

THE EFFECT OF TRAINING IN REFERENTIAL
COMMUNICATION ON SOCIAL COMPETENCE IN
DEVELOPMENTALLY DELAYED SCHOOL CHILDREN

CENTRE FOR NEWFOUNDLAND STUDIES

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The Effect of Training in Referential Communication
on Social Competence in Developmentally Delayed
School Children

by



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of the requirements for the degree of
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ABSTRACT

This study is an investigation of the effects of training in referential communication on peer acceptance and teacher ratings of seven to nine year old developmentally delayed school children. Twenty-four subjects were divided into three groups: Treatment, attention control, and no treatment control. It was predicted that: (1) referential communication would improve with training, (2) as referential communication improved there would be an increase in the subjects' ratings of peer acceptance, and (3) improvements would occur in teacher ratings of peer interactions but not necessarily in ratings of compliance.

The results of the experiment supported the hypotheses. Children who received training in referential communication demonstrated improvement following six weekly training sessions. A two-month followup assessment showed that training was effective in producing improvements in both peer acceptance ratings and teacher ratings in the treatment group, but not in the control groups. There were no improvements in ratings of compliance. The potential benefits of referential communication as a factor in social competence are discussed, and future research needs are indicated.

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Introduction

Social incompetence is a prerequisite for the diagnosis of many childhood developmental problems (Greenspan, 1981). This diagnostic criterion reflects the importance of appropriate social skills for the everyday life adaptation of all children. Much research has been devoted to understanding the nature of social competence. As a result, some of the causes and consequences of inappropriate social behaviour have been determined and will be reviewed later. However, there remain a number of critical skills which, though reportedly correlated with social competence, have not been studied in terms of direct relationships.

One such skill, called referential communication, involves the ability to accurately describe what you are talking about so that another person understands. The limited number of studies available have shown referential communication to be related to a child's level of social competence. Researchers have found that developmentally delayed children (those who lag behind their same-age peers in physical and/or cognitive development) experience problems with referential communication (eg. Watson, 1978). A possible influence on the problems of social competence for developmentally delayed children may be their difficulty with accurate communication. One method

of determining whether this is so is to provide an intervention programme in referential communication, and look for resulting improvements in social acceptance, an important component of social competence.

Referential Communication

The ability to convey information in a clear and concise manner is an important aspect of communication, and is often called referential communication. Referential communication refers to verbal communication aimed at helping a listener discriminate the target of a communication (the referent) from competing nonreferents. For reference to be successful, attention must be paid by the speaker to the context of a target in relation to other alternatives (Watson, 1977). If a single large red circle is in view, then the appropriate pointing gesture, or the word 'that' will be sufficient to refer to it. However, if the same circle lies within a context of other similar items, then reference to it must take account of their properties, as in 'the biggest red circle'. By the age of eight or nine years, children have usually developed near adult-level competence on referential communication tasks (Glucksberg, Krauss, & Higgins, 1975).

There has been a substantial amount of research

concerning the development of referential communication skills in young children in the past decade. As a result, two sets of subskills necessary for successful communication have been identified: speaker skills and listener skills.

Speaker skills. The successful speaker in a referential communication task is proficient in the use of certain component subskills. The first of these is the ability to assess listener characteristics and informational needs, a skill referred to as perspective evaluation. Roberts and Patterson (1983) found that children classified as low in perspective evaluation performed consistently worse on a referential communication task than did children who scored high on perspective evaluation. The ability to accurately assess the listener's informational needs was a strong predictor of these children's communicative performances. Correlations between scores for the perspective evaluation task and the number of contrastive messages produced (i.e., those specifying a dimension on which the target referent differs from the others) were positive and significant, $r = .44$ and $.49$ respectively.

While the speaker may realize the listener's informational needs, it remains that an adequate message be constructed. To do so, a comparison component must be

utilized. The speaker is required to analyze several stimuli to determine which attributes of a referent distinguish it from nonreferents. If a child is unable to isolate a referent's distinguishing characteristic(s), he or she will be unable to evaluate the quality of the message. This arises from the presumption that evaluation occurs by comparing stimuli to determine if the message actually describes a differentiating attribute. Whitehurst and Sonnenschein (1981) addressed the issue of comparison skills on two levels: do children know how to make stimulus comparisons, and if so, do they know when to use this skill? Experimental results showed that while children between four and five years of age were able to specify differences when asked, they did not make comparisons in a referential communication task. In other words, they did not know that to communicate referentially they must make comparisons and describe differences.

A final component skill involves the ability to detect ambiguities in one's own messages before they are spoken. An important prerequisite skill is "metacommunication ability" (Flaell, 1977, p.178). In other words, a speaker must analyze, evaluate, and edit prospective messages for accuracy. In a series of experiments, Robinson (1981a) demonstrated that children who fail to detect ambiguities in their messages blame the listener for communication failure. These children also have problems improving their

inadequate messages if asked for more information.

In summary, success on a referential communication task requires that the speaker realize the informational needs of the listener. In order to convey the necessary information, referents must be compared for distinguishing qualities, and resulting messages analyzed for accuracy.

Listener skills. The importance of the speaker role in referential communication has been extensively investigated. However, the contribution of the listener was initially considered minor, in that deficits in listener skills did not affect successful communication following an ambiguous message (Glucksberg, Krauss and Weisberg, 1966). In contrast, researchers have recently shown that when children are presented with inadequate messages, the absence or presence of certain listener skills can affect communicative success.

One influential skill is a child's ability to recognize when a message is ambiguous or uninformative (Patterson & Kister, 1981). The decision to select a potential referent based on message adequacy must therefore incorporate a comparison component. That is, the listener has to compare the information provided by the speaker with the qualities of the target set of referents. The available evidence suggests that older children are

generally more successful at recognizing message ambiguity than are younger children (Bearison & Levy, 1977).

A second listener skill concerns the knowledge that the quality of the speaker's message can influence communication accuracy. Such knowledge (or lack of knowledge) can affect the listener's performance in any of several ways. Upon judging a message as inadequate, a listener who does not understand that inadequate messages can lead to communication failure might not blame the speaker for the failure. The same listener may refrain from requesting more information and guess at the correct answer. This response indicates that the listener neglected the comparison of relevant referent attributes to judge message quality (Robinson & Robinson, 1978).

A third skill important to the listener role is the ability to inform the speaker that his/her message is adequate. A listener who is effective in discriminating adequate from inadequate messages, and who can understand the role of the message in communicative success, he or she should provide a response to an adequate message. Although a verbal response is not always necessary in a referential communication setting, a confirmation from the listener can maximize the efficiency of the communication.

