

Can information theory explain early word choice*

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(Received 14 February 1979)

ABSTRACT

One problem of interest in child language study has been specifying what features of the speech situation determine what children will say. Several cognitively based approaches to child language development have proposed principles of 'informativeness' to explain the child's choice of word(s). These principles predict that the child will choose the 'most informative' element of a situation and encode it in speech. Detailed inspection of this view reveals that the notion of 'informativeness' is not rigorously defined as in information theory, and would require the development of formal semantic and pragmatic information theories. Simpler accounts of available data do not require the notion of 'information'.

INTRODUCTION

One of the first applications of behaviourism to complex human behaviour was in the domain of language (Skinner 1957), with the explicit aim of enabling predictions of future speech events on the basis of current environmental conditions and known previous events. This enterprise has resurfaced, with little notice, in the modern garb of cognitively based approaches to child language development which putatively apply information theory to child speech. Theorists such as Bates (1976), but particularly Greenfield and colleagues (Greenfield 1978, Greenfield & Smith 1976, Greenfield & Zukow 1978) have proposed specific principles as explaining the child's choice of words in the single-word utterance period. The child is said to choose the 'most informative' element of a situation and encode it in speech. An analysis of this position reveals that the notion of 'informativeness' could not be derived from information theory (as the authors suggest) and as used is inapplicable to either spontaneous or experimentally elicited child speech. This failure is critical because these accounts of single word use and child cognition depend on this theoretical conception.

[*] This research was supported by Grant No. 15125 awarded by the National Institute of Mental Health. I would like to thank John Dore, Patricia Greenfield, and George Miller for comments on earlier versions of this paper, one of which was presented at the Biennial Meeting of the Society for Research in Child Development, San Francisco, California, 15-18 March, 1979. Address for correspondence: Department of Experimental Psychology, The Rockefeller University, 1230 York Avenue, New York, New York, 10021, U.S.A.

THE PROBLEM

A major problem of interest in child language recently has been determining what factors of a situation in which a child utters words determine what will be talked about:

How does a child know what NOT to say? Are his first uses of language capricious, or does he know from the beginning what needs to be said and what can be assumed? (Bates 1976: 96)

Given that a situational structure always involves a relation between a child speaker and a minimum of one other component, how can we characterize which element is selected for verbal encoding? (Greenfield & Smith 1976: 184)

After a survey of children's utterances, primarily from the single-word utterance period, it is concluded that:

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. (Greenfield 1978: 444)

The posing of the general problem and the proposed solution set the stage for an exposition of the information-theoretic approach, the data intended to support it, and the status of the notion of 'information' itself.

KEY CONCEPTS

The manner of exposition of information theory in these approaches to child language proceeds from the two key concepts of INFORMATION and UNCERTAINTY. On Greenfield's account, information is defined 'in the information-theory sense of uncertainty. Uncertainty exists where there are possible alternatives' (Greenfield & Smith 1976: 184). The relatively uncertain element in a situation is the element which is the relatively most informative.

As in the interpretation of the meaning of early words, where rich interpretation runs the risk of capturing the adult's intuitions rather than the child's intentions (Howe 1976), obvious problems abound in defining 'informativeness' from an adult perspective. Greenfield (1978) notes this problem, but claims that on her account, uncertainty and information are defined from the child-speaker's point of view, and not from the adult listener's. But in a key passage, we find that the child's point of view is established only by fiat:

Information in this sense, then, is relative to the child. An adult present in a given situation may, however, be able to understand the child because the child usually is referring to that situation, and the adult can see which alternatives are important for the child. (Greenfield & Smith 1976: 184)

In their later work (Greenfield & Zukow 1978), such adult views are tested as

HYPOTHESES of the child's point of view (Greenfield, personal communication). The adultomorphic construal of 'informative' is also symptomatic of deeper problems, as we shall see, with the use of the notion of 'information' itself.

