines indicate intervening child speech. Broken horizontal lines indicate no intervening child speech, but intervening adult speech. M = Matthew. Italics indicate speech; Roman printing describes the nonverbal aspects of the referential situation. For each speech event, the child's utterance is placed under the single element in the situation that has been given verbal expression. The first column under speaker action identifies the speaker, the second, his action or state. Similarly, the first column under object action identifies the object, the second its action or staté.

these words in the ongoing situation to see whether Matthew's choice of object (*car*) rather than one of the action state words (*byebye*, *down*, *beepbeep*) reflects informational properties of the situation.

At the beginning of the scene (Table 7.1), Matthew names an absent object. Its action/state is known from the noise; uncertainty lies in the identity of the invisible object. Hence in choosing *car* rather than *byebye*, Matthew is encoding the most informative aspect of the situation. (If, in this situation, he had said *byebye* rather than *car*, his utterance would have been in violation of Rule 1, which states that the child's first utterance should encode the object if it is at a distance from the child.) Once, however, the identity of the car is established by his utterance and his mother's questions *What's the car doing?*, *Where's it going?*, action/state becomes less certain relative to object, and Matthew responds *byebye*. Here dialogue turns pragmatic presupposition into a primitive form of logical presupposition, for the questions actually represent linguistically two possible presuppositions of Matthew's assertion *byebye*: *The car is doing*, *the car is going*. Next, Matthew wants his own car, but he is at a distance from it, and so his possession is relatively uncertain. At this point he encodes the object. Next, he is pushing his car, now in his possession and its identity established by the preceding utterance. Uncertainty now shifts to its action/state, and he encodes it with *byebye*, *hmm* (if one wants to consider this imitation of a motor noise to be a word), and *beepbeep*. Next, however, he hears an invisible car pass by outside and so he goes back to *car* rather than *byebye*.

In the next scene his own car has fallen down and so he encodes the object rather than its action/state, for his own car, the object, is no longer a certainty for him. Note here that informative and "new" are not identical for Matthew. The concept that an assertion encodes "new" information whereas a presupposition contains the "old" (or "given") is the basis for some adult psycholinguistic experiments by Haviland and Clark (1974). Applying this notion to the present situation, we would be led to the prediction that Matthew would now encode the "new" change of state (*down*) rather than the "old" object (*car*). But the opposite is the case, as Table 1 shows. Although car is "old" in the scene, it is uncertain because it is out of his grasp. Thus, for nonverbal context, no simple equation of informativeness with new information is possible even though the perception of information functions as the psychological basis for the given–new contrast. Other attributes defining the child's perception of the ongoing situation must also be taken into account.

The analysis continues with the next scene. Matthew now has the car in hand and is throwing it down; object has become relatively more certain, action/state relatively less so. Mother asks *Whatcha doing?* and Matthew says *down* as we would predict. (While Matthew's utterance is preceded by a question, this particular question does not presuppose **either** the object, **or** its action/state.) Note that this scene is the only one that begins with the expression of action/state–rather than object and, correlatively, is the only one that begins with object in hand. It thus confirms the importance of physical possession as a

psychological criterion of certainty from the child's point of view. Once the car has been thrown down and its action/state expressed, object certainty decreases, and Matthew now expresses the object—*car*. In the next scene Matthew once again names an absent *car* which he hears going by outside. Finally, Matthew names the object he is searching for. Thus, Matthew's choice of object or action/state word accurately reflects the continually shifting balance between information and certainty.

Table 7.2 presents another example of this type of analysis applied to Matthew's corpus, this one involving another object and situation and occurring

TABLE 7.2
Object and Action State Discourse at 19;21[a]

Preceding Context	Speaker Action	Object Action
	M goes over to and picks up	skates *(s)ka(tes)*
	M trying to put whining, repeats	skates on *on* *(s)ka(tes)*
	M trying to put whining, repeats	skates on *on*
	M has put down trying to put whining	skates skates on *(s)ka(tes)*
They go outside.		
Do you want to put your skates on?		*yeah*
	M holding onto skates whining	*on, on*
a skate?	M whining	*on* *yeah*
		Mother putting on skates *ashoe*
	M whining	*on*
	M whining	*ashoe, ashoe*
	M tugging	skates off *on*

[a] Solid horizontal lines indicate intervening child speech; broken horizontal lines indicate no intervening child speech, but intervening adult speech. M = Matthew. Italics indicate speech; Roman printing describes the nonverbal aspects of the referential situation. For each speech event, the child's utterance is placed under the single element in the situation that has been given verbal expression. The first column under speaker action identifies the speaker, the second, his action or state. Similarly, the first column under object action identifies the object, the second its action or state (except, where there is a second agent, agent is placed first, object last). Parentheses in the child's utterance indicate omitted phonemes.

about a month later. In these scenes, Matthew is having difficulty getting his skates on and off. Therefore, trying to look at the situation from Matthew's point of view, we conclude that action/state is more in question, is less taken for granted, under present circumstances, than is the object. Hence, we would expect more frequent expression of action/state than object, which is exactly what we find. In fact, action/state is expressed six times, object only three. Let us compare these scenes with those presented in Table 7.1. In the latter, the object was often out of hand, and, correlatively, was expressed relatively more often than in the former.

In the first scene presented in Table 7.2, object is expressed when it is not yet in Matthew's possession, hence, relatively uncertain from his point of view. Next time the object—*(s)ka(tes)*—is uttered, it is after *on*; in other words, action/state has become a known because of Matthew's previous utterance. In the second scene, *skates* occurs at the one point that the skates are not in Matthew's hands. Here, the object has become relatively less certain, and this uncertainty is resolved with *skates*. In the final scene, skates are all too much connected with Matthew, and he restricts himself to encoding action/state, again in accord with the prediction from an informational analysis.