A fourth listener skill involves the provision of a

verbal response to ambiguous messages. It is important that the listener recognize the message as inadequate, indicate the fact to the speaker, and possibly specify the missing information. This skill appears to follow developmental trends, with younger children (preschool to grade four) less likely to provide feedback than older children (Cosgrove & Patterson, 1977, Glucksberg et. al., 1975).

In summary, recent studies indicate that deficiencies in young children's performance in the listener role are a major cause of communication failure. Four skills important in the listener role have been identified: assessment of message quality; knowledge that message quality affects communicative success; ability to respond effectively to adequate messages (eg. confirmations), and ability to respond effectively to inadequate messages (eg. questions).

Conclusion. The roles of both the speaker and the listener in the success of referential communication tasks has been established through extensive research. The success of communication depends upon the acquisition of several skills by both speaker and listener, and the ability to apply the skills in a referential communication setting. While the speaker and listener play unique roles in communicative success, they have in common one important

skill - the ability to make comparisons between referents. The speaker must make comparisons to construct a message, while the listener must use the comparison skill to judge whether or not the message is adequate. Since both roles are important for successful communication, any programme aimed at improving referential communication in children must emphasize the interaction between listener and speaker.

Training Children's Referential Communication Skills

A number of experimental training programmes have been aimed at enhancing children's speaker and listener skills in referential communication tasks. The majority of the training techniques were developed within the framework of developmental studies examining the nature of children's referential communication skills.

Training speaker skills. Whitehurst and Sonnenschein (1978) developed a task that has been used to improve comparison skills for the purpose of communication. Children were presented with a sequence of thirty pairs of triangles, with each pair differing on one of three dimensions: size, colour, and pattern. The target referent in each pair was marked with a star above it. Whitehurst and Sonnenschein (1981) demonstrated in a later

study that the most effective combination of instructions and feedback were "Tell me about the triangle with the star above it so that I will know which triangle you are talking about," followed by "That's good (wrong); you told (did not tell) me how the triangle with the star above it was different from the other."

To enhance the ability to detect listener needs, Robinson (1981a) developed a series of "whose fault" questions to be used in a referential communication task. Following communication failure, the child is asked "We went wrong that time. Whose fault was that, mine or yours? Why? Did I/you tell you/me properly which one to pick? If the child says no: What should I/you have said? Whose fault was it we went wrong? Why?" This series of questions allows the experimenter to determine which role, speaker or listener, the child blames for communication failure. As part of a training task, feedback may be provided in the form of confirmations from the listener concerning the accuracy of the communication.

Robinson (1981a) designed a procedure which was successfully used to help children detect ambiguities in their own messages. The children and the experimenter played a game that involved selecting clothes for a doll to wear, the goal being for the child to describe an item so that the experimenter could select a matching one for her

doll. When the children gave an inadequate description, the experimenter either made a guess, asked, "Which one?" in a puzzled tone of voice, or made explicit what was missing in the message. Each child was tested prior to and following this game for his or her understanding of inadequate messages and their role in communication failure. The test was a similar matching game. Following each unsuccessful communication by either participant, the experimenter asked the child a whose-fault sequence of questions. The sequence determined which role, speaker or listener, was felt to be the cause of communication failure, and the reasons for the decision. The children at the start of the experiment had no knowledge about the role of inadequate messages in communication failure. Children who were given explicit feedback about their inadequate messages benefitted in two ways compared to the children in the other two feedback conditions: They gave better messages spontaneously, and were more likely to have improved their knowledge about communicating by the end of the experiment. In addition, Robinson showed that children who understood the role of inadequate messages ascribed blame for communication failure to the speaker, and could identify at least one component missing from each inadequate message. In summary, Robinson states "The problem for the child in coming to understand about communication... may be that adults are quite unaware of the child's needs to be informed explicitly about the

success or failure of communications" (p. 186).

Training listener skills. Relatively few studies have focused on facilitating the performances of young listeners in referential communication tasks. The majority of the reported studies have been concerned with the listener's response to the inadequate message, and the effect of the response on the speaker's performance.

One study that attempted to improve children's performance as listeners was reported by Cosgrove and Patterson (1977). A plan was provided that emphasized the importance of asking for more information if the speaker's message was inadequate. The plan enabled children in grades kindergarten, two, and four to ask more useful questions, obtain more information from the speaker, and make more correct referent choices than those in a no-plan control group. Similarly, Patterson and Massad (1980) showed that the provision of listener feedback taught speakers to produce more adequate messages over trials.

The effect of modelling as a technique for training listeners was examined in a second study by Cosgrove and Patterson (1978). The hypothesis that instructions and modelling together might be more effective than either individually was also explored. An immediate and a delayed test (two to three day interval) were used to assess

training effects on first graders' listener performances. Results showed that training by either instruction or modelling facilitated listener performance with both familiar and unfamiliar stimuli. The effects were maintained on the delayed test. However, combining instructions and modelling proved no more effective than either method alone.

Generalization of training. Although the same skills (eg. comparison of referents) may play a role in both speaking and listening, research has shown that skills trained in one mode do not generalize to the other (Whitehurst & Sonnenschein, 1981). Sonnenschein and Whitehurst (1983) suggested that "deficiencies may not be due to speaking tasks requiring different skills, but to the child being unaware (or failing to act on the awareness) of functional similarities between certain listening and speaking skills" (p. 434).

In further developing their premise, Sonnenschein and Whitehurst (1984a) suggested that a hierarchy of referential communication skills exists. They argued that since past researchers have failed to obtain transfer from speaking and listening tasks to criticism tasks (Sonnenschein & Whitehurst, 1984b; Flavell, Speer, Green & August, 1981), criticism of others' performances must involve a more abstract level of skill. Criticism skills

therefore, are at the top of the skill hierarchy, and training them should result in the transfer of skills to the speaker and listener modes. In an experiment, children were asked to observe two dolls, a listener and a speaker, participate in a referential communication task. The children were asked to criticize the dolls' performances as listener and speaker, and to offer suggestions as to how communication might be improved. Half of the children were given feedback concerning their judgements. Results of the intervention indicated that transfer did occur, but the degree of transfer varied with the training task. For example, children who were told that communication would be improved by comparing referent qualities only when speakers made errors learned to apply the skill only in the speaker role. Children who received the same feedback following both listener and speaker errors could apply the information to improve their performances in both roles. The results indicate that evaluation of another's performance on a referential communication task is superordinate to speaker, listener, and self-criticism skills. While children may not naturally acquire referential communication skills only by criticizing others' performances, the procedure suggested by Sonnenschein and Whitehurst (1984) is promising as a training technique.