HOW THE INFORMATION-THEORY APPROACH HANDLES CHILD SPEECH

Greenfield and colleagues (Greenfield 1978, Greenfield & Smith 1976, Greenfield & Zukow 1978) have elaborated a set of rules, based on the concept of informativeness, which are used to predict which element in a given situation a child will encode in speech. These rules are presented most explicitly in Greenfield & Zukow (1978), and the following exposition is derived from this account unless otherwise indicated.

Considered at a general level, the information-theoretic approach to word use is intended 'to demonstrate that there are regular relations between the structure of nonverbal events and the process of semantic choice at the linguistic level and that these regularities can best be explained in terms of the principle of informativeness, even at the one-word stage' (1978: 301). The hypothesis is made specific by a set of predictive rules, confined to 'events consisting of some entity undergoing a change produced by an agent', where 'event' is defined as 'what is occurring'. In principle, the approach is supposed to extend beyond such situations to language behaviour in general (Greenfield 1978, Greenfield & Dent, in press). The predictive rules are as follows:

Transitive Events

- (1) When an agent is making an object undergo a change of state at a distance from the speaker, perception of that event is likely to involve a shift of focus to the object in question. The identity of the object is uncertain. Hence, the object becomes a topic that is not taken for granted and will, therefore, be expressed.
- (2) When an object is in the speaker's possession or is being acted upon by the speaker, it is generally taken for granted through its connection with the self. Its identity is not in question, and it will, therefore, go unexpressed. When the object is being acted on, uncertainty will inhere in the change of state, which will be expressed.
- (3) If an object belonging to another person is given or is in the process of being given to the child/speaker, the object is taken for granted and the possessor is expressed verbally.
- (4) When the child is showing an object to another person, there is no change of state to express (Rule 2), and so the object is named.

Intransitive Events

- (5) When another animate being is acting, the speaker's attention is likely already

to be focused on the actor, who, therefore, represents a constant in the situation. The actor as topic goes unexpressed, and the action, representing a change in the situation, receives verbal expression.

(6) When the speaker is acting, the self as agent is taken for granted, and the action receives verbal expression. Another way of looking at the situation is to say that the agent is a constant while the action represents a change in the situation.

All Events

(7) If the most uncertain and informative element within a single referential event is unsuccessfully expressed, it remains uncertain and informative. Therefore, if the child continues to encode the situation verbally, he will persist in encoding that element until successful or the situation changes.

(8) If the referential event is immediately repeated, there is no change in the relative certainty and informativeness of the different elements. Therefore, if the child continues to encode the situation verbally, he will express the same element again.

(9) Once the most uncertain or informative element in a single referential event involving two elements has been given verbal expression, 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.

Subsequent Events in an Event Sequence

(10) If, in a sequence of events, the action (including locative action) remains constant while the object varies, the object will be given verbal expression.

(11) If, in a sequence of events, the object remains constant while the action varies, the action will be given verbal expression.

(12) If, in a sequence of events, the object remains constant while the location changes, the location will be given verbal expression.

(13) If, in a sequence of events, the possessor remains constant while the object varies, the object will be given verbal expression.

(14) If, in a sequence of events, the object remains constant and the possessor varies, the possessor will be given verbal expression. (In the rare case where two rules could apply to the same situation, Rules 10 through 14 override all others.) (Greenfield & Zukow 1978: 302-3)

A subset of these rules (Greenfield 1978, Greenfield & Smith 1976: 188 ff.) was originally formulated to predict children's uses of words in discourse settings occurring in a large corpus of longitudinal data. Since these data were selectively chosen from the larger corpus, both Greenfield and Bates (1976) recognized that clearcut demonstrations of the role of informativeness in the

child's choice of what to talk about would require experimental manipulations of situations:

An ideal test of this hypothesis would be a situation in which the child is applying the action to a number of different objects – eating a cookie, then a piece of cheese, then a piece of bread. In this case, the most informative element would be the object eaten. Similarly, if the child were applying different activities to a single object – first putting it in his mouth, then throwing it in the air – the most informative element would be the action.

