

Programming

**Programming Generalization of
Social Skills in Hard-of-Hearing
Preschool Children**

By

Dell E. Ducharme

University of Manitoba

A Thesis

Submitted to the Faculty of Graduate Studies

in Partial Fulfilment of the Requirements

for the Degree of

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**PROGRAMMING GENERALIZATION OF SOCIAL SKILLS
IN HARD-OF-HEARING PRESCHOOL CHILDREN**

BY

DELL E. DUCHARME

**A Thesis submitted to the Faculty of Graduate Studies of the University of Manitoba
in partial fulfillment of the requirements of the degree of**

DOCTOR OF PHILOSOPHY

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Abstract

The present study extended Ducharme and Holborn's (1994) experiment on the training and generalization of social skills with hard-of-hearing preschool children. A multiple baseline design (Kazdin 1982, pp. 126-149) across 2 participants was replicated once, with an additional replication across a single participant. The 3 phases in the design were: a) baseline, b) a traditional social-skills training package (modeling, instructions, prompting, reinforcement), and c) the social-skills training package with the addition of generalization programming techniques (i.e., make antecedents and consequences less discriminable, incorporate common salient social stimuli, Stokes & Osnes, 1989). Additional practices (e.g., specification of a fluency criterion in training) associated with successful generalization outcomes in the literature (Chandler et al., 1992) were also employed. Whereas the social skills training package produced high, stable rates of performance in the training room, it was not until the systematic application of generalization techniques that substantial generalization to a relevant interactional setting (Rasing & Duker, 1992) occurred.

The importance of achieving generalized responding of newly acquired behaviors is well documented (e.g., Kirby & Bickel, 1988; Stokes & Baer, 1977; Stokes & Osnes, 1989). Without the transfer of trained skills beyond a restricted set of training conditions, therapeutic effects may be of questionable value (Gresham & Lemanek, 1984; Johnston, 1979), and of limited, if any, clinical significance (Kazdin, 1977).

Over the past two decades, the topic of generalization has received considerable attention. Experimentally, generalization research has been conducted across a wide range of behaviors (e.g., adaptive living skills, gross motor skills, social skills, speech production) and with a variety of target populations (e.g., persons with developmental, neurological, physical and psychiatric disabilities). Theoretically, numerous authors have also provided unique perspectives on, and various strategies for, programming generalization (e.g., Chandler, Lubeck, & Fowler, 1992; Edelstein, 1989; Fox & McEvoy, 1993; Johnston, 1979; Kirby & Bickel., 1988; Stokes & Baer, 1977; Stokes & Osnes, 1989).

Despite the increased amount of attention that programming for generalization has received in the recent research literature, the development of a technology of generalization programming with proven generality (Sidman,

1960) across such variables as subjects, responses, and settings remains at the testing stage. In part, this has been a function of : a) different conceptualizations of generalization among researchers; b) terminological confusion (Fox & McEvoy, 1993); c) a collection of tactics which may lack the discriminative control necessary to guide practitioners in their application of them (e.g., Odom, Hoyson, Jamieson, & Strain, 1985); and d) a paucity of available guidelines for interpreting generalization data. Never-the-less, generalization programming strategies (e.g., Kirby & Bickel, 1988; Stokes & Osnes, 1989) are available from which researchers can pick and chose. Moreover, there have been "best" practices identified in the literature (e.g., Chandler et al., 1992) that, when incorporated into training, may enhance a generalized outcome.

To date, a significant proportion of generalization research has been conducted on the topic of social competence. Social competence, a developmental, superordinate ability comprised of cognitive and behavior-based skills (e.g., problem solving, social awareness, interpersonal goals and strategies), is central to the cultivation of satisfying interactions. When adequately developed, the risk of personal maladjustment and psychopathology is reduced (Odom & McConnell, 1985). Deficiencies in the development of

social skills have been associated with poor academic achievement (Buswell, 1953), with delinquency (Roff, Sells, & Golden, 1972), with dropping out of school altogether (Barclay, 1966), and with emotional and psychiatric problems (e.g., Cowen, Pederson, Babigian, Izzo, & Trost, 1973; Roff et al., 1972). With such social deficiencies, children with developmental and physical disabilities, or with existing psychiatric and emotional disorders are at even greater risk for developmental deviance.

The present study was conducted on the training and generalization of social skills with hard-of-hearing preschool children, with particular emphasis on programming generalization. Rasing and Duker (1992), in a review of the relevant literature, provide a succinct overview of the many social competency challenges that persons who are deaf and hard-of-hearing must overcome. These include: deficits in empathy, communication, and social perception; egocentricity and deficits in impulse control; and a higher prevalence of emotional and behavioral problems. They cite early language deprivation, not deafness per se, as the primary cause of these difficulties and recommend social-skills training as a remedial technique to help ameliorate the long-term social problems (e.g., poorer self-concept development, social isolation) often associated with hearing losses. Despite the identified need for the development

of social competence in persons with hearing losses, less applied research has been conducted on this population relative to others (Lemanek, Williamson, Gresham, & Jensen, 1986; Rasing, Connix, Duker, & Van Den Hurk, 1994).