Summary. To communicate referentially is to speak

so that others will understand, and to listen so that you will understand others, or know when you have not. Accurate communication is important not only in structured tasks, but also in everyday conversation. Whether a child is referring to toys, events, or other people, it is necessary to convey adequate information to his/her listener. To contribute to the success of the communication, the listener should ask questions or provide confirmations when appropriate.

Providing feedback also serves the purpose of extending social interaction between the speaker and listener. In this sense, accurate communication is a vital skill for establishing and maintaining social contact. Children who are effective at expressing their thoughts and feelings are likely to be more talkative, and thus elicit responses from their peers. On the other hand, children with poorly developed communication skills may be reluctant to interact with their peers, particularly if they cannot sustain conversation. Consequently, they may be ignored by peers and react by exhibiting withdrawal or acting out behaviour. Such behaviour may further isolate the poor communicators from their peers.

Similar difficulties can occur in developmentally delayed school children, whose peer acceptance is compounded by their special developmental problems.

Although integration programmes have been developed in an effort to facilitate acceptance of delayed children in the regular classroom, these programmes have not been entirely successful (Maddux & Maddux, 1983). Therefore, it becomes necessary to turn to other sources to assist in understanding the problem of peer rejection.

Social Competence in Delayed Children

The study of social competence in developmentally delayed children has widespread implications, not only during childhood, but also for the adolescent and adult years. It has often been argued that social competence, rather than IQ, should be a criterion used to classify someone as mentally retarded. For example, Zigler and Cascione (1977) and Zigler and Valentine (1979) suggested that a reasonable and effective method of evaluating early intervention programmes is the measurement of social competence in addition to IQ. Furthermore, Greenspan (1981) points out "that it is an individual's level of social competence which determines whether he or she will be viewed as handicapped in adult life." These convictions are in accordance with diagnostic systems (Grossman, 1973; Heber, 1961) which advocate the use of criteria involving deficits not only in intelligence, but also in adaptive behaviour.

While it is largely agreed that developmentally delayed children suffer limitations in their ability to establish and maintain satisfactory interpersonal relationships, surprisingly little research has been afforded this topic. However, educators have become increasingly convinced of the importance of children's peer relationships as a factor in social competence, particularly in the case of mainstreamed handicapped children (Maddux & Maddux, 1983). A considerable amount of recent research suggests that many developmentally delayed children tend to be more socially rejected in regular classrooms than in segregated classrooms (Johnson & Johnson, 1980; Semmel, Gottlieb & Robinson, 1979). Such evidence disputes the beliefs that integrated placement alleviates the stigma associated with special classes (Dunn, 1968) and that normal pupils' acceptance of delayed children improves as a result of increased contact and familiarity (Fischer & Risso, 1974).

Communicative Accuracy and Social Competence

While the number of studies is limited, there is evidence that normal children's ability to communicate accurately is related to the quality of their peer relationships. Rubin (1972) found that the performance of kindergarten and second grade children on a referential

communication task was significantly related to peer popularity ratings. Gottman, Gonso, & Rasmussen (1975), with the use of a sociometric measure, established that the third and fourth graders who communicated more accurately on a referential communication task also had more friends. A sociometric measure is one which establishes functional relationships among group members.

With the use of teacher rating scales, Greenspan, Monson & Simeonsson (1979) studied the social competence ratings of 32 delayed (mean IQ = 56.4) children in relation to levels of referential communication skills. Using the Kohn Social Competence Scale (Kohn & Rosman, 1972) and the Predicted Behaviour Scale, it was found that teacher judgements of social competence were significantly related to the skills of role-taking and referential communication. A specific area studied was interpersonal functioning in the classroom, which includes the dimensions of conformity to rules or acceptable behaviour, "interest, curiosity, assertiveness," and quality of peer interaction.

Communication is important for all children, as it is a factor in the development of social interaction skills (Asher, 1978). It follows that the study of communication deficits and their role in the establishment of interpersonal relationships provides a framework for examining problems of acceptance in developmentally delayed

school children.

Measures of Social Competence

A number of researchers have focused on the development of reliable and valid measures of social competence in children. Among the majority of these measures are those designed to obtain judgements from either peers or teachers.

Ratings by peers. A strategy commonly used to assess children's social acceptance is to obtain ratings from significant others, such as peers. Peer ratings have been classified as either peer assessment or sociometric strategies (Kane & Lawlor, 1978). Peer assessment strategies require raters to assess certain peer characteristics. Although this technique has been used successfully to differentiate socially skilled and unskilled responses in adult and adolescent interaction (Twentyman & McFall, 1975; Kupke, Hobbs & Cheney, 1979), most studies have relied on sociometric ratings to identify individuals with social-skills deficits. Because of their limited use with children, general reliability and validity characteristics of peer assessment strategies have not been adequately evaluated (Foster & Ritchey, 1979). Sociometric data are usually obtained through the administration of

questionnaires that ask children to nominate those peers they especially like or dislike, or to rate their peers along some social dimension such as how much they would like to play with that person (Asher & Hymel, 1981).

One common sociometric strategy is a peer rating scale, also called the Social Distance Scale, developed by Bogardus (1933). With this scale, children are required to rate each of their peers on a five-point, Likert-type scale. Using eight and nine year old children, Oden and Asher (1977) reported test-retest reliabilities of 0.82 and 0.84 for play and work preferences respectively. A simplified version (a three-point scale anchored by smiling, neutral, and frowning faces) has been developed for use with preschoolers (Asher, Oden & Gottman, 1977).

The rating-scale sociometric technique allows every child to be rated by each of his or her peers. Therefore, the child's status with each group member can be assessed, making possible more fine-grained analyses of the data. With the use of the rating-scale technique, children's ratings are unaffected by group size (Foster & Ritchey, 1979).

The research concerned with peer sociometric procedures is consistent in showing strong psychometric properties (Hartup, 1983). Milich and Landau (1982)

demonstrated concurrent and predictive validity in the use of sociometric instruments. In a recent study, Landau, Milich and Whitten (1984) found a significant agreement between teacher judgements of popularity and peer ratings of popularity and rejection, $r = .50$ and $-.59$, respectively.

Although many sociometric measures have demonstrated adequate psychometric properties, their utility is restricted in that they serve a limited evaluative function. That is, when used as test-retest measures, they may indicate only that others' perceptions have changed, and fail to provide indications of the specific factors that contributed to that change (Michelson, Foster & Ritchey, 1981). Therefore, it is important to use them accompanied by measures which assess specific behaviours more directly, such as teacher rating scales.