(Bates 1976: 98)

Experiments similar to this in design have been carried out by Greenfield & Zukow (1978) and Snyder (1975, 1978).¹ The logic of the rule applications to child speech is straightforward; in the case where the potential choices for verbal encoding are 'object' or 'change of state' (of object), for example, the child must have sufficient vocabulary to verbally encode either element. Such features of the event as 'object' or 'state change' constitute 'informational properties of the situation' (Greenfield 1978: 445), and the set of rules embody these situational features for the prediction of the child's choice of an element for verbal encoding. The experimental manipulations are designed to be unobtrusive: 'in a sequence of events, one or more new elements is substituted for the original element(s). For instance, an animate being continues to perform the same action but interacts with a series of different objects or continues to place the same object in a succession of new locations' (Greenfield & Zukow 1978: 301–2). The experimental method is 'selective imitation', in which the mother acts out a script determined by the experimenter, describing what is occurring verbally, and the child's word use consists of imitating some portion of the mother's utterances.² This method is said to reflect the child's 'cognitive structure' and presumably his or her perception of the informational properties of the situation.

An example from Greenfield & Zukow (1978: 317) indicates how the analysis according to such predictive rules proceeds for a stretch of scripted (as opposed to spontaneous) discourse (Table 1). The discussion of these data which Greenfield & Zukow provide (1978: 317) illustrates how the language behaviour is interpreted by means of the rules:

In the above example the object, shoe, is initially taken for granted, because the child knows it will soon be in his possession. Therefore, he starts by

[1] Weisenberger (1976) and Miller (1975) have also suggested that words which are least informationally redundant given the situation are most likely to be used.

[2] An interesting problem arises when one considers that the experimental method is selective imitation, and not conversational English. If the child is attuned to the 'informational state' of a situation, it is hard to see how the adult's prior utterance does not CHANGE that state by introducing information. The child, from an information-theoretic perspective should say something DIFFERENT than what the adult said, given that imitations are informationally redundant.

imitating the predicate, a possessive (Rule 3), and then continues to encode the situation by expressing the more certain aspect (Rule 9). In the second referential event, the object type (shoe) remains constant, while the possessor changes (to father). Jason responds by expressing the variable or informative element, naming the possessor, *Dad* (Rule 14) and then encodes the constant, less informative element, saying *shoe* (Rule 9).

TABLE I

<i>Constant object, variable possessor</i>		<i>Applicable rule</i>
<i>Mother</i>	<i>Child</i>	
Handing her shoe to Jason.	Looking at mommy's shoe.	
<i>Jason, here's Mommy's shoe/</i>	[mami m]	Rule 3
<i>Here's Mommy's shoe/</i>	<i>Mommy Mom/</i>	[ʃu] Rule 9
		<i>shoe/</i>
<i>There (Grunt)</i>		
<i>There's Mommy's shoe/</i>	(intervening play and uninterpretable sounds)	
Handing father's shoe to Jason.	Looking up at father's shoe.	
<i>Jason, here's Daddy's shoe/</i>	[dae ^h (d)]	Rule 14
	<i>Dad/</i>	[ʃu] Rule 9
		<i>shoe/</i>

Since such principles or rules of informativeness apply to a 'large proportion of the children's utterances' (1978: 332) and account for 'the great majority of cases' (1978: 313) of semantic choice, for both scripted and spontaneous speech, Greenfield & Zukow conclude that for the young child, 'the uncertain, changing, informative elements are expressed first' (1978: 332). Even if the data are as robust as such statements suggest, the notion of 'informativeness' is not the powerful principle that it may appear to be in predicting children's choices of situational elements for verbal encoding. A review of the requirements for applying information theory to language behaviour will make this apparent. The behaviouristic programme for language – of demonstrating speech determination by situation – is not validated by this approach to word use. Information theory does not explain children's word uses.

