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TRAINING REFERENTIAL COMMUNICATION SKILLS

Steven R. Asher and Allan Wigfield

University of Illinois at Urbana-Champaign

July 1980

Center for the Study of Reading

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Abstract

This paper reviews the research on the training of children's referential communication ability. Two approaches to such training can be distinguished, the role-taking approach and the task-analytic approach. In the role-taking approach, researchers attempt to improve children's communication accuracy by training them to be more sensitive to listener needs. In the task-analytic approach, researchers teach specific skills thought to be relevant to performance on various communication tasks. Efforts to improve children's communication performance by role-taking training have had mixed results. We report results from our task-analytic training research, which focused on teaching children to engage in comparison activity. Results showed that the training improved children's communication performance, indicating that inadequate comparison processing contributed to children's poor communication performance. The problem of obtaining generalization effects of training is considered, and suggestions are made regarding ways to integrate the role-taking and task-analytic approaches.

Training Referential Communication Skills

In this paper we examine research on the training of referential communication skills. To provide a context for this review, we first summarize the two major theoretical approaches to the study of children's referential communication ability. One approach, the egocentrism perspective, attributes communication failure to young children's inability to take the role of the listener. The other approach, a task-analytic perspective, emphasizes children's difficulty in coping with the specific demands of various communication tasks. After examining these approaches, we review research on the training of communication skills, most of which is derived from the role-taking perspective. Following discussion of these studies, a series of training experiments is presented that we conducted from a task-analytic perspective. The paper concludes with a discussion of ways to integrate the role-taking and task-analytic research traditions.

Theoretical Accounts

The Egocentrism Explanation

Children's referential communication performance improves over age (Glucksberg, Krauss, & Higgins, 1975), but the developmental changes that underlie improvement are just beginning to be understood. Various skill acquistions have been hypothesized to contribute to the development of children's competence. One widely held view is that the growth of communication accuracy is a function of the decline of childhood egocentricity. According to this view, as children grow older, they become more

aware of the need to take the listener's role and the necessity of providing messages which meet the listener's informational needs.

This view stems from Piaget's work (Piaget, 1926), and has been elaborated by Flavell and his associates (Flavell, Botkin, Fry, Wright, & Jarvis, 1968). Piaget contended that communication develops from the egocentric speech of childhood to the socialized speech of adulthood. Childhood speech is not intended to meet listener needs and is thus not adapted with the listener's perspective in mind. Adults, on the other hand, communicate with the intention to inform and recognize that the listener lacks information known to the speaker. Flavell and his colleagues (1968) term this ability to accommodate to the listener's informational needs "role-taking skill." In the view of Piaget and Flavell et al., development of the ability to take the other's perspective is a main component in the development of good communication skills.

In early studies of referential communication accuracy (e.g., Alvy, 1968; Glucksberg, Krauss, & Weisberg, 1966; Sullivan & Hunt, 1967), the egocentrism explanation was adopted to explain young children's communication failure. More recent research indicates, however, that this approach inadequately explains communication skill development (Asher, 1979). First, there is considerable evidence that even very young children alter their message content depending upon the particular listener they are addressing. Preschool children give different kinds of messages to adults than to young children (Shatz & Gelman, 1973), to a blindfolded than to a sighted listener (Maratsos, 1973; Meissner & Apthorp, 1976), and

to a listener who is knowledgeable about a game than to a naive listener (Menig-Peterson, 1975). This suggests that even children in Piaget's preoperational stage are capable of taking the listener's perspective.

Second, it appears that even when children fail to communicate adequately, their poor performance cannot be readily explained in terms of children's egocentrism. For example, the egocentrism formulation leads to the prediction that children's messages may have private meaning even though their messages lack public meaning. Asher and Oden (1976) tested this prediction by examining whether children's messages would have meaning for themselves when the messages were not meaningful to others. Results indicated that children whose messages provided little information to an adult listener also were unable to effectively use their own messages to select referents. This finding implies that children lack skills other than the ability to analyze listener characteristics.

Third, a large number of studies have examined the correlation between role-taking skill, as directly measured by various tests, and communication accuracy. Although children improve as they grow older on both the role-taking and communication tasks, the correlation between these two kinds of tasks is usually modest or low (e.g., Coie & Dorval, 1973; Johnson, 1977; Piché, Michlin, Rubin, & Johnson, 1975; Rubin, 1973; Kingsley, Note 1; Shantz, Note 2). This implies that role-taking and communication tasks are assessing different skills.

Thus, a variety of sources of evidence indicate that the role-taking approach provides an inadequate account of the development of communication accuracy. We believe that there are two basic problems with this approach. One is the global nature of the role-taking construct. Most research on egocentrism and communication has proceeded without a clear conceptualization of the component skills that constitute role-taking ability. Often, role-taking ability is equated with simply being aware that listeners have different perspectives from one's own. As will be discussed later, there are other important elements of role-taking skill. The second problem is that there are other skills relevant to accurate communication that are ignored in the role-taking approach. A task-analytic model, considered next, gives attention to different sorts of skills.