The majority of studies utilizing sociometric questionnaires have involved familiar peer groups such as classmates. While convenient, assessing children's behaviour within established peer groups may make it impossible to form inferences about the direction of causality (Asher, 1983). In other words, one cannot determine whether behavioural differences between high- and low- status children are the causes or consequences of status.

Three recent studies (Cole & Kupersmidt, 1983; Dodge, 1983; and Putallaz, 1983) examined peer status as assessed in groups of unfamiliar peers. Cole and Kupersmidt (1983) examined the emergence and maintenance of social status in groups of familiar and unfamiliar boys over six sessions. Observational techniques were used to obtain weekly measures of each boy's social status. This study provided support for the use of unfamiliar peers in assessment of social status, as the judgements were useful in determining the effect of specific behaviours on peer acceptance. A second study by Dodge (1983) also utilized unfamiliar peers for assessment purposes. Previously unacquainted second-grade boys were brought together in groups of six for eight one-hour sessions. Free-play interactions of each child were recorded by observers during each session, and a sociometric interview was conducted with each boy following the last session. The results allowed the experimenter to identify five distinct status groups based on the social approach patterns of the subjects. Finally, Putallaz (1983) videotaped preschool boys as they attempted to interact with a pair of unfamiliar boys. The two boys were experimental confederates who engaged in several games and presented a number of specific problematic social situations to the subjects. The entry behaviour of the subjects was used to predict their sociometric status four months following their starting first grade. Even after controlling for intelligence, the subjects' ability to

enter the group by offering appropriate conversation was related to their future social status. Two important factors in the study of social competence arose as a result of this research. First, a child's peer group status is often determined by initial approach and entry behaviour patterns. Second, behaviour in unfamiliar settings can be used to predict future behaviour within a group.

Teacher rating scales. Along with an increased interest in early identification of children's social competence has come an increased reliance on teacher judgements to identify children with social skill deficits (Michelson, Foster & Ritchey, 1981). The validity of such scales in the assessment of children's social competence has been repeatedly criticized. Teacher judgements have been shown to be affected by variables such as sex of child, sex of teacher, age and grade level of the child, and socioeconomic status of the child (Michelson et al., 1981). These findings do not necessarily invalidate teachers' ratings of children's social skills. They do, however, point out that situation specificity and interactor variables influence ratings of social competence. The various scales are helpful in the evaluation of childhood problems (Greenspan, 1981), in identifying dimensions or response clusters of child behaviour (Loranger, Lacroix, & Kaley, 1982) and in serving as general outcome measures of intervention effectiveness.

(Ollendick & Cerny, 1981).

Kohn Social Competence Scale. The Kohn Social Competence Scale is a teacher rating scale designed for use with preschool children. It consists of 73 items rated on a Likert-type scale, and yields two factor scores. Factor I is labelled Interest-Participation versus Apathy-Withdrawal, and is concerned with the child's use of opportunities available in the classroom setting. The positive items reflect curiosity, outgoingness, and friendliness. The negative items indicate lack of interest in the surroundings, shyness, and absence of interpersonal associations. Factor II deals with compliance to rules and regulations of the classroom. The positive items show willingness to conform; the negative items indicate noncompliance to the teacher and antagonism towards peers.

The validity and reliability of the Kohn Social Competence Scale have been demonstrated in numerous ways. The interrater reliability correlations between pairs of teachers were found to be .77 and .80 for Factors I and II respectively (Kohn, 1977). Satisfactory levels of test-retest reliability have been provided by Kohn and Rosman (1972a) and Connolly and Doyle (1981). Information supporting the construct validity of the measure has also been presented: factor analyses of data collected from teachers have confirmed the two-factor structure of the

measure (Kohn & Rosman, 1972a; 1973c); scores from the measure have been shown to discriminate between clinical groupings of subjects (Kohn & Rosman, 1973c); and the factor scores have been shown to significantly relate to alternative teacher-judgement measures (Kohn & Rosman, 1972b). The criterion related validity of the measure has also been well established. Thus, Factor I and Factor II are related to indices of academic achievement (Feshbach, Adelman, & Fuller, 1977; Kohn & Rosman, 1973a, 1974; Perry, Guidubaldi, & Kehle, 1979), to observations of behaviour in test situations (Kohn & Rosman, 1973b); and to scores from sociometric measures (Connolly & Doyle, 1981). Studies have also supported the use of the Scale with school-age children (Kohn, 1977; Foster & Ritchey, 1980).

In summary, a variety of assessment scales have been developed for the purpose of obtaining peer and teacher judgements of children's social competence. While the validity of some of these scales has been questioned, nonetheless they continue to provide valuable information about the nature of children's social interactions.

The Present Study

The evidence indicates that children's referential communication skills are related to their level of peer acceptance. Also, there exists support for the use of both peer and teacher rating scales in determining a child's social status. It seems reasonable to proceed on the assumption that children experiencing difficulties with social skills require intervention. Thus, it may be worthwhile to apply and extend the findings reviewed by examining a referential communication training programme for its effectiveness in improving social competence.

The objective of the present study is to further investigate the relationship between referential communication skills and social competence in developmentally delayed school children. Whereas the majority of reported studies of referential communication, and indeed, of problems in social acceptance, have used normal populations, the present investigation involves children with developmental delays. It is predicted that referential communication skills will improve with training. It is also predicted that the improvements in referential communication skills will result in improved peer ratings of social competence, and in greater teacher ratings of social competence in the classroom. Since it is anticipated that the training will be specific to peer and

teacher ratings of interaction, no change is predicted on Factor II of the Kohn Social Competence Scale. This factor measures compliance in the classroom.

Social competence will be measured in two ways: a peer rating scale and a teacher rating scale. Research has shown that the use of unfamiliar peers is an effective method of evaluating peer status (Cofe et. al, 1983; Dodge, 1983; and Putallaz, 1983). This technique is felt to be particularly important in the assessment of developmentally delayed children, as it avoids the possible influence of predeveloped attitudes of familiar - classroom peers. Delayed children who receive special, remedial attention in the classroom are often rejected by their normal peers, who become more aware of the differences in academic abilities (Johnson et. al, 1980). In contrast, unfamiliar peers may have less knowledge of any particular problems experienced by their developmentally delayed peers.

The Kohn Social Competence Scale was selected primarily because it includes both positive and negative aspects of social competence. Therefore, any changes in classroom behaviour which may be accompanied by changes in social status could be discerned.