THE CIRCULARITY OF 'INFORMATIVE' AS APPLIED TO SPONTANEOUS SPEECH

Before considering information theory in relation to Greenfield's approach, it is useful to reveal the reason why spontaneous speech should not serve as an

empirical test of the predictive rules. The problem is that 'informative' is defined circularly and an approach based on such data is thus 'empirically supported' only in a vacuous sense. For example, in Bates' use of 'informative' (1976: 160), the 'most informative' element of the situation is the one that most attracts the child's attention. But since what most attracts the child's attention is, by definition, what gets talked about, the phrase 'the child encodes the most informative element' says nothing more than that the child talks about what he or she talks about.

Similarly, for Greenfield, the most informative element is defined as what is most uncertain (Greenfield 1978, Greenfield & Smith, Greenfield & Zukow 1978). But 'uncertainty' is defined in terms of what the adult hypothesizes as uncertain for the child in specific types of situations. The spontaneous speech data are thus redescribed according to measures of relative 'informativeness' and 'uncertainty' that are not independently specified but dependent on the data they are intended to explain. Independent specification of the 'informative' elements of a referential speech situation is necessary, for otherwise the *post hoc* nature of the data analysis begs the issue.

This problem perhaps indicates why research with this orientation took to experiments, whereby principles of informativeness are defined IN ADVANCE of data collection.³ A circular definition of 'informative' which ensures empirical support is not the problem of experimental applications of principles of 'informativeness'. There are, however, serious difficulties with the notion of 'informativeness' itself as applied to the study of child speech which become clear when exposed to the requirements of information theory.

THE NOTION OF 'INFORMATION' IN INFORMATION THEORY

Analyses of information theory indicate that the technical uses of 'information' are inapplicable to children's word uses in the context of Greenfield and colleagues' predictive rules of 'informativeness', and that other reasons must be sought for the regularities observed in children's word uses in relation to situations. These problems are discussed in relation to two main issues: (1) the fact that an information theory for either the semantics or pragmatics of NATURAL language has never been developed, and (2) the psychological ascription of rules incorporating the notion of 'informativeness' to the child, which are said to guide the child's word choices.

In the late 1940s and early 1950s the Shannon/Wiener theory of communication, also known as 'information theory' (Fano 1950), generated a great deal of excitement in the social sciences. One primary reason for the psychologist's hopes

[3] This is not strictly true, since Rules 3, 4, 7 and 8 were 'formulated to cover unanticipated phenomena noticed after the data had been collected' (Greenfield & Zukow 1978: 313).

was that the theory provided a measuring rod for the amount of information in organized systems (MacKay 1969, Miller 1953). Imagine a game such as Twenty Questions. The player's aim is to eliminate possibilities in the most efficient manner by asking questions that reduce most greatly the number of possible outcomes. The information the player receives after hearing the answer to the question eliminates a range of possible alternatives, and hence reduces uncertainty about the outcome. In terms of information theory, for each time the number of alternatives are halved, one unit of information (a 'bit', the contracted term for 'binary digit': Fano 1950) is gained. Information theory was used to formally determine the information content of various messages, rates of transmission of messages, and the capacities of transmission channels.

The Shannon/Wiener statistical measure of information, however, is inadequate to the specific problems of word use prediction in which Greenfield and colleagues are interested. The statistical conception of information is based on the relative probabilities of sign (word) occurrences ABSTRACTED FROM THEIR USERS, and hence the probability of occurrence for a given word from a specified set of possible words. Greenfield's work is concerned with the relative probabilities of word uses by a child WITH RESPECT to the specific situation in which they are used, and the Shannon/Wiener conception of information does not speak to such word-referent relations.

Other candidates have been proposed for the 'information measure', and one might suspect that some other account of 'information' may be compatible with Greenfield's approach. In particular, Carnap & Bar-Hillel (1953) set out a measure of SEMANTIC information that related language expressions to states of a well-defined universe of objects and properties. It is important to realize that the Carnap/Bar-Hillel semantic information measure DOES NOT provide for statements in any natural language, nor does it incorporate any pragmatic account of the VALUE of information for users of a natural (or artificial) language. As Cherry (1978: 242) has indicated, 'the semantic information content of a statement ... is available only insofar as the rules of the language system are known'. For children's language (as well as adults'), such rules are currently unknown.