The Task-Analytic View

The task-analytic view emphasizes the child's ability to cope with the specific features inherent in various communication tasks. Communication tasks vary in the demands they make upon speaker skills. For example, the task of giving someone directions to a location requires somewhat different skills than the task of teaching someone the rules of a board game. Nonetheless, most tasks have certain features in common. Rosenberg and Cohen (1966) have proposed a two-stage model of communication which attempts to specify the processes that are required in many communication tasks. Rosenberg and Cohen contend that given the task of communicating a referent, the speaker first samples a response

from a hierarchy of word associations to the referent. The probability of sampling a response is said to be proportional to its occurrence as a word associate. Next, the speaker is said to compare the sampled response to both the referent and potential nonreferents. If the associative value to the referent is greater, the message is likely to be emitted; if the value is smaller, the message probably will be rejected and another cycle of sampling-comparison activity begun.

This model suggests the relevance of certain cognitive processes to the development of communication effectiveness. First, improved performance over age could be due to the acquisition of a more elaborate vocabulary or knowledge-base from which to sample a response. As children's knowledge of the world increases, they would be better prepared to communicate increasingly subtle distinctions. Second, children's improved communication performance over age could be due to increased awareness of the need to engage in comparison activity. Young children may be more likely to treat the communication task as though it simply requires an adequate association to the referent. Older children may be more likely to consider nonreferents as well as the referent when formulating a message.

There has been little research on the contribution of vocabulary development or world knowledge to the development of communication effectiveness. However, a growing number of studies have examined whether children engage in comparison activity on referential tasks (e.g., Asher & Parke, 1975; Asher, 1976; Bearison & Levey, 1977; Whitehurst, 1976). Asher and Parke (1975) had second-, fourth-, and sixth-grade children

communicate messages for word pairs in which the referent was dissimilar to the nonreferent (e.g., run-bake) and for word pairs in which the referent and nonreferent were similar (e.g., ocean-river). On the latter type of word pair, comparison activity is required to ensure that the message generated is more highly associated to the referent than the nonreferent. On the dissimilar word pairs, no comparison activity is needed. Asher and Parke found that children at each grade level gave adequate messages on nearly all of the dissimilar word pairs. However, on the similar word pairs, older children were significantly more accurate than the younger children. These findings suggest that younger children were failing to meet the demand for comparison activity posed by the similar word-pair task.

Evidence that younger children fail to engage in comparison activity also can be found in recent studies of children's message-appraisal ability. Asher (1976) asked second-, fourth-, and sixth-grade children to evaluate a standard set of 12 messages. Six of the messages were effective in that although they were only moderately associated to the referent, they were completely unassociated to the nonreferent. The other six messages were not effective in that they were highly associated to both the referent and the nonreferent. In contrast to the communication task, this appraisal task required no message production; children simply had to recognize which messages were effective and which were not. Results indicated that younger children did significantly worse than older children on the good clue and poor clue appraisal tasks.

Further evidence that children do not adequately engage in comparison activity comes from the Robinsons' work on message appraisal (Robinson & Robinson, 1976a, 1976b; Robinson, in press). On their task, children evaluated whether the speaker or listener was to blame when a message was not understood. The task was actually structured so that the speaker was to blame in all cases, in that the speaker's message referred to both the referent and the nonreferent. Results indicated that five-year-olds tended to blame the listener for the failure, whereas children seven years and older correctly blamed the speaker. The Robinsons concluded that one reason why younger children do not adequately assess messages is that they do not compare the information in the message to each potential referent.

Whitehurst and his colleagues (e.g., Whitehurst, 1976; Whitehurst & Sonnenschein, 1978) have also investigated the extent to which children engage in comparison activity. Whitehurst has used a triangle description task in which the number of critical features distinguishing one triangle from another can be controlled. Three types of messages can be identified with this task: those that are incomplete because they fail to mention the critical attribute; those that are redundant in that they include both essential and nonessential information, and those that are truly contrastive in that only the critical attributes are mentioned. Whitehurst (1976) showed that children were more likely to produce contrastive messages when there were only two items in the display, the referent and the nonreferent. With two nonreferents, production of contrastive messages

declined. In addition, Whitehurst found that older children, even though they produced discriminative messages, did not attempt to give the most efficient messages (contrastive ones), but instead gave more redundant messages. Similar results occurred in a second experiment in the same report. Children who heard a model produce contrastive messages showed a stronger increase in redundant than in contrastive messages. Apparently, children learned that their messages must distinguish the referent from nonreferents, but they followed the path of "least effort" in that they produced redundant rather than contrastive messages.

The task-analytic perspective has also been used to study the correlates of communication accuracy. One would expect communication performance on referential tasks in which the referent and nonreferent are similar to correlate with performance on other tasks that require comparison activity. We have begun to examine the correlation of communication accuracy with two other tasks. One is the Matching Familiar Figures (MFF) task developed by Kagan and his colleagues (Kagan, Rosman, Day, Albert, & Phillips, 1964) to study children's tendency to respond impulsively versus reflectively. The child is shown a picture and is asked to find the identical picture in a set of six highly similar alternatives. This task requires that the child carefully scan the alternatives in order to select the identical match rather than one of the similar "distractors." In a pilot study, children's accuracy on the word-pair task correlated significantly with MFF accuracy; it seems that children who engage in comparison activity on one task are more likely to engage in a scanning process on the other.

