WHAT DO PEOPLE SAY AFTER THEY HAVE LEARNED HOW TO TALK? STUDIES OF THE DEVELOPMENT OF REFERENTIAL COMMUNICATION[1]

SAM GLUCKSBERG*

Princeton University

and

ROBERT M. KRAUSS

Harvard University

What do people say when they talk to one another, and what determines their choice of words? If language were a code, such that each object, event, or relationship referred to had a unique "name," then the problem of choosing a word or utterance would be reduced to determining the particular associations between referents, the things referred to, and their names. This, however, is not so. Referents (i.e., objects, events or relations) and their names do not have simple one-to-one correspondences. A referent may be referred to with any one of a number of different names and a single name may refer to any one of a number of referents. As Rosenberg and Cohen (1966) have pointed out, the "correct" name for a referent in one context may be "incorrect" in another. Thus, the attribute "correct" is used here to indicate that a particular name is useful in talking about a referent; it enables a listener to understand a speaker in a given context.

In general, a listener is said to understand a speaker if he can correctly discriminate the referent from a set of nonreferents on the basis of a message supplied by the speaker. For example, if a particular bird is the referent, then it may be called "a pigeon," "a ring dove," "*streptopelia*

* Department of Psychology, Princeton University, Princeton, New Jersey 08540.

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risoria," "the bird with a ring on its neck," "the purplish grey bird," or, if it happens to be a household pet, "Charlie." Clearly, each of these names may be "correct" in some contexts and "incorrect" in others, depending upon the particular nonreferents involved, the general context of the conversation, and the particular listener. What, then, is the nature of the capacity to communicate, and what is the course of its development?

One way of approaching this problem is to consider two extreme forms of verbal encoding: nonsocial (or unedited) communication, and social (or edited) communication. Nonsocial encoding, which we believe characterizes communicative behavior in young children (Glucksberg, Krauss, and Weisberg, 1966), bears more than a passing resemblance to free word association. The referent seems simply to elicit a verbal representational response, sampled from the hierarchy of verbal responses to that particular referent, or to some discrete aspect of that referent. Its informative value is not evaluated; it is simply emitted. In addition, a communication act of this kind is nonsocial in a second sense. It is not responsive to the utterances of the listener which, for more mature speakers, provide important clues regarding the effectiveness of the messages transmitted (Krauss and Weinheimer, 1966; Krauss and Bricker, 1967).

In contrast, social speech may be viewed in terms of an editing process. There is an initial evaluation by the speaker of the informative value of a potential overt response before it is emitted. The speaker, in George Herbert Mead's terms, takes the "role of the other." Among the variables which may affect the encoding of an adult speaker are his goals; the immediate social, physical and linguistic context; his perception of the listener; and the set of nonreferents from which the referent is to be distinguished. Following the speaker's emission of a message, the listener's utterances will, in turn, influence subsequent messages concerning the same referent. These variables, we believe, do not play as great a role in youngsters' speech as they do in that of adults. They, along with others, gain in relative importance with age.

The experimental paradigm we have developed to investigate the acquisition and growth of referential communication involves a relatively simple two-person communication game. Because the technique has been fully described earlier (Glucksberg, et al., 1966) we will discuss it only briefly here. The task requires that two people, who cannot see each other, communicate with one another about novel, low-encodable graphic designs, such as those shown in Fig. 1. These figures were selected from a larger set of similar designs because they elicited a rather wide variety of responses from a sample of adult subjects, and so can be said to be stimuli for which there are no well-standardized "popular" names (Krauss and Weinheimer, 1964). The task requires that one subject (the listener) select one of these figures (the referent) from the set of figures (the nonreferents) on the basis of a verbal message provided by another subject (the speaker).