To understand a major difference between the Shannon/Wiener and Carnap/Bar-Hillel information measures, it is important to distinguish between statistical and inductive probability (Cherry 1978). Statistical measures of probability are such figures as the frequency with which the word *the* occurs in printed English text, and are estimates of population frequency. Inductive probabilities, on the other hand, result from someone's relevant prior knowledge and a hypothesis concerning a future state, such as a bet on Michigan State's basketball team to win the 1980 NCAA Championship. Carnap has formally defined and developed the notion of inductive probability (1950) and with Bar-Hillel (1953)

attempted to construct a formal account of semantic information content for simple declarative sentences in a finite language system.

Carnap & Bar-Hillel observed that, from a natural language perspective, the statistical definition of 'information' we have described ignores the meaning of the message which is transmitted. Miller (1954) provides an example that makes clear the difference between the statistical and semantic information measures. Given two sentences, *This is a pencil* and *This is a writing instrument*, the first is more probable in conversational English and so, according to the Shannon/Wiener statistical probability measure, contains less information than the second sentence. From the semantic perspective, based on Carnap's inductive ('logical': 1950) probabilities, however, *this is a pencil* implies that it is also a writing instrument, while *this is a writing instrument* does not convey what KIND of instrument it is (e.g. pen, pencil, teleprinter, braille-printer). The first sentence thus carries more semantic information than the second, a result that the engineering measure is insensitive to. The two measures are not contradictory, because they deal with different kinds of probability.

There are critical respects in which the two measures are alike. Specifically, the information content of a message, on both views, is INVERSELY PROPORTIONATE to the probability of the message's occurrence (Cherry 1978: 240, citing Carnap; Lyons 1977: 41 ff; Miller 1954).⁴ Hence, the more (less) predictable a message is (by the particular measure of 'probability' utilized), the less (more) information it carries. It is in the context of this definitional feature of 'relative informativeness' that the explanatory status of Greenfield and colleagues' rules for predicting children's choices of message becomes suspect. These problems are made clearer in the context of a diagram and an example. A prototypic communication setting is depicted in Figure 1. The child (A) and an adult (B) are jointly attending to the ensemble of states ($s_1, s_2 \dots s_n$) in a referential situation, and the child chooses one of those, s_1 , to verbally encode, saying ' s_1 ', the name for that state. Greenfield and colleagues simplify the situation and assume that there are two states (i.e. s_1 and s_2) in the child's choice-space, and that the child has words available which designate those states, ' s_1 ' and ' s_2 '. To take one of Greenfield & Zukow's examples (1978: 321), a child is in the process of lying down, and their Rule 6 says that 'when speaker is acting, the self as agent is taken for granted, and the action receives verbal expression'. In the terms of the diagram, make $s_1 = \text{self (the child)}$, ' s_1 ' = *me*, $s_2 = \text{lying down}$, and ' s_2 ' = *night-night*. The rule predicts that the child will verbally express action (which she did in this case), and will do so BECAUSE it is most informative. But just what does it mean for the child to be able to PERCEIVE the informational structure of a situation such as this?

[4] Similarly, for Garner (1962: 3), predictability is inversely related to uncertainty; the amount of information 'is determined by the amount by which uncertainty has been reduced'.

We are using certainty and uncertainty as they are used in information theory. That is, a nonverbal element is totally certain when it is the unique possibility in the situation. It becomes relatively more uncertain as the number of alternatives it must be selected from increases. Thus, uncertainty is in the context, and messages are informative to the extent that they allow selection of the element (entity or relation) referred to by the linguistic encoding. (Greenfield & Dent, in press)