Despite a lack of depth in, and limited scope of, the social-skills literature with persons with hearing losses, available studies have addressed such important topics as the kind of play behaviours present in integrated and segregated settings (e.g., Esposito & Koorland, 1989; McCauley, Bruininks, & Kennedy, 1976; Vandell & George, 1981), and the management of maladaptive social behaviours (e.g., Forehand, Cheney, & Yoder, 1974). Investigation of the efficacy of various social skills training methodologies has not, however, received much attention (Rasing et al., 1994). Of the related research, the balance of attention has favoured hard-of-hearing school-aged children and adolescents (e.g., Barton & Osborne, 1978; Lemanek & Gresham, 1984; Lemanek, Williamson, Gresham, & Jensen, 1986; Rasing, Connix, Duker, & Van Den Hurk, 1994; Rasing & Duker, 1992) over preschool children (e.g., Antia & Kreimeyer, 1987).

Turning attention to the hard-of-hearing preschool population, preliminary research (e.g., Antia & Kreimeyer, 1987, 1988) supports the application of behavioral principles and procedures to foster desirable peer

interaction. On-the-other hand, empirical support for the application of procedures (e.g., Stokes & Baer, 1977; Stokes & Osnes, 1989) to program the generalization of these same interactional skills is mixed. In one study (e.g., Kreimeyer & Antia, 1988), only minimal effects on fostering generalization of social skills to novel play activities was achieved. In a second study, Ducharme and Holborn (1994) produced generalized responding to novel play activities in a novel setting with trained and an untrained peer(s). The effect of the generalization strategies, however, were not robust enough to consistently prevail over the variation in other variables controlling play for each participant. Programming generalization of social skills with preschool children who are deaf and hard-of-hearing remains a particularly critical area of investigation, as it reportedly is with preschool children in general (Chandler et al., 1992). I will now review the above noted studies on programming generalization with the preschool hard-of-hearing population.

Antia and Kreimeyer (1987; 1988) and Kreimeyer and Antia (1988) conducted preliminary investigations into the training, generalization, and maintenance of social skills with deaf and hard-of-hearing preschool children. Using multiple baseline designs (Kazdin, 1982 pp. 126-135), they measured the effectiveness of teacher modeling and prompting in the context of play

activities to assess whether trained skills would generalize to free-play settings or be maintained following the withdrawal of teacher support. These studies provided initial support for the efficacy of these social-skills training procedures in producing moderate increases in positive peer interaction among deaf and hard-of-hearing children over baseline levels. Methodological issues, such as the absence of treatment integrity checks (e.g., Billingsley, White, & Munson, 1980), lack of specified generalization strategies, and infrequent use of generalization probes make it difficult, however, to interpret the generalization data. Moreover, the assessment of generalization to settings that included "normal" peers and play activities was absent.

Recently Ducharme and Holborn (1994), building upon the work of Antia and Kreimeyer (1987 & 1988) and Kreimeyer and Antia (1988), investigated the training and generalization of social skills with four hard-of-hearing preschool children. A multiple baseline design across participants was used to assess the effects of instruction, modeling, prompting (Kreimeyer & Antia, 1988), and reinforcement on training "play organizing", "sharing and cooperating", and "assisting" (Tremblay, Strain, Hendrickson, & Shores, 1981). To program generalization, a number of Stokes and Osnes' (1989) operant programming tactics were assimilated into the social-skills training

procedures. Methodological improvements over previous studies were also incorporated into the study including: treatment integrity checks; employment of social validation measures; more frequent tracking (50% of sessions) of generalized responding; and specification of a fluency criterion (i.e., 70% social interaction) in training sessions. A fluency criterion, that is a pre-determined level of expected performance, ensures that a minimum standard of competency for the targeted behavior(s) is attained under training conditions.

Ducharme and Holborn (1994) found high, relatively stable rates of target behaviors across all participants under training conditions; lending further support to the application of behavioral techniques and principles for training social skills in deaf and hard-of-hearing preschool children. Noteworthy was the higher level (i.e., 80-100%) of social interaction during training relative to the levels of performance (i.e., approximately 40-60% social interaction) achieved by Kreimeyer & Antia's (1988) participants. The incorporation of Stokes and Osnes' (1989) generalization strategies into training also resulted in the generalization of trained skills to novel, unstructured play settings. Under these unstructured conditions, the trained skills generalized to untrained activities and, with one participant, to untrained peers. This outcome is in contrast to Kreimeyer and Antia's (1988) findings

where generalization occurred to "trained" peers only in the presence of "trained" toys. Ducharme and Holborn's (1994) participants' performance under generalization conditions following training also improved to levels above the social play of a matched control group attending a community program.