MethodSubjects

Twenty-four school children between the ages of seven and nine years participated in the experiment. These children were selected from populations seen at both the Direct Home Services Program in St. John's and the Diagnostic and Remedial Unit of Memorial University. They were initially referred with developmental, academic, and/or communication problems. The subjects were selected based on these initial referral problems, then tested to meet the following inclusion criteria:

(1) a score at least one standard deviation below the mean on the Alpern Boll Developmental Scale.

(2) a score of less than 15 points on the Communicating All Necessary Steps Task, a test of referential communication ability.

(3) a score at least one standard deviation below the mean on the Social Distance Scale.

(4) a score at least one standard deviation below the mean on the Kohn Social Competence Scale.

Upon selection, the subjects were assigned according

to age and sex to three groups: Experimental, Attention Control, and No Treatment Control. Each group was comprised of eight children: two seven-year-old boys, one seven-year-old girl, two eight-year-old boys, one eight-year-old girl, one nine-year-old boy, and one nine-year-old girl.

Procedure

Social Competence Measures. The Social Distance Scale was used to obtain ratings of peer acceptance. Previously unacquainted children were brought together in newly constructed play groups for a one-hour session. For this purpose, non-target children were employed. A search of the files from the Diagnostic and Remedial Unit was used to recruit the children, whose parents were contacted to request permission. Seven groups, each consisting of ten, same-sex, seven-to-nine-year-old children were involved. Three of the seven groups were composed of girls, and each group consisted of three target and and seven non-target children.

The remaining four groups, composed of boys, were arranged such that three groups included four target and six non-target children, while the fourth included three target and seven non-target children. The composition of the groups remained the same across assessment periods,

with the exception that the target and non-target children were varied for each group to ensure that previous acquaintance had no effect on ratings. As in the Dodge (1983) study, the first 20 minutes of the play session was structured by the experimenter. Various play materials were provided and the children were directed in making paper hats, which they could then decorate. During the last 40 minutes, children were allowed to play freely in a large room stocked with furniture and play materials. Following the one hour play period, both target and non-target children remained in the group, and each was given a paper and pencil rating scale. They were asked to rate every other child on a five-point, Likert-type scale according to the question "How much would you like to play with (name of child)?" Each of the five scale points was described with the use of an example.

The Kohn Social Competence Scale was distributed through the mail to teachers, who were blind at all time periods to the treatment group to which the children were assigned. They were asked to rate and return it as soon as possible.

Referential communication measure. The
Communicating All Necessary Steps Task (Greenspan et al., 1979) is a test of referential communication. Eight cans vary along three dimensions: size (large, small), colour

(red, white) and placement (above table, below table).. The children were seen individually and shown the arrangement of the task. To test their knowledge of the colour and size characteristics used, each was asked "Point to a white one. Point to a big one. Point to a red one. Point to a small one." The following instructions were then presented: "I'm going to show you some toys, one at a time. Then I'll turn around so I can't see you, and when I'm not looking, you hide the toy under one of the cans. Tell me when you're ready." When the child indicated that he or she was ready, the experimenter turned around and said: "Tell me where you hid the toy." The task was completed when five objects had been hidden. Each response was scored according to accuracy, with one point allotted for each correct attribute described (eg. big, red, on the table) to a maximum of 15 points.

Developmental measure. The Alpern Boli Developmental Scale consists of milestones of development in five areas of functioning: self - help, social, motor, academic, and cognitive. Each area is rated according to age in months, and is based on an interview with the child's primary caretaker. The scale spans an age range from birth to twelve years, and each child is given a developmental level based on chronological age. This scale was administered only prior to treatment.

Upon receipt of parental consent, children and parents were invited to come to the Psychology Department Clinic at Memorial University, where the Alpern-Boll Developmental Scale and the Communicating All Necessary Steps Task were administered. If inclusion criteria were met on both measures, the subjects' teachers were asked to complete the Kohn Social Competence Scale. A second visit was arranged for each child, during which the Social Distance Scale was administered.

Subjects in the experimental group received six weeks of training in referential communication (Appendix A), while subjects in the Attention Control group participated in various activities for six weeks (Appendix B). The relative amounts of time spent in individual and group activities were equal for both groups. The no treatment control group received no training.

Following the six weeks of training and at a two month followup session, each subject was again administered the Communicating All Necessary Steps Task, the Kohn Social Competence Scale, and the Social Distance Scale. At all assessment periods, the tests were number coded by an assistant for purposes of scoring. This procedure was carried out to eliminate experimenter bias.

Results

Pretreatment Measures

Preliminary analyses were carried out to determine any gender effects on pretreatment measures, and to establish equivalence of the groups with respect to developmental level. Gender effects were evaluated by collapsing across treatment groups to yield larger sample sizes. T-tests revealed no significant pretreatment differences with respect to sex on the Communicating All Necessary Steps Task (CANST), the Social Distance Scale (SDS), or the Kohn Social Competence Scale (KSCS). These test results are summarized in Appendix C. A multivariate analysis of variance on the subjects' Alpern Boll scores showed no significant difference between the treatment, attention control, and no treatment control groups in their degree of developmental delay, $F(10, 105) = 1.08, p > .05$. The means and standard deviations for the three groups are presented in Table 1.

Posttreatment and Followup Analyses

The means and standard deviations for the Communicating All Necessary Steps Task, the Kohn Social Competence Scale, and the Social Distance Scale are presented in Table 2. Scores on all measures were converted to z-scores in order to permit comparisons across

measures. For this purpose, each factor of the Kohn Social Competence Scale was treated as a separate measure. The converted scores were analyzed by a $3 \times 3 \times 4$ analysis of variance with repeated measures (Table 3). The analysis revealed significant Group, Time and Measures main effects ($p < .05$, $.01$, and $.05$, respectively), as well as significant Group \times Time, Measures \times Time, and Group \times Measures \times Time interactions ($p < .01$, $.05$ and $.0001$, respectively).