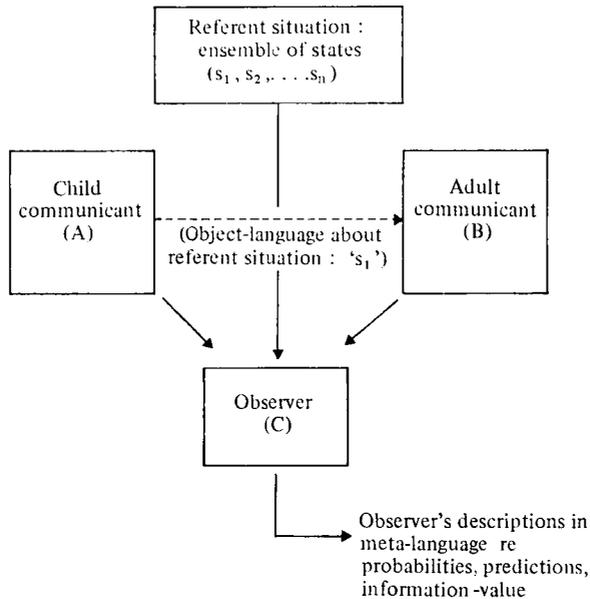


Fig. 1. External observation of a child's use of a word.
(Adapted from Fig. 3.2, Cherry (1978).)

On this interpretation, the child is said to pick s_2 , the uncertain element (since she may have done something other than lie down), and to not pick s_1 , the certain element (since she was the unique actor in the situation). The child then verbalizes the 'most informative' message, ' s_2 ' (of the set ' s_1 ' and ' s_2 ').

This account does not square very well at all with the use of 'information' in information theory. First of all, the term 'informativeness' is defined in loose PRAGMATIC terms, with reference to the value of a message for a listener (B in Fig. 1) in allowing selection of the referential element from the ensemble of states. Yet no pragmatic theory of information, with the intricacies which would be required in incorporating the belief-states of A and B and their changes over time, has ever been developed. And even the most relevant account for Greenfield and colleagues' concerns, that of Carnap & Bar-Hillel (1953), does not

incorporate statement USERS into their theory. So the allusion to a formal pragmatic information theory is based on an illusion.

Secondly, the predictive rules incorporating the informal notion of 'informativeness' have been developed by the theorist/observer (C in Fig. 1), and are described in a metalanguage. However, by hypothesis, such rules are imputed to the child as guiding principles for the selection of an element from a referential situation to verbally encode. We know very well from early imputations of mental 'grammars' to children (Brown 1973, Feldman & Toulmin 1975) that theoretical abstractions which capture regularities of behaviour are not necessarily used to generate such behaviour. In Cherry's apt phrase, we should not confuse logic with life (1978: 224). But the psychological reality of the information principle (and predictive rules) is the hypothesis of Greenfield and her colleagues, and we should consider its consequences. When subjected to the defining features of information theory reviewed above, such a view yields internal contradictions.

On information theory, as we have seen, a message ' s_x ' is informative to the extent that it is improbable. But if the child's verbal behaviour is guided by the principles of 'informativeness', she will know, in the terms of our example, that ' s_2 ' (*night-night*) is more probable in that referential situation than ' s_1 ' (*me*). To be informative, she should ACTUALLY say what is improbable, or ' s_1 '. In the information-theorists' terms, which are devoid of the psychological consequences of message transmission, the child should thus be unpredictable in her verbal behaviour to be informative! This stands in contradiction to Greenfield's claims that the rules of informativeness are based on an information-theoretic definition of 'information'. Note that the information theory accounts are also in line with the everyday-life view as to what is informative with regard to inductive probabilities: what people value is the unpredictable and exclusive, such as a 'scoop' for a news editor, or an inside tip from a professional horseracer (Cherry 1978).

On these grounds, information theory is inapplicable to children's choice of a situational element for verbal encoding, and even a common-sense view of information does not allow the theorist to rank-order the informativeness of situational elements or their verbal descriptions, as Greenfield and her colleagues attempt. But if the information value of word choices for specific situations cannot account for the child's uses of words, what alternatives will capture the regularities observed in the speech of the children Greenfield and colleagues studied?