Another task that presumably requires comparison activity is the multiple-choice reading achievement test. Here the child reads a paragraph and is presented with a test question and four alternative answers. One alternative is the correct answer, and one or more alternative is often quite similar and could easily be mistaken for the correct answer. The problem for the child is to avoid selecting the first answer that seems attractive and to compare among the alternatives. Wigfield and Asher (1978) correlated multiple-choice test reading achievement scores with communication accuracy on the word-pair task. The correlation approached significance in third grade, $r(18) = .43$, $p < .10$, and was significant in fifth grade, $r(14) = .57$, $p < .05$.

These data suggest that similar processes may contribute to performance on multiple-choice achievement tests and referential communication tasks. Further research is needed to determine the extent to which comparison processing, in particular, is an important contributor to performance on multiple-choice achievement tests as well as referential communication tasks. If younger children's achievement test performance is affected by deficiencies in comparison processing, then their performance should be particularly affected by the placement of the correct alternative within the multiple-choice array. Dickson (1979) has recently reported that the placement of the referent in a stimulus display affects the probability that young listeners will correctly select the referent. It seems plausible that a similar finding would be obtained on multiple-choice test performance.

To summarize, research from a task-analytic perspective suggests that comparison activity is an important component of communication accuracy and that children increasingly engage in comparison activity as they grow older. Various studies have demonstrated the conditions which influence whether children engage in comparison processing. Finally, there is evidence that the task-analytic perspective leads to successful predictions regarding the correlates of referential communication accuracy.

Training Children's Communication Skills

The research reviewed thus far has employed a developmental-descriptive methodology. In this type of study, children of different ages communicate messages on one or more tasks or under one or more conditions. Investigators then make inferences about the types of skills that contribute to developmental changes in communication accuracy. An alternative research strategy for identifying skills that contribute to children's communication development is the training methodology. Hypotheses about the skill deficits that underlie communication failure can be experimentally tested by teaching a specific skill and observing the effects on subsequent communication performance. If children's communication performance improves following training, then it can be inferred that the trained skill is relevant to accurate communication and that children were initially lacking in that skill.

The utility of a training research strategy rests upon the careful specification of the skills to be trained. It does little good, from a theoretical perspective, to improve communication performance if little is

learned about the specific skill deficits that were remediated. Confident interpretation of training studies also depends upon the utlilization of teaching procedures with known effectiveness. Without the use of such procedures, failure to produce improved communication performance could be interpreted as being due to poor teaching procedures rather than inappropriate selection of skills.

The Role-Taking Approach to Communication Training

Referential communication training studies have primarily emphasized the importance of role-taking skill (Chandler, Greenspan, & Barenboim, 1974; Fry, 1966, 1969; Shantz & Wilson, 1972). These training studies have had limited success in producing changes in communication performance. More important, even when improvement in performance is obtained it is not clear what particular skill deficits were remediated. In order to understand why the studies have produced unclear results, each will be considered in detail.

The first training studies were conducted by Fry (1966, 1969). Since the two studies were similar, the latter (Fry, 1969) will be described. Fry based his study on Piaget's contention that it is the disconfirmation of one's own perspective, mainly by peers, that fosters role-taking skill. Fifth-grade children were given a pretest and posttest on various speaker communication tasks which involved distinguishing referents from various nonreferents. Half of the children received training between the pretest and posttest. They met in groups of six or seven for an hour a week over a six-week period. During each hour, children alternated in the

speaker and listener roles. Following each child's performance as a speaker, a tape recording of the child's message was played back, and listeners criticized the message and indicated other possible messages that might have been sent. As in Fry's (1966) earlier study, the results indicated few positive effects of training.

A number of factors may explain the weak training effect. First, the age group chosen (11 years old) may have been fairly skilled prior to training. A training study is more likely to be effective with children who do not have fully developed skills. A second difficulty lies with the use of peers as a source of feedback. No control over the quality of peer feedback was provided nor was any assessment made of the quality of feedback given by peers. The most basic problem with the study, however, was the lack of prior articulation of relevant skills. Even if the training had resulted in improved performance, it would have been impossible to determine what communication skills had improved, given the nature of the training procedure.

Shantz and Wilson (1972) also investigated whether communication skills can be improved through training children to be more aware of listener needs. However, unlike Fry, they were less interested in the role of peer feedback, and more concerned with the development of a controlled "curriculum." Shantz and Wilson worked with seven-year-olds because research by Piaget and Flavell indicated that age to be one of rapid transition in communication skills.