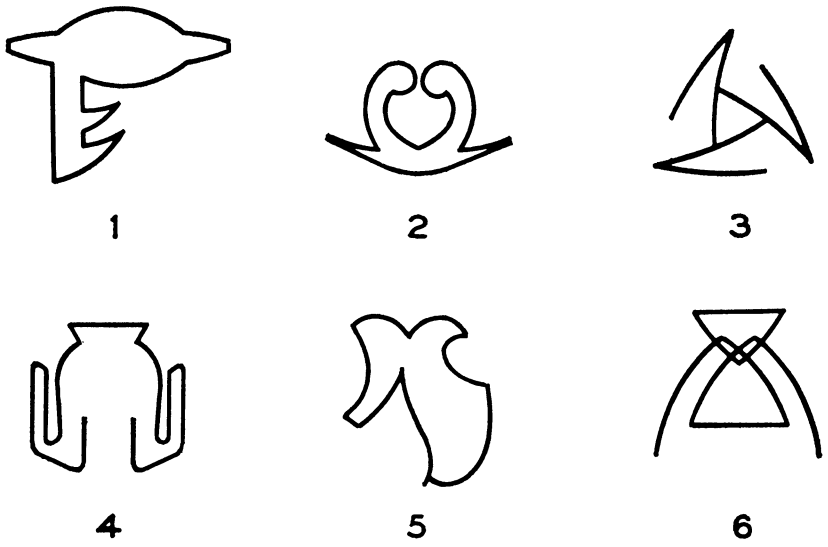

Fig. 1. The graphic designs employed.

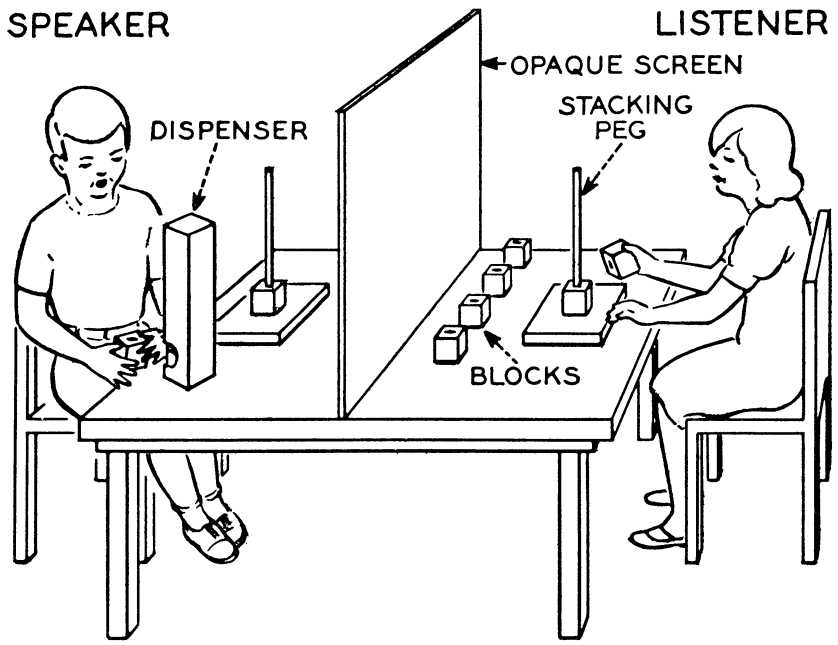

Fig. 2. The experimental situation. Although a male speaker and female listener are shown in this sketch, most of the studies employ same-sex pairs.

The specific experimental situation that we have used with children as young as 36 months, and with adults as well, is illustrated in Fig. 2.

Both speaker and listener have a set of six blocks, each of which has one design printed on the four vertical facets. Each block has a hole drilled through it vertically so that it may be stacked on a peg. The speaker has his blocks presented in random order, one at a time, from a dispenser. The listener's blocks are laid out in random order before her. Their joint task is to build matching stacks of six blocks each on the pegs provided. The speaker takes a block from his dispenser, stacks it on his peg, and concurrently tells his listener which of her blocks to stack on her peg. Each six-block stacking constitutes a trial. Both speaker and listener are told that they have the same blocks, and that they may communicate freely.

Before turning to some characteristics of children's behavior in this setting, it would be useful to consider what adults do in this task. Adult performance, of course, is the standard of competence which children, in our culture, must achieve. In terms of accuracy, adult performance, within the normal I.Q. range, is essentially error-free on Trial 1. At the other extreme of competence, nursery school children, who can play the game perfectly provided the stimuli are easy to encode (for example, with colors, or pictures of familiar animals), display random matching when the novel forms are used (Glucksberg, et al. 1966). The names they give the figures are typically short, idiosyncratic, and invariant over trials, despite knowledge of results.

Between these two extremes, our task discriminates smoothly through the age range, yielding, for example, smooth changes in accuracy scores as a function of age of speaker, as well as age of listener. Figure 3 illustrates the kind of data we obtain with matched age pairs. Figure 4 is a sample of accuracy data obtained in a study employing both mixed and matched age pairs. This sample is for kindergarten speakers with kindergarten, third-grade, and fifth-grade listeners.