CHILDREN'S WORD CHOICES

The analysis above indicate that whatever bases they do have, the observed predictability of children's words in defined situations do not reflect the child's

obeyance of 'rules of informativeness', A much less cognitively loaded account of the child's use of words would be an 'orienting approach', but like the proposals already reviewed, it too will not EXPLAIN the child's use of a word. Such a simple account of the child's early word choices could be connected (as Bates 1976 suggests) to well-demonstrated earlier orienting responses to novel stimuli. Such a proposal would not aim at definitively predicting the child's choice of a situational element to encode in a word (or category of words, such as AGENT), but only at suggesting *ceteris paribus* what the child is more likely to talk about. This suggestion would also be consistent with experimental findings by Snyder (1975, 1978) that 15-month-olds are more likely to use a word for a CHANGED element in a sequence of events where other elements are 'held constant'. Though Snyder, too, describes this changed element as the 'most informative', the result is consistent with the suggestion that *ceteris paribus* a child is more likely to orient to and talk about something newly introduced. The child satiates on the persistent element in the situation and when something new is introduced, it becomes a likely candidate for conversation. But as we have seen already, there is no theoretical support for equating 'new' or 'salient' with 'most informative' on any technical sense of information.

It is set in this context that the Greenfield/Bates use of the terms 'saliency' and 'attention-attracting' are less pernicious as descriptions⁵ of predisposing factors for word use. For the child may indeed orient to novel, newly introduced aspects of his or her perceptual environment, or to rapidly changing aspects of the situation, and then proceed to use one of a set of available words appropriate to the focus of the orienting response. Stripped of its technical accoutrement, the phrase 'most informative' has a sensible use as a synonym for 'most salient' or 'most attention-attracting', but it is critical to observe that no scientific explanation has taken place in this renaming exercise. Independent confirmation of what the child considers most salient would have to be derived from studies of perceptual saliency (cf. Jeffrey 1977) in which word use does not appear. No point would remain to the use of 'informative' in attempts to capture reasons for the child's use of words.

The end result of these considerations is that we do not have principles which

[5] Until now, the use of 'saliency' and 'attention-attracting' as terms for describing the child's orienting to novel stimuli has not been faulted, since our primary concern has been the unwarranted leap from 'most salient' to 'most informative'. But these terms are no less misguided in attempts at EXPLANATION (rather than description) of child language, as Bloom, Miller & Hood (1975) have shown in their critique of Braine (1974), who claims that the child's choice of words is determined by singling out something pragmatically salient. As in the use of 'most informative' here, the deduction is circular; only resulting word choices provide the evidence. Bloom *et al.* provide examples of notable omissions in early semantic-syntactic sentence structures for children, such as the dative and the instrumental, which are obviously salient in being demanded or performed by children who do not use the corresponding linguistic forms.

dictate or determine the child's uses of words, and we should not EXPECT to discover such principles. The accounts of single word 'informativeness' proposed by Greenfield and her colleagues assume that aspects of the situation EXTERNAL to the child force the choice of what gets talked about. But many INTERNAL factors, such as the child's past history of communication with the listener, current motivations and goals, fantasy-play, and so on will exert important influences on the child's choice of what to talk about. For these reasons, even the simpler 'orienting' approach alluded to earlier is oversimple, since our *ceteris paribus* clause will rarely be fulfilled.

CODA

This paper presents a critical analysis of recent attempts to explain children's word uses on the basis of inferences regarding the child's perception of information in the structure of events. Such an analysis indicated that the concept of information is NOT used in any of the technical senses provided by information theorists, contrary to what the approach claims. Simpler descriptions of children's word uses are available, which do not assume that the child extracts information from situations and then chooses a word according to its informativeness.

Though essentially negative in tone, I think these considerations are germane to current accounts of language development, particularly because we should not be deluded into thinking we understand the child's complex motivations for using words in situations. The fascinating enterprise of exploring the dynamic relations between the child's use of language and the child's perception of situations and events is an important one. But information theory is not going to provide the panacea for the intricate problems inherent in such a quest.

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