The research design was as follows. Children were randomly assigned to either the training or control conditions and were pretested. Children in the training condition then received six one-half-hour sessions; in each session the children served as speaker, listener, and listener-observer. The experimenter actively questioned listeners and observers about message adequacy and encouraged constructive peer criticism. As part of the training procedure, the children communicated the same referent on two tasks, a description and a discrimination task. On the description task, the child had to describe a referent so that a listener could draw it. On the discrimination task, this same referent appeared in the context of nonreferents that differed on a number of dimensions (size, color, position, and shape). The child's task was to provide a message that discriminated the referent from the nonreferents.

Following training, children received the posttests which, in addition to the training tasks, included generalization tasks: a checkerboard task, in which the speaker tried to communicate so that a listener could place six objects in certain positions on a checkerboard; the novel forms task of Glucksberg et al. (1966), and a persuasion task used by Flavell et al. (1968); in which the child was asked to try to sell a tie to a prospective buyer. Results on the training tasks showed that both the training and control children improved significantly on description and discrimination tasks, with improvement of the training group significantly greater than that of the control group. Results from the generalization tasks were mixed. On the checkerboard task, the two groups did not differ in the

amount of information judged useful; however, the training group was significantly superior on listener accuracy. On the novel forms task, the two groups did not differ on total errors but showed significant differences on the last trial in favor of training subjects. Finally, on the persuasion task, children in the control group actually gave more arguments and more types of arguments than children in the training group.

From these results, Shantz and Wilson concluded that training produced improved performance on description and discrimination tasks, generalization to tasks similar to those used in training (the checkerboard and novel form tasks), but no generalization to a highly dissimilar task (the persuasion task). There are difficulties with this interpretation. The ambiguity of findings on both "near-generalization" tasks (checkerboard and novel forms) and the reversal from expectation on the "far-generalization" persuasion task is not convincing evidence for generalization. Also, it is not clear whether the significant effects that did occur were due to training or simply to practice alone. The improvement of the control group on the description task suggests that "descriptive ability may improve substantially with minimal repetition and no feedback" (Shantz & Wilson, 1972, p. 697). This result suggests the necessity of including comparable practice opportunities in the control condition, which Shantz and Wilson did not do.

Assuming, however, that training was responsible for the training group's relative improvement, it is not clear what skills were learned.

Shantz and Wilson suggest that the procedure of including the same standard card for discrimination and description tasks may have alerted children to the importance of attending to listener needs. However, providing multiple attributes (e.g., size, color, position, shape) may have shown children that communication requires discriminative messages. Further, the training may have alerted children to certain dimensions such as size and color for making discriminations. Since the training procedure was complex, it is impossible to choose among these various possibilities.

The Shantz and Wilson study suggests that practice, or practice and feedback, can be effective in improving children's referential communication ability. A study by Chandler et al. (1974) points in a similar direction. Emotionally disturbed, institutionalized children aged nine to fourteen years were divided into three conditions: a role-taking training group, a referential training group, and a nontreatment control group. The role-taking training consisted of working in a group with other children to produce videotaped dramas. The rationale for this procedure was that the production of dramas would provide children with practice in stepping outside their own role and in assuming different roles or perspectives. The referential communication training group practiced and received feedback on a variety of communication tasks. This training did not include any formal or didactic communication skill training. Instead, it was intended that the children find and correct their own errors. The control group received neither role-taking nor referential communication training.

Results indicated that the group receiving referential communication practice and feedback made sizable gains on the posttest communication measures, and these gains were significantly greater than those of the role-taking and control groups. Role-taking training produced gains on the communication measure that were no different from the gains in the control condition. This suggests that a better conceptualization is needed of the role-taking skills to be trained and of the links between role-taking training procedures and the objective of improved communication accuracy. Without a more adequate conceptualization, it is not likely that future role-taking training will greatly improve communication accuracy.

In summary, studies in which the goal was to train role-taking skill have not been very successful in improving children's communication skills. These results demonstrate in another way that the role-taking explanation provides an inadequate account of the development of children's communication skills. When success has occurred, it was due primarily to practice on various communication tasks, followed by unstructured feedback from either the experimenter or same-age peers. The problem with this approach is that it is difficult to specify exactly what children have learned, and thus any improvement in their communication performance is open to a number of alternative explanations.

The Task-Analytic Approach to Communication Training

The task-analytic approach has only recently been used as a framework for the design of training studies. As discussed earlier, the developmental-descriptive studies conducted from this perspective suggest

that young children's poorer communication performance results in part from failure to engage in comparison activity. Elementary-aged children should be able to make such comparisons; however, they may not be aware that it is important to do so on referential tasks. Thus, teaching children to be aware of the importance of comparing messages to both the referent and the nonreferent should improve their communication performance.

We will describe three training studies we conducted, each concerned with the effects of comparison training on children's communication accuracy. All three experiments examined the immediate effects of training on the task used during training. The first study also assessed whether training effects were maintained over time, and whether the effects generalized to another referential task. In the second study, the major issue assessed was whether children's communication performance is constrained by difficulties in thinking of particular messages, even when children understand the importance of comparison activity. In the third experiment, the main issue was again whether training effects generalized to another referential task. We will also briefly describe a fourth training study in which we further attempted to examine generalization effects. Because the procedures used in this study differed from the other three, the study will receive separate attention in the section on generalization effects of training.