Given the significant Group \times Time interaction, it was necessary to determine its source. The group means based on the raw scores of all measures were plotted for each assessment period (Figures 1 through 4), and a 2 (groups) \times 3 (time) analysis of variance was carried out on each measure (Table 4). The analyses revealed significant Group ($p < .01$), Time ($p < .01$) and Group \times Time ($p < .01$) effects for all measures except Factor II of the Kohn Social Competence Scale. Multiple comparisons using the Scheffe method were carried out on the group means at each time period for the measures on which significant effects were obtained in the analyses of variance. At pretreatment, no significant differences were found between the three groups on any of these measures. At posttreatment, the treatment group mean was found to be significantly greater ($p < .001$) than both control group means on the Communicating All Necessary Steps measure of

referential communication. Figure 1 shows that this difference is attributable to improvements in the treatment group mean, with no change in either control group mean over this time. No significant differences were found between the groups at posttreatment on any other measure. Posttreatment results therefore show that the training program was effective in improving referential communication but that the effects did not immediately generalize to other measures of social skill. At followup, the treatment group means were found to be significantly greater than both control group means for measures of referential communication ability ($p < .001$), peer acceptance, as assessed with the Social Distance Scale ($p < .001$), and teacher judgements of interest and participation, which were measured with Factor I of the Kohn Social Competence Scale ($p < .001$). Figures 1, 2, and 3 show that these differences are attributable to gains in the treatment group means on these measures. Thus the initial improvement in referential communication skill maintained and was followed by gains on other measures of social skills.

No significant differences were found between the control group means on any measure at any time indicating that non-specific factors were not responsible for the improvements found in the treatment group.

Table 1

Means and standard deviations of Alpern Bell
scores for the three experimental groups

	<u>Group</u>					
	<u>Treatment</u>		<u>Attention Control</u>		<u>No Treatment</u>	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Physical	23.87	2.99	21.50	7.82	20.62	4.30
Self Help	26.50	2.72	25.50	3.46	27.75	3.15
Social	26.50	4.14	23.25	4.09	24.25	3.15
Academic	17.75	3.24	17.75	3.41	18.25	4.16
Communication	27.25	5.20	26.00	7.73	22.25	4.02

Note. The mean values refer to age in months.

Table 2

Means and standard deviations for experimental groups on dependent measures at pretreatment (Pre), posttreatment (Post) and followup (Fol)

	Time					
	Pre		Post		Fol	
	M	SD	M	SD	M	SD
CANST						
Treatment	5.8	3.1	13.8	2.1	14.6	1.1
Attention	4.7	3.7	6.1	3.5	5.7	3.0
No Treatment	4.5	3.4	6.1	3.4	5.7	3.8
SDS						
Treatment	12.5	2.5	13.3	2.2	27.5	4.0
Attention	11.5	2.0	11.6	2.8	11.9	3.6
No Treatment	10.8	1.1	11.6	1.9	11.0	2.6
KSCS (FI)						
Treatment	-16.7	17.9	-61.7	18.4	-7.5	27.9
Attention	-85.2	32.3	-83.5	33.2	-71.0	44.8
No Treatment	-80.5	22.8	-78.7	24.0	-81.7	24.8
KSCS (FII)						
Treatment	142.5	73	149.7	73.8	175.7	95.3
Attention	125.4	34.7	123.5	33.8	140.2	32.5
No Treatment	157	37.7	156.5	35.6	145.7	46.8

Note. N = 8 subjects in each group

Table 3

Summary of analysis of variance on the Communicative All
Necessary Steps Task, the Social Distance Scale, and the
Kohn Social Competence Scale

Source	SS	DF	MS	F
Group (G)	11.40	2	5.70	4.21 *
Error	28.45	21	1.35	
Time (T)	4.79	2	2.39	21.03 **
G x T	10.99	4	2.74	24.13 **
Error	4.78	42	.12	
Measure (M)	223.55	3	74.51	55.81 **
G x M	7.12	6	1.18	.88
Error	84.12	63	1.33	
M x T	2.06	6	.34	2.69 *
G x M x T	7.43	12	.62	4.85 ***
Error	16.06	126	.12	

* $p < .05$ ** $p < .01$

Table 4Summary of analyses of variance on
measures over time

Measure	SS	DF	MS	F
CANST				
Group	7.23	2	3.61	19.0 *
Time	4.20	2	2.10	11.05 *
Group x Time	10.87	4	2.72	14.31 *
Error	12.29	63	.19	
SPS				
Group	9.26	2	4.63	51.44 *
Time	3.10	2	1.55	17.22 *
Group x Time	12.87	4	3.22	35.78 *
Error	5.75	63	.09	
KSCS (PI)				
Group	6.10	2	3.05	12.70 *
Time	2.90	2	1.45	6.04 *
Group x Time	3.67	4	.92	3.83 **
Error	15.40	63	.24	
KSCS (PII)				
Group	3.13	2	1.56	1.92
Time	.86	2	.43	.53
Group x Time	1.53	4	.38	.47
Error	50.95	63	.81	

* $p < .01$ ** $p < .05$

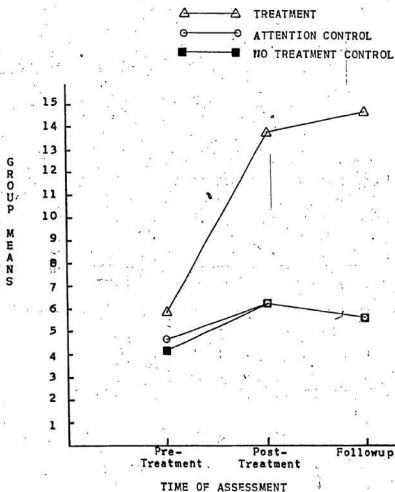


FIGURE 1 : Group Means over Time on the Communicating All Necessary Steps Task

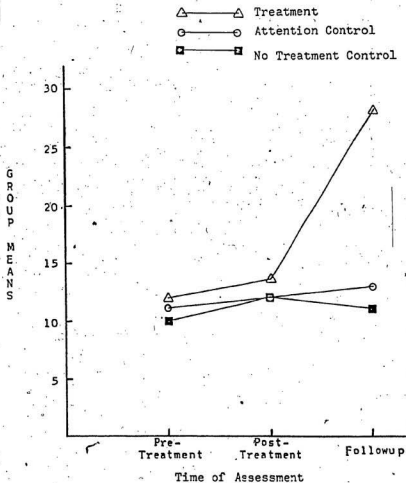


Figure 2: Group means over Time on the Social Distance Scale

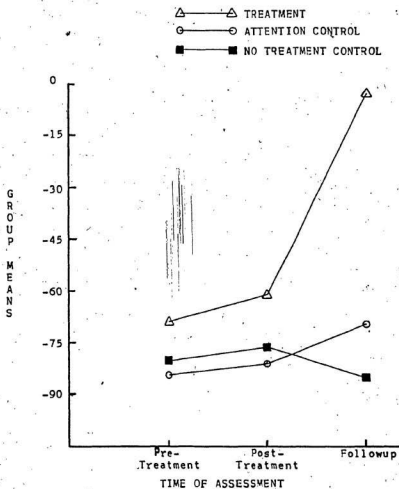


FIGURE 3: Group Means over Time on the Kohn Social Competence Scale (Factor 1)