Ducharme and Holborn (1994) were unable to evaluate the separate contributions of the social skills training package and the generalization strategies to programming generalization. Moreover, slight modifications (i.e., active manipulation of the controlling variables of behavior, encouraged by Johnston, 1979, if generalization is not occurring) were necessary to facilitate play in two participants under generalization conditions. As previously noted, the effects of the generalization strategies selected did not appear robust enough to consistently prevail over all controlling variables for each child's play.

The present study was an extension of Ducharme and Holborn's (1994) experiment on training and generalization of social skills with hard-of-hearing preschool children. The research represented an extension in two major ways. First, it attempted to analytically separate the contributions of general social-skills training procedures (e.g., Kreimeyer & Antia, 1988) from the systematic

use of a number of generalization programming techniques (Stokes & Osnes, 1989) in producing generalized responding of social skills. Second, the antecedent stimuli for play were to be stimuli (e.g., peers and play activities) natural to the target setting, rather than introduced (i.e., supplemental) for convenience sake.

Consistent with the Ducharme and Holborn (1994) study, the "robustness of the generalization effects" across all participants was enhanced by incorporating a number of procedures or practices suggested in the literature (e.g., Chandler et al., 1992) to program generalization of social skills. These included: a) employing treatment integrity checks (Billingsley, White, & Munson, 1980) across all aspects of the treatment complex; b) specification of a fluency criterion for participant's behavior under training conditions; c) using a multi-component training program (which is comprised of prompting, reinforcement, feedback) and socially skilled peers in the training of social skills; and d) employing a number of generalization programming strategies to produce the desired outcome. In addition to the above, social validation measures (Kazdin 1982; Wolf, 1978) for target behavior selection (Fox & McEvoy, 1993; Rasing & Duker, 1992) were also conducted.

Method

Participants

Participants were 5 hard-of-hearing children ranging from 43 to 62 months of age whose primary diagnosis was hearing loss. Table 1 displays a number of participant characteristics, such as age at diagnosis, etiology of hearing loss, hearing status, and communication levels. All participants communicated orally, were fitted with binaural hearing aids and a Telex FM unit, and attended the Preschool Program for Deaf Children at the Society for Manitobans with Disabilities (SMDI) in Winnipeg, Manitoba, Canada, where the study was conducted.

Participants were chosen based on three specific criteria: presenting without a specific learning problem; having no additional disabilities that would interfere with performing social skills; and absence of an emotional or a psychiatric disorder. Communication skills and hearing level were not included as selection criteria. The presence or absence of a learning problem was determined by informal teacher assessments based on the participants' performance on various classroom and school-related activities.

Table 1.

Participant Characteristics

Participant	Sex	Age at Diagnosis in Years/Months	Etiology of Hearing Loss	Chronological ¹ Age in Years/Months	Unaided ² Pure Tone Average (in dB)	Aided ² Pure Tone (in dB)	Language Development in Years/Months ³ Receptive	Language Development in Years/Months ³ Expressive	Presence of a learning problem
Liz	F	3-9	Gentamycin	4-8	87	48	3-8	2-6	No ⁴
Mark	M	2-6	Gentamycin	4-11	77.5	37.5	4-3	4-0	No ⁴
Tony	M	3-10	Unknown	5-1	48	32	3-6	3-1	No ⁴
Gary	M	1-3	Gentamycin	4-4	55	28	4-8	4-6	No ⁴
Katie	F	3-2	Meningitis	6-0	61	28	3-0	3-0	No ⁴

¹ Age at onset of study² 500, 1000, 2000 Hz in better ear³ Assessed under the Preschool Language Scale-3 Revised (1979)⁴ Based on informal teacher evaluation as determined by children's classroom performance.

The presence or absence of a diagnosed emotional or psychiatric disorder, on-the-other hand, was determined through a review of the childrens' file for authorized documentation.

Participants were also selected on the basis of their mean percentage total target behaviors during 5-min observation periods conducted over 8 consecutive program days in the training and generalization settings during the specified free-play periods. Children with the lowest mean percentage of social interaction in the training setting and who engaged in minimal to no social play in the generalization setting were chosen. Of the 13 potential participants, only 8 children met the first set of criteria. Of these, two were eliminated as potential participants because each exhibited moderate, variable rates of sharing and cooperating in the generalization room during the participant selection phase. The remaining six children were selected as participants based on their baseline performances in the training and target settings. Due to physical illness, however, the sixth child was lost to the study.