The Comparison Training Procedure

As discussed earlier,the success of a training program depends not only on the program content (i.e., the skills to be trained), but also on

the teaching methods employed. The training procedure used in our research was derived from the modeling plus self-guidance statement procedure used by Meichenbaum and Goodman (1971). This method consists of three components: the child sees a model who overtly verbalizes the correct problem-solving strategy; the child has an opportunity to practice the strategy; and the child then receives feedback. Meichenbaum and Goodman used this procedure to successfully train impulsive children to more carefully scan arrays on the Matching Familiar Figures task. The success of their training procedure and the seeming similarity of scanning to comparison activity made the modeling plus self-guidance statement procedure attractive for our purposes.

The procedure for the training conditions in the studies was generally as follows: Children were first pretested on a set of word pairs, each consisting of a referent and nonreferent that had similar meanings. Children communicated their messages for an imaginary listener, a procedure that has been used frequently in previous studies (e.g., Asher & Parke, 1975; Shantz & Wilson, 1972, Kingsley, Note 1) and which poses no conceptual difficulty for elementary-school children. After the pretesting, children received training, which consisted of watching a videotaped model communicate clues for ten word pairs, practicing giving clues for ten word pairs, and receiving structured feedback from the experimenter about message adequacy. The word pairs used in training were different from both the pre- and posttest word pairs.

The experimenter began the training with the following instructions: "I'm here to help the kids in your class learn how to do well on games like this. But before we practice I want to show you a person doing the word pairs. I want you to pay close attention so that you will learn the best way to play the game, okay?" The child then saw a modeling film depicting either an adult male (for boys) or adult female (for girls) generating clues for word pairs. The model's script for the first word (child-baby) was as follows:

> "Let's see, there's child and baby and baby has a line under it. How about play as a clue? A baby plays. No, that's no good, because a child plays too, and the person won't know which word has the line under it. How about mother, because a baby has a mother. No, a child has a mother too. Oh, I've got one. Rattle. Because a baby plays with a rattle and a child doesn't. Rattle.

After the model selected a clue for the first pair, the child was asked to give a clue for the first practice pair. The following instructions were given: "Okay, now you try one. Think out loud just like the person on T.V. I'll help you if you need help." When the child gave a poor clue, the experimenter said: "No, that might not be a good clue because....Try again." After two unsuccessful tries by the child the experimenter said, "No, that's not a good clue because....Let's go on to the next pair." When the child gave a good clue the experimenter said: "Yes, that's a good clue because....Let's go on to the next pair."

The modeling, practice, and feedback continued in a similar fashion for six word pairs for both the model and the child. For the next four word pairs, the model was seen thinking to himself or herself and then emitting a good clue. For example, on the seventh word pair, the model said, "There's crayon and chalk and crayon has a line under it. A good clue is wax. Wax." Before the child gave a clue for the seventh practice pair, the experimenter said, "Now do it like the person on T.V. Think to yourself and come up with a good clue." After the child gave a clue, the experimenter gave feedback as above. This procedure continued until the model and child had each given three more clues, for a total of ten clues each.

Design of the Training Studies

The first experiment using this comparison training procedure was conducted with third- and fourth-grade children, and the other two experiments were conducted with fourth-grade children. In each of the studies, children were divided into two groups: a training group that received the modeling plus self-guidance procedure, and a practice-control group. Children in the practice-control group practiced on the same word pairs used in the training condition but received no comparison training. In this way, the effects of modeling and feedback could be separated from other effects such as practice or familiarity with the experimental situation. In all three experiments, children were first pretested with one set of word pairs, Set A. (See Table 1 for each set of word pairs.) As a

posttest measure, children produced clues for ten word pairs unrelated to those used in the training and practice-control conditions. In Experiments 1 and 2, Set B was used as a posttest measure and in Experiment 3, Set C was used. In all three experiments, children's clues were scored by having three adult judges evaluate the adequacy of each clue. (See Asher, 1976, and Asher & Oden, 1976, for the rationale for this type of scoring procedure.)

Insert Table 1 About Here

Experimental Findings

Immediate effects of training. To assess immediate posttest performance in each study, an analysis of covariance was performed using the Set A pretest scores as the covariate. Table 2 presents the adjusted posttest scores. In each study, children in the training condition performed significantly more accurately than children in the practice-control condition. These results support the hypothesis that teaching children to engage in comparison activity on the word-pair task improves their communication accuracy.

Insert Table 2 about here

Maintenance of training effects. One month after training, children in Experiment 1 were tested again on two additional 10-item word-pair

sets. One was Set A, the word pairs that had served as the original pretest and the other was Set C, an entirely new group of items that had not been seen by the children before. Children in the training condition again communicated significantly more effectively than in the practice-control condition (3.56 vs. 2.59 for Set A, and 5.13 vs. 3.52 for Set C).