One aspect of younger children's behavior that we had observed in these earlier studies involved the reaction to a listener's feedback concerning message understandability. We had hypothesized earlier that in nonsocial encoding the speaker's "name " for a referent is essentially unaffected by his listener's post-message utterances. This notion is consistent with Piaget's concept of nominalism: the tendency to treat a "name" as an integral attribute of an object, an attribute which is invariant and not subject to arbitrary change. With these ideas in mind, we conducted a study to examine speaker's responses to listener feedback as a function of age.

Kindergarten, first-, third-, fifth-grade children, and college students, were assigned the role of speaker in our two-person communication task, with an adult experimenter playing the listener role. On the first trial with the novel graphic designs, the experimenter said "OK," indicating understanding, after the description of the first, third, and sixth blocks. After

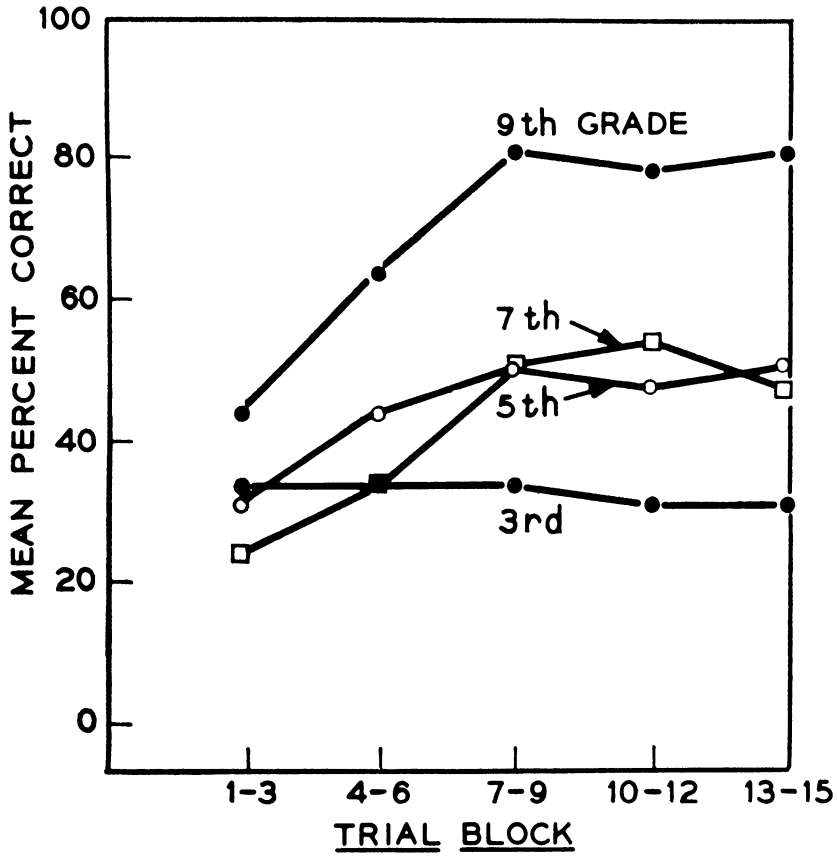

Fig. 3. Communication accuracy as a function of grade and trials.

the description of the second, fourth and fifth block, the experimenter said to 12 of the subjects in each age group, "I don't understand which one you mean." To another 12 subjects in each age group he said, "Tell me more about it." And to a third group of 12 subjects he said, "I don't understand which one you mean; tell me more about it."

Since these three different messages made no difference in the behavior of Ss, the Ss were pooled within age groups. The data indicate that younger children, in addition to displaying limited response repertoires, failed to edit, i.e., they did not modify their messages in socially appropriate ways. Figure 5 presents some of these data. Each bar represents the percentage of subjects in each age group who, on at least one occasion, displayed one or more instances of behavior falling into each category. The