Comparing sequences of single-word utterances to two-word utterances proper, one sees that the former clearly lack the fixed word order of English syntax. A sequence is defined as a succession of single-word utterances encoding different aspects of a **single** referential situation. For instance, at the top of Table 7.2, "Matthew goes over to and picks up his skates" is considered one referential event, "Matthew trying to put skates on," a second one. A single sequence cannot span the two events. In the examples, for instance, object sometimes preceded action/state, as in *car. byebye* (Table 7.1), while the reverse order also occurred as in *on. skates* (Table 7.2). This analysis of scenes involving the encoding of objects and their actions or states indicates that variable word order in sequences of single-word utterances reflects the shifting pattern of uncertainty in the ongoing event, as seen from the child's point of view. If so, then the addition of English syntax with the onset of two-word utterances means that the child has learned that a fixed word-order rule must override the informational structure of the situation as a determinant of word order. The child temporarily loses the ability to use word order to signal the difference between relatively certain and uncertain aspects of the situation. This ability does not return until years later when the child learns how to use certain surface structure syntactic devices involving variable word order in order to signal the topic–comment distinction, for example (Hornby, 1971).

An important point is the continuity between psycholinguistic functioning in infancy and adulthood. This is demonstrated by telegraphic ellipsis in adult speech, for it requires nonverbal context in order to be comprehended (Holzman, 1971). Holzman presents an example in which one person says to another, *pretty dress*. Its comprehension depends on following the speaker's gaze to someone wearing a dress. The perception of someone wearing a particular dress is pragmatically presupposed by the assertion *pretty dress*.

In adult speech, as in child speech, there is also continuity between the role of verbal context and nonverbal situational structure. Consider the following example from Holzman's article (1971, p. 89).

Question:	Answer:
When are you going?	*Tonight*

Clearly the single-word utterance is perfectly natural in adult conversation. The response presupposes the proposition *You are going* contained in the question; this functions as "old" information. Only the "new" information is expressed in the answer.

Adult–child dialogue at the stage of single-word utterances involves exactly the same process as that described for the adult–adult example just given. Compare this example from Nicky, the other child in the study, spoken at 18;4.

Question:	Answer:
What do you want?	*Showel* (shovel)

Again, the answer supplies all the information the questioner was seeking (new information) and no more. What is presupposed from the question—*You* (the child) *want something*—is not expressed in the answer. Hence, single-word answers to questions follow the same principle as spontaneous single-word utterances: Express the single most informative element; and this principle operates for both children and adults in dialogue. Thus, when the child's utterance is produced in relation to verbal context, the certain element is the "old" information, "given" in the preceding utterance. The uncertain element expressed verbally by the child is thus always "new" information, as defined by Haviland and Clark (1974) after Chafe (1970). The situation for dialogue thus contrasts with single-word utterances produced in relation to purely nonverbal context: The informative element is always "new" information. The perceptual or cognitive distinction between information and certainty on the nonverbal plane is, through further development, thus transformed into the beginnings of the given–new distinction on the verbal plane.

I have developed other rules which make similar predictions about semantic choice in other types of situation. For instance, in the case of scenes involving an agent and his or her action, the child generally takes the agent for granted and encodes the action. Agent uncertainty seems to arise for the child in particular kinds of situation: (*a*) in the case of absent agents, as when the child names a person whom he can hear making noise in another room; (*b*) when there is conflict over agency, a question in the child's mind as to who should perform some action; and (*c*) when the child desires a change of agent. In these cases the child will encode agent rather than action or state. An example of the first sort occurs at 13;3, when Matthew says *daddy* upon hearing

his father, not yet visible, come in the outside door and start up the steps to his apartment. An example of the second sort is documented in the film *Early Words* (Greenfield, May, and Bruner, 1972) at 22 months of age. Matthew says *self*, trying to discourage his mother from buttering his bread for him so that he could carry out the action himself. An example of the third sort occurs at 19;4. Matthew has been trying unsuccessfully to cut his meat with a knife, when he hands the knife, an instrument, to his mother, saying *mommy*. Here the agent case is again used to signal a desired **change** of actor. Another example illustrates the same point, but both alternative agents are verbalized. At 20;10 Matthew's sister Lauren says *Let me do it*; Matthew answers *mommy*, explicitly replacing the agent of the verbal context, *me*, with *mommy*. This is also an example of paradigmatic substitution: That is, *mommy* can fill the same semantic/grammatical spot as *me* in the sentence *Let me do it*. The reply *mommy* presupposes *someone will do it*. This proposition is also presupposed by the original utterance *Let me do it*; it is thus "old" information. Once again, the child's answer expresses only "new" information.

The principal difference between the young child at the single-word stage and the adult is that the adult is capable of adding words when the information cannot be transmitted by nonverbal context, whereas the child is not. Despite this difference, ellipsis—incomplete sentences formed by adults—shows that basically the same process of information analysis described for earliest child language operates in adult speech. Because children generally talk about the here and now, a common process of information analysis means that an adult will often analyze a given referential situation in the same way as the child. This commonality does not in any way imply that the child speaker is aware of the listener's perspective, of what might be "old" or "new" information for the listener. The power of a process of information extraction common to child and adult is that it can make verbal communication between child and adult possible long before the child has developed any such awareness of the listener's point of view. A cognitive process common to mature speakers and language learners thus enables the still egocentric child to communicate from an impressively early point in the language learning process.