Alternative explanations of low communication accuracy. The results presented thus far demonstrate that comparison training is more effective than practice alone and that the effects of training are maintained over time. The results provide support for the task-analytic approach in that teaching children a task-specific strategy facilitated their performance. However, children's performance was still low relative to the total possible score on each set of items. Even on the easiest set of items, Set C, children who received training averaged only 5.13 out of a possible 10 correct in Experiment 1, and 6.79 in Experiment 3. Thus, the comparison training did not lead to high scores. One possibility is that children simply failed to engage in comparison activity on some items. Another possibility is that children consistently engaged in comparison activity but still had difficulty generating appropriate messages, due to other factors such as their knowledge of the items used in the word pairs.

These alternatives were evaluated in Experiment 2 by testing children on a message-appraisal task as well as on the message-production task. The appraisal task consists of 12 word pairs and potential clues (see Asher, 1976, p. 22). Six of the clues are good in that they are more highly associated to the referent than the nonreferent, and six of the

clues are poor in that they are highly associated to both the referent and the nonreferent. For each item the child's task was to say whether the clue would help a listener, who did not know which word is underlined, to pick the correct word. The appraisal task provides a more sensitive test of a child's understanding of the comparison concept than does a message-production task. It makes fewer demands on children's knowledge since the clues were chosen to reflect the world knowledge of middle-elementary-school children. Good performance on this task in combination with relatively low performance on the word-pair task would suggest that children did learn the comparison concept but were constrained by other production factors. Relatively low performance on both tasks would suggest that children did not learn to engage in comparison activity.

Results indicated that children in the comparison training group did significantly better than children in the practice-control group on both good clue appraisal accuracy (5.57 vs. 4.71) and poor clue appraisal accuracy (4.92 vs. 2.99). Note that children's scores in the training group were relatively close to the highest possible score of six on each subset of items. These data suggest that children learned the importance of engaging in comparison activity

To provide perspective on children's performance, we collected data on adults' communication and appraisal ability. College students received no training but simply gave clues for each word-pair set and appraised the good and poor clues. Adults' scores on the good clue ($\underline{M}$ = 5.55) and poor clue ($\underline{M}$ = 5.86) appraisal sets are similar to trained children's scores. On

the communication production task, the average score for adults was 5.13 on Set A, 5.06 on Set B, and 8.06 on Set C. These data indicate that many of the items were difficult even for competent speakers and that children's performance following training approached the level of adult performance.

Why might children have learned the comparison concept yet still have achieved relatively low scores on the message-production task? Perhaps children lacked specific strategies for generating clues. A second session in Experiment 2 was designed to investigate this issue. Children who had received comparison training in the first session were matched based on posttest scores and randomly assigned to either a "comparison reminder" condition or to a "comparison reminder plus strategy training" condition. In the latter condition, children were taught two specific strategies for generating messages: first, to think of a word that goes with the referent in a sentence; and second, to think of an example of the referent. These two strategies were selected based on an examination of the types of effective clues speakers gave in our earlier research. If children's communication performance was constrained by their lack of strategies for generating messages, comparison plus strategy training should improve performance beyond the level of comparison training alone. The results provided partial support; girls' communication performance improved significantly as a result of this strategy training but boys' performance did not. One possibility is that girls had a more adequate vocabulary repertoire and were better able to utilize the strategies that were taught. This

hypothesis could be assessed in future research by testing children's knowledge of the particular lexical items used in the word pairs. It could then be examined whether children with the most knowledge benefit most from comparison and strategy training.

To summarize, the appraisal data show clearly that the comparison-training procedure was quite effective in teaching children to appreciate the need to attend to nonreferents as well as referents in formulating a message. Children in the comparison-training condition were quite adept at evaluating the quality of both good and poor messages. What accounts, then, for trained children's relatively low performance on the communication task? Tentatively, it appears that some children lack specific strategies for thinking of clues, and others may be limited by their knowledge about the various word-pair items. Also, the word-pair task appears to be quite difficult, even for adult speakers. Thus, the present findings qualify to some extent our earlier conclusions that emphasized the importance of inadequate comparison processing as the reason for young children's communication ineffectiveness (e.g., Asher & Parke, 1975; Asher, 1976). The discrepancy between children's communication accuracy and appraisal accuracy scores, along with the "example" and "sentence" rules training data, suggest that other message production factors also play an important role.

Generalization of training. As discussed earlier, previous attempts to achieve generalization of training in the communication literature have met with limited success (e.g., Fry, 1966, 1969; Shantz & Wilson, 1972). One

problem in assessing generalization effects of training is the selection of appropriate transfer tasks (Brown, 1978). From a task-analytic perspective, not all communication tasks could serve as tests of generalization of training. Our criteria for selecting generalization tasks were two-fold. First, the task should require that children engage in comparison activity; that is, the referents to be communicated should appear in the context of highly similar nonreferents. Second, features of the generalization task, while different from the training task, should not place demands on the speaker that override the speaker's ability to manifest his or her comparison ability.