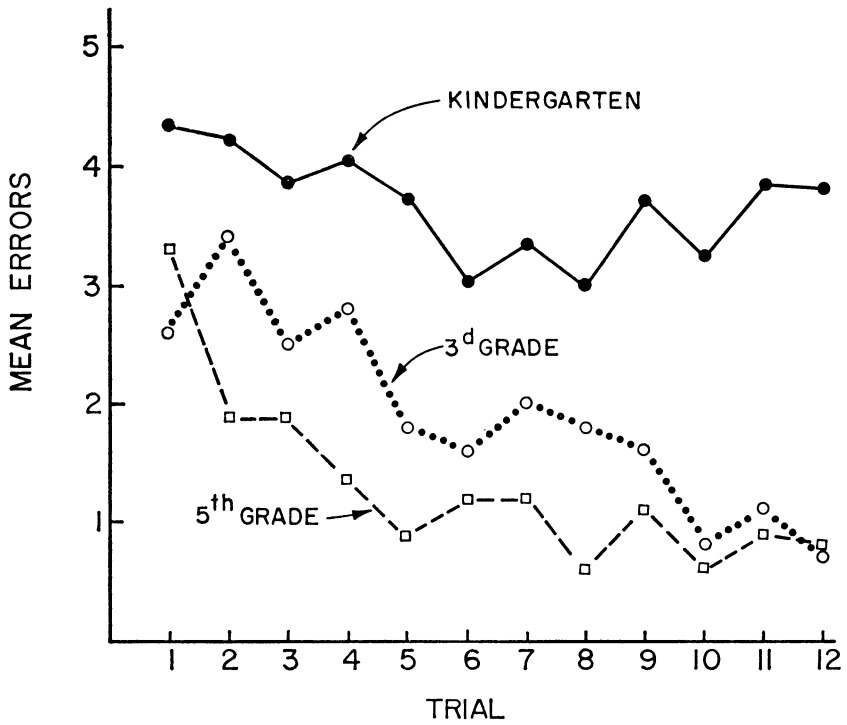

Fig. 4. Communication accuracy as a function of grade of listener with kindergartner speakers.

first category, *New Description,* refers to a post-feedback description which likened the referent to a different object. That is, if the initial, pre-feedback description was "it's like a boat"; the second might be "it's like a hat." *A Modified Description,* given the same initial description noted above, might be "a boat with a motor on the back." The other two categories are self-explanatory. Clearly, socially appropriate behavior, as measured by these indices, increases with age. The data on "pointing" (not shown here) are particularly revealing. Only kindergarteners and first-graders "point"—that is, said things like "it goes like this," while tracing the design with a finger. The inappropriateness of such a response is clear if one remembers that speaker and listener cannot see each other.

Other data obtained in this study, which includes statistical-linguistic indices such as type-token ratios, and independent estimates of the information value of both pre- and post-feedback messages, support the general conclusion that, limited response repertoires aside, one or more forms of social editing develops with age. This postulated editing process is not,

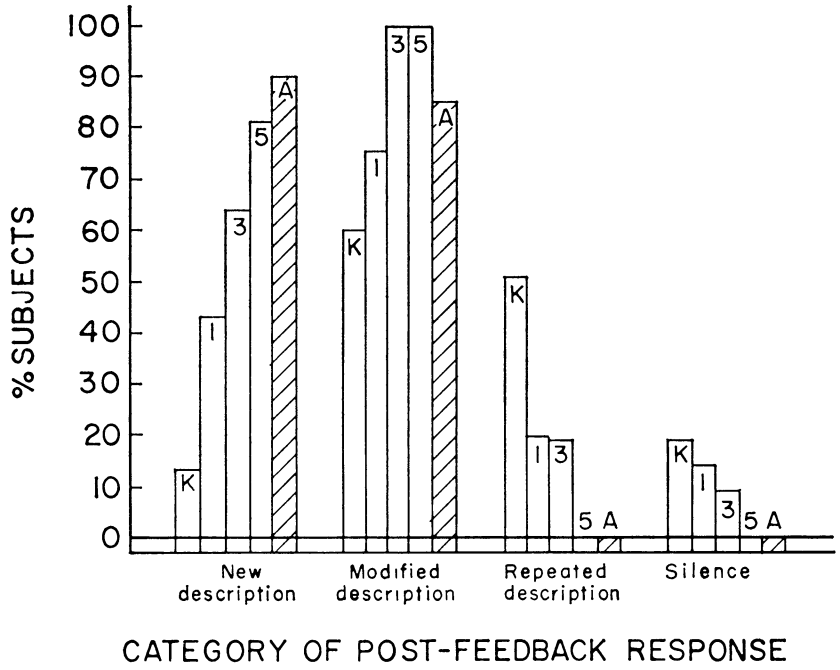

Fig. 5. Response to feedback as a function of grade.

of course, independent of other cognitive processes which change with age and experience. Included among our plans for the future are investigations of the relationships between particular forms of editing and selected cognitive abilities. Of immediate concern is the specification of the kinds of editing processes that are necessary to account for communication behavior at various age levels, and explorations of the effects of various experimental manipulations upon the occurrence of these editing behaviors.

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