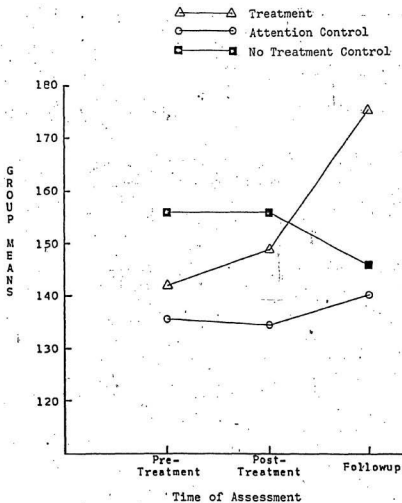


Figure 4 : Group means over Time on the Kohn Social Competence Scale (Factor II)

Discussion

The data suggest that training in referential communication facilitates peer acceptance and teacher ratings of peer acceptance in developmentally delayed school children. The results are encouraging for those who are involved in developing intervention programmes for socially incompetent developmentally delayed children.

Prior to treatment, all subjects experienced various deficiencies in relation to peer acceptance and classroom behaviour. They were judged unacceptable as playmates by same-sex peers, and by classroom teachers as disinterested and disobedient. In addition, all were poor referential communicators. Following six weekly sessions of communication training, notable improvements were evident in the referential communication skills in the training group. Control group children demonstrated minimal change. At this time, none of the measures of social competence showed any differences from pretreatment assessment for any group. At the two-month followup, the hypothesis that improvements in referential communication would result in greater peer acceptance was confirmed by the data, as differences between the treatment and control groups were evident. The changes in peer ratings indicate that the skills taught in the treatment sessions were maintained, and subsequently generalized to play situations. The

results also support the use of peer rating scales in assessment, as they imply that children are sensitive to positive changes in their peers' behaviour, and respond to them accordingly.

Significant differences between the groups on the Kohn Social Competence Scale (Factor I) were also evident at the two-month followup. Factor I reflects interest and participation in classroom activities. Children in the treatment group demonstrated specific behavioural changes in the classroom. For example, teachers noted increases in their prosocial behaviour, such as cooperation, sharing ideas, and eagerness to try new things. Decreases occurred in such behaviours as withdrawal from other children, unwillingness of others to play with them, and disinterest in classroom activities. As predicted, the second factor of the Kohn Social Competence Scale, which reflects conformity to established classroom rules, was not influenced by training. One would expect that children who find that they can initiate more positive interactions would become more interested in peer-related classroom activities. However, readily following the instructions of one's teacher may not require specific communicative ability on the child's part, and therefore would not be affected by improvements in such skills. Moreover, reinforcement contingencies for obedience would not have changed. Consequently, training in referential

communication does not, over a three-month period, generalize to skills that are not directly related to communicative ability. One might suspect that as interactions are maintained and friendships are formed, the children may be influenced to a greater degree by their peers' prosocial behaviours. For example, if disobedience becomes unacceptable to these new, desired friends, then a decrease in such behaviour might result. Longer term followup is required to investigate this hypothesis. The present study indicates that training in referential communication benefits children who experience social competence deficits related to their communication skills. Such training is not an effective procedure to implement when one is concerned with other types of social skills, such as classroom obedience. Such behaviours are affected by factors other than the ability to express oneself adequately, and therefore must be approached through alternate methods.

It is important to emphasize that the results of the present study were due to improvements in the performance of the training group as opposed to a decrease in that of the control groups. As figures 1 to 3 illustrate, the means of both control groups remained quite similar across assessment periods. The fact that the attention control group did not differ from the no treatment group is noteworthy. Since the purpose of the attention group was

to control for the amount of experimenter interaction, it is evident that the type of interaction was the distinguishing factor contributing to the improvement in the training group. It is important to note that in such a study it is difficult to control for all factors, such as teacher attention or maturation, which might account for higher ratings on the measures of social competence. However, it is unlikely that such factors would affect only those children in the treatment group.

Ratings of peer acceptance did not show improvements until approximately two months following training. This was expected, since learning the communication skills and implementing them into effective strategies for social interaction requires time and practice. At the six-week followup, peer and teacher judgements of the target children did not significantly improve, as sufficient time had not elapsed for noticeable behaviour change to occur. During the following two months, it is apparent that the children were able to influence teacher judgements and to interact more effectively with unfamiliar peers. In addition, many of them continued to receive remedial help in school, and thus had to work to overcome the attached stigma. While unfamiliar peers had no knowledge of the childrens' school behaviour or academic abilities, it remained that the new social skills required further development.

The results of this study support past correlations found between referential communication and social competence. For example, Asher (1978) reported a correlation between referential communication ability and the number of friends children had. Although the study was carried out with normal school children, it appears that similar results apply to those with developmental delays. This is encouraging for all children, as the present study indicates not only that referential communication can be improved, but also that it is an important skill in the social competence repertoire.

The programme used to teach referential communication in the present study was designed from various tasks used in past studies to measure this skill. A combination of listener and speaker components were emphasized, as all were considered equally important. One flaw of the study is that the children were tested only on the speaker component, leaving unknown the influence of listener skills on subsequent changes in communicative ability. Future research might measure both components, and investigate which, if either, is more related to changes in social competence. The present study relied upon unfamiliar peers to assess peer acceptance. An additional method might have been to administer the Social Distance Scale to classmates, and compare them to ratings by unfamiliar peers.

Teachers may attempt to improve their students' referential communication skills by implementing programmes similar to the one used in the present study. The tasks were designed to appear as games to the children, and were usually enjoyed by them. One can also be quite creative in selecting materials for use in these tasks, and in fact can design new activities to teach the same skills.

Training in referential communication need not be restricted to structured programmes carried out at school or in research studies. Parents can provide valuable experience simply by asking their children for clarifications when requests are ambiguous, rather than trying to guess what the children really want. For instance, when asked "Please get me my sweater," of which there may be several, one may seek clarification by replying "Which one do you mean?" Such a response implies to the child that his or her request was not sufficient, and that additional information is required. In fact, Robinson (1981b) showed that children whose parents provide such feedback have more developed communicative skills in comparison to children who receive no such feedback.

Although the children who participated in the present study were delayed in several areas of development, they were nonetheless able to function within a regular school setting. For these children, referential communication has

proven to be an important skill which may continue to play a role in their future development. Children who are more seriously delayed, particularly those with little or no language, initially would not benefit from this type of communication training. Their needs require intense intervention in language development and perhaps other areas prior to training in more specific skills, such as referential communication.