The issue of generalization of training was initially examined in Experiment 1. At immediate posttest, children were given a snowflake description task adapted from one used by Rosenberg and Markham (1971). The speaker was shown a series of ten pairs of snowflake photographs, one pair at a time. The snowflakes in each pair were highly similar in appearance, and one of the two snowflakes was designated as the referent. The speaker's task was to provide a message of any length that would enable a listener to select the referent in each pair. Like the word-pair task, the snowflake description task requires speakers to engage in comparison activity; speakers must ensure that their messages are more highly related to the referent than to the similar nonreferent. The results for this task indicated no significant difference between children in the comparison training versus practice-control conditions. Thus, the training procedure that was successful in producing one-month maintenance on the

trained task did not generalize to a different task administered immediately after training.

The issue of generalization was examined again in Experiment 3. Here the generalization task was Baldwin, McFarlane, and Garvey's (1971) picture description task. In this 10-item task, the referent in each item is a picture of an animal or person and the nonreferents are six highly similar versions of the same object. The speaker was asked to describe the referent so that a listener could pick it from the alternatives. The message could be of any length. In contrast to the snowflake task, there is a maximum of four critical features distinguishing the referent and nonreferents in each picture set, and the number of critical features varies systematically across picture items. The results for this task were quite similar to the results of the first experiment; there was a nonsignificant difference between the training condition and the practice-control condition. Thus, once again, comparison training did not generalize to a task other than the one used in training.

One possibility is that generalization did not occur because children received comparison training on just one task. To examine this issue we conducted a fourth training study, in collaboration with Peter Renshaw, the purpose of which was to determine if comparison training on more than one task would produce more generalization than comparison training on the word-pair task alone. Third- and fourth-grade children were randomly assigned to different training conditions. One group received word-pair comparison training that was identical to that of our

other studies. The other children received training on two tasks, the word-pair task and a triangle-description task. The training on the triangle task was similar to the word-pair training in that the model emphasized the importance of comparing the message to both referents and nonreferents. The posttests consisted of ten word pairs and a modified version of the Baldwin et al. (1971) picture-description task.

An examination of children's pretest and posttest data indicated that once again comparison training led to improved performance on the word pair task. Children showed an average gain of approximately 2.5 from pretest to posttest. However, the scores on the picture-description task varied only slightly across conditions. Thus, the results indicate that while comparison training was once again successful in terms of word-pair performance, training effects did not generalize to picture description.

What, then, have we learned about generalization effects of communication training? Our first and third experiments showed that comparison training on the word-pair task did not transfer to performance on other referential tasks. Our fourth experiment indicated that generalization is not obtained simply by providing comparison training on more than one task. This failure to obtain generalization in our research is similar to results from training studies conducted in other topic areas in which generalization has been a concern (Brown, 1978; Brown & Campione, 1977; Kuhn, 1974). Why is generalization of communication training so difficult to obtain? One possibility is that third- and fourth-grade children may not consciously analyze the demands of different communication

tasks. That is, they may communicate without first considering the features of the task that require attention. Analyzing task demands can be viewed as a type of meta-communicative activity (Flavell, in press; Note 3). Perhaps teaching children not only to engage in certain processes but also to recognize that a new task requires these processes would facilitate generalization. This training could be done using the "modeling plus self-guidance statement" procedure. Children could be shown a model examining a series of referential tasks. Before communicating on each task, the model could think out loud about the particular dimensions of features of the task items that require attention. Modeling this type of task-analytic activity might facilitate generalization of comparison training.

Other Task-Analytic Training Studies

When we began our comparison training research program, there were no task-analytic communication training studies reported in the literature. This situation has changed; Whitehurst and Sonnenschein (in press) report task-analytic work on teaching speaker skills. Their studies, like those reported here, support the view that attending to component skills will lead to improvement in children's communication performance.

In their chapter, Whitehurst and Sonnenschein discuss the important distinction between "novel skills" and "accustomed skills." In the first case, children lack the necessary component routines to do the task, while in the latter case, children have the routines at their disposal but have not organized them or do not appreciate when to apply them. Whitehurst

and Sonnenschein conducted a series of referential communication training experiments from which they concluded that children have comparison processing routines at their disposal but fail to use them because they do not recognize their necessity. This conclusion is consistent with earlier evidence that children seem unaware of the need to engage in comparison processing (Asher, 1976; Asher & Oden, 1976; Asher & Parke, 1975). It is also consistent with the findings of the studies we report here.

Whitehurst and Sonnenschein argue that the most important component of their training package is telling the child that he or she should describe how the referent is different from the nonreferent. A question that might be asked is whether the instruction to tell how they are different is as effective or more effective than the modeling plus self-guidance procedure used in the present research. Whitehurst and Sonnenschein present evidence of maintenance which suggests that children were internalizing the concept of describing differences rather than simply responding to an external command. On the other hand, the training did not generalize to a listener task in which children had to indicate when a message was not discriminative. These findings suggest that children were "telling how it's different" when in the speaker role without fully comprehending that it is the speaker's responsibility to provide discriminative messages. In our training studies reported here, trained children did quite well on the message-appraisal task. This suggests that children may have more fully understood the comparison concept, at least on the task used in training. Further research is necessary to clarify the conditions under which the

direct instruction to tell how it is different will be as effective as the more complicated training procedure used here.

Integrating the Role-Taking and Task-Analytic Approaches

Finally, we would like to suggest that the role-taking and task-analytic training perspectives described earlier in this chapter can become better integrated. Training studies that have emphasized role-taking training have not been successful in improving children's communication performance, largely because the role-taking construct as used in these studies has been too global. A better understanding of the components of role-taking ability and their relationship to communication accuracy should lead to training studies that improve both role-taking and communication skills.

Flavell (1974) has proposed a model that provides a more detailed conceptualization of the various component skills in role-taking. This model goes beyond the view that role-taking can be equated with simply being aware that others have different perspectives from one's own. Flavell suggests that the child initially becomes aware that people have perspectives and other psychological attributes (e.g., feelings or abilities). Second, the child begins to appreciate that an analysis of the other's perspective is important in different situations. Third, the child develops the inferential skills to make appropriate attributions about the other person's perspective. Finally, the child becomes able to translate the inferences about the other's perspective into effective behavioral

applications. These four components are referred to by Flavell as Existence, Need, Inference, and Application.

This model makes explicit the fact that in communication situations, communication failure can occur due to problems in inferences or application even if speakers are aware of the existence of other perspectives and of the need to consider those perspectives. Several studies mentioned earlier (e.g., Maratsos, 1973; Menig-Peterson, 1975; Shatz & Gelman, 1973) demonstrate that preschool children are aware of the existence of different perspectives and do appreciate the need to take the listener's perspective into account. These results imply that children's failures in communicating are not due to limited awareness that others have different perspectives, or to a lack of appreciation that these perspectives must be taken into account. Instead, children's failures may be partly attributable to problems in making accurate inferences or applications. Flavell's model of the components of role-taking could be used as a basis for developing training programs to facilitate both role-taking and communication skills. Different kinds of training could be provided depending on the particular components that children are having difficulty with.

Another way to integrate the role-taking and task-analytic traditions would be to adapt task-analytic training procedures for the purpose of teaching role-taking skill. Role-taking training studies have often employed relatively indirect or unstructured training procedures that have not greatly improved children's communication performance. In contrast, task-analytic studies have used a rather direct instruction method

of training; children are either shown or told the type of process they should engage in. As demonstrated in this chapter, these procedures have been successful in improving children's communication performance. This direct approach to instruction could be readily adapted to teaching role-taking skills. For example, children could be shown models who consider the kinds of listener characteristics that are important and take into account how those characteristics should influence their messages. This type of training procedure should be more effective than the less direct methods of instruction associated with the majority of previous role-taking training studies.

Summary

This paper described two theoretical accounts of the development of children's referential communication ability. The first approach, the role-taking perspective, explains improvement in communication accuracy in terms of the development of children's ability to take another person's perspective. This explanation appears to offer an inadequate account due in large part to the global nature of the role-taking construct and the neglect of other relevant skills. The second theoretical account, the task-analytic approach, explains the development of communication accuracy in terms of children's increasing ability to meet the specific cognitive demands of various communication tasks. A number of studies utilizing this approach indicate that engaging in comparison activity is a particularly important component of communication effectiveness.

The major portion of the paper was devoted to a discussion of studies that have attempted to train children's communication skills. Prior studies that have attempted to improve children's communication performance by training role-taking skills have not been very successful. Again, this is primarily because the relationship between role taking and communication accuracy has not been clearly specified. The studies reported in this chapter utilized the task-analytic approach. Specifically, an attempt was made to improve children's communication accuracy by teaching them to engage in comparison activity on a referential task. Three main issues were assessed: whether the training improved children's communication accuracy; whether the training effects were maintained; and whether the training effects generalized to other referential tasks.

Results indicated that comparison training was quite effective in improving children's performance and in maintaining these changes over time. However, the training effects did not generalize to other tasks. One plausible explanation is that children did not consciously analyze the demands of different tasks, and thus did not apply the comparison concept to those tasks. Future research might employ the modeling plus self-guidance statement procedure to teach children how to better analyze the demands of different communication tasks. The paper concludes with a discussion of ways to integrate the task-analytic and role-taking perspectives.

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Table 1

The Pretest and Posttest Word Pair Sets

Set A	Set B	Set C
cook - bake	plant - flower	steak - hamburger
say - tell	ship - boat	piano - violin
wash - clean	dish - plate	wrestling - boxing
music - song	mad - angry	pond - lake
city - town	hot - warm	yellow - blue
sleep - rest	river - ocean	soap - detergent
road - street	wheel - tire	motorcycle - bicycle
write - print	mitten - glove	tree - bush
short - small	rubbers - boots	slippers - shoes
sound - noise	world - earth	butter - cheese

Note: The referent word in each pair is underlined. Word pairs in each set are displayed in the randomly selected order in which they were presented to children.

Table 2

Average Posttest Communication Accuracy

in the Three Experiments

(Adjusted Scores)

Experiment	Condition	
	Practice Control	Comparison Training
Experiment 1 (Set B)	2.50	3.51
Experiment 2 (Set B)	2.09	3.54
Experiment 3 (Set C)	2.34	6.79

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