The results of the present study are encouraging to those who are concerned with the many aspects of social competence skills in both normal and delayed children. Communication skills are important in daily interactions, and should not be disregarded as a factor in social competence. A number of questions have arisen from this research, particularly those concerned with the longterm effects of training, and with age ranges for which training is most effective. Also, do personality characteristics, such as shyness or aggressiveness, influence the effects? If so, which characteristics show the greatest change as a result of training? It is hoped that future research will address these questions and others that arise.

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Appendix A

Training sessions

Experimental group

7

Session one was designed to encourage attention to context in an attempt to facilitate comparisons between referents. Each child was seen individually and presented with a sequence of 30 pairs of triangles, with the referent of each pair marked with a star above it. The target referent was different from the other on one of three characteristics: size, colour, and pattern. This task was adopted from Whitehurst and Sonnenschein (1978). The child and experimenter sat with a screen separating them, and for each pair presented, the child was instructed: "Tell me about the triangle with the star above it so that I will know which triangle you are talking about." Feedback was provided after each response, with emphasis placed on the importance of describing the distinctive features of the referent. The children were told either "That's good; you told me how the triangle with the star above it was different from the other," or "That's wrong; you did not tell me how the triangle with the star above it was different from the other."

Session two was adopted from Watson (1977), and involved two groups of four children, with each child taking a turn as speaker, listener, and observer. This session also emphasized the importance of context, but involved peers as listeners. The experimenter hid a stamp under one of four cards, the context of which was altered for eight presentations. The speaker was instructed to

"Tell (name of listener) where the stamp is so that he/she can find it." The observers were asked to comment and suggest alternatives.

Session three, adopted from Roberts and Patterson (1983), was aimed at enhancing perspective taking ability. More precisely, to enable each child to understand that although they know the identity of the target referent, the listener does not. The children were seen in dyads, and acted as both listener and speaker. Prior to the communication of any messages to the listener, the experimenter asked the speaker three self/listener knowledge questions: "Do I know which one is the secret one?"; "Does (name of listener) know which one is the secret one?"; and "Do you know which one is the secret one?" The experimenter then communicated a series of five messages of varying informational adequacy to the listener. The messages were presented as follows: "It's red," "It's round," "It's blue and round," "It's a big blue triangle," "It's a small red triangle." The self/listener knowledge questions were repeated following each message. The child's task was to evaluate the listener's perspective after each message and decide whether or not the listener then knew the target referent. The children were given the opportunity to reformulate messages and provide feedback.

Session four was designed to enhance each child's

understanding of the need to reformulate an ambiguous message following feedback. Each child was seen individually by the experimenter, and a task described by Robinson (1981) was used. In this task, child and experimenter sat at opposite ends of a table with a screen separating them. Both had identical sets of six cards. The six cards consisted of drawings of a man with a pointed black hat, a black top hat, a red flower, a blue flower, a red flag held high, and a red flag pointed down. The object of the game was for the speaker to select a card and describe it so that the listener could choose the matching card from his or her set. The listener was not allowed to ask for more information, nor was he or she given any if a request was made. The experimenter introduced the game by explaining and demonstrating a good message which identified exactly the card she selected. The child then had a turn as speaker. The players continued to take turns, and on some of her turns, the experimenter introduced communication failure by giving ambiguous messages, such as "I want you to find the man with a flower." When the child chose a card, the experimenter indicated that she meant the other one. Following each incorrect selection, the experimenter asked the following sequence of "whose fault" questions: "We've got different cards, we went wrong that time. Whose fault was that, mine or yours? Why? Did I/you tell you/me properly which one to pick? If the child says no: What should I/you have

said? Whose fault was it we went wrong? Why?" The child was asked this series of questions following at least two communication failures, both when he or she was listener and speaker. The subjects were encouraged to ask questions and provide alternatives for each ambiguous response.

Session five was designed by Watson (1981). The children worked in dyads, each taking a turn as listener and speaker. They were separated by a screen and given identical sets of coloured felt figures. The speaker was shown a picture of a design made by the experimenter, and was instructed to direct the listener in replicating it. The listener was permitted to ask questions for clarification. The purpose of this task was to promote efficient communication of information and the identification of distinguishing features and spatial arrays of objects.

Session six, also from Watson (1981), was aimed at encouraging the use of efficient questioning by experimenter modelling. The experimenter introduced the game, and began by giving a clue about the identity of an object pictured on a large poster. The children took turns at providing clues about three objects. The other children were to guess the object's identity by questioning in turn.

Appendix B

Training sessions

Attention control group

In session one, each child was given two turns at telling a story about an 8x10 picture presented by the experimenter. Different pictures were used for each child. The experimenter provided assistance by asking questions to encourage expansion of the story, such as "What would happen if..."

Session two involved two groups of four children. They took part in a board game called the Consonant Game, which was designed to assist them in the recognition and production of two word phrases in which each word began with the same letter. The children took turns throwing dice to move a number of spaces, each of which contained a letter of the alphabet. The object of the game was to produce a phrase using the letter selected. The other children could provide suggestions if help was required.

In session three the children worked in dyads. They were given crossword puzzles designed so that given words were to be printed in the correct places. Letter clues were provided for each word. Each child in the dyad took a turn at correctly placing one word at a time, until the puzzle was completed. The experimenter provided assistance if required.

In session four each child took turns in a game, Spello, designed to assist them with spelling skills. Each

child reached into a small box to select one of six coloured cards. Each of the six colours represented a level of word difficulty. The child was then asked to spell a word and use it in a sentence. If unsuccessful, they were given assistance by the experimenter.

Session five involved the children working in dyads. They were given a number of materials, including paper, coloured markers, glue, and decorations, and were asked to make one of several objects suggested by the experimenter. The children could ask their partner for assistance and suggestions.

In session six, the children participated in a Comprehension Game, designed to assist them in finding the main idea of a short paragraph. In this board game, children threw dice to move a number of spaces, and selected a card from one of two piles. They were to read the short story on the card aloud and then select the main idea from three given choices. The other children could ask questions and provide help if necessary.

Prior to each session, there was a brief review of what was taught the previous week in an effort to strengthen the children's retention of the skills.

Appendix C

Results of t-tests on
pretreatment gender effects

Results of t-tests on pretreatment gender effects

	<u>t</u>	<u>df</u>
Communicating		
All Necessary	1.79	22
Steps Task		
Social Distance	1.56	22
Scale		
Kohn Social		
Competence	.84	22
Scale (FI)		
Kohn Social		
Competence	.81	22
Scale (FII)		