Despite the absence of learning difficulties and severe emotional disturbances among the research participants, they were not without difficulties in addition to their apparent lack of social-skills development. Both Liz and

Mark preferred isolated play. Each child was labelled as "shy" by their teachers. Liz was described as unassertive around her peers, and Mark displayed fear responses (i.e., standing in one spot and rocking) when placed into an unfamiliar setting. Tony had a history of intermittent episodes of anger and refusals to comply with teacher requests. Katie was in foster care. She had been removed from her home at the start of the study because of family violence and neglect. She was both sad and angry about her foster placement. Katie went through periods (i.e., days or a week) when she isolated herself from her peers and teachers, and became "defiant" (i.e., taking toys away from the other children, not willing to share, failing to comply with teacher demands). It was believed that the diversity of characteristics with which subjects presented would make for a more "demanding" test of the generality of the independent variables.

Prior to choosing children to participate in the study, a letter explaining the purpose of the research, the participant selection process and training procedures to be employed, issues of confidentiality, voluntary participation, and ability to withdraw their child from the study at any time without penalty was sent to parent(s) and/or guardian(s). Once participants were selected, written parental consent was obtained.

Setting

The study was conducted in the Early Intervention Preschool Centre of the Society for Manitobans with Disabilities (SMDI) in Winnipeg, Manitoba, Canada. The Preschool Program for Deaf Children is part of the Early Intervention Centre, and provides facility-based classroom programs in the afternoons (Monday, Tuesday, Thursday, and Friday). The Preschool Program serves children who are deaf and hard-of-hearing, who are language delayed/disordered, and who are multiply physically disabled.

All data on children's social skills across all experimental phases were collected in the Preschool Program for Deaf Children's oral classroom (i.e., Room 1, participants' regular classroom) and in the Language Program's classroom (i.e., Room 5, the generalization setting). Training was conducted in the participants' regular classroom and generalization was assessed in the Language Program classroom. Room 1 consisted of 7 children (5 of which were chosen as participants), measured 6 by 13m, was acoustically treated, and is structured around various learning and play centres (e.g., language, science, computer). Toys and games typical to normal preschool settings were also present in the room. The room was staffed by a Teacher of the Deaf and an Early Childhood Specialist with daily consultation from a Clinical

Audiologist and a Speech Language Pathologist.

Room 5 was larger than Room 1 (i.e., it measures 16 by 13m), served about 12 children, and was not acoustically treated. Similar to Room 1, learning and play centres were available to the children, as were toys and games appropriate to a preschool setting. Some of the play centres, and the actual play materials present, were different than those found in Room 1. For example, Room 5 established different play centres (e.g., camping, spaceship, movie) every 3 to 4 weeks as new vocabulary was introduced to the children. Room 1, on the other hand, maintained the same centres (e.g., science, house) throughout the school year except to add new materials once a month. Whereas each room had a sand and a water table, the other play materials present, such as puzzles, building and art material, and gross motor equipment were different due to variation in teacher preferences and in the training needs of the two populations. The Room 5 classroom was managed by two Early Childhood Specialists, a Speech Language Pathologist, a part-time Physiotherapist, and a part-time Occupational Therapist.

Room 5 was chosen as the generalization setting primarily because it paralleled an appropriate, socially relevant interactional setting (Rasing & Duker, 1992) to evaluate generalization. Aside from a delay in language, about

three quarters (i.e., eight) of the children in the room had fairly well developed play skills. Thus, Classroom 5 provided the participants with an environment which paralleled a normal play setting. Through all experimental phases, including participant selection, at least two socially competent peers (which served as "untrained peers") and two play activities which fostered sharing and cooperating were available in the room. The hope was that this would ensure a receptive play environment in which to evaluate the efficacy of the treatment procedures.

Trained and Untrained Peers

Trained peers were children in Room 1 who were not selected to be a participant, participants who had completed their involvement in the study, and 5 children from Room 5. Trained peers from Room 5 were selected by their teachers based on the following criteria: normal hearing; regular attendance; absence of any severe behavioral problems; and of at least average social competence in relation to their classmates (as judged by their teachers). Trained peers participated in the social-skills training sessions conducted in Room 1 during Treatment I and Treatment II phases. The inclusion of socially skilled peers in the training of less skilful peers (see Chandler et al., 1992) was done to optimize peer interaction and to create an environment conducive

to training social behaviors. It should be noted that the trained peers from Room I were also deemed socially competent as directly assessed during the participant selection phase.

Untrained peers were children attending Room 5 who were not selected as a participant or a trained peer. As a group, however, untrained peers possessed a range of social competencies, from age appropriate (similar to the trained peers) to below age appropriate levels. Trained and untrained peers came from diverse SEA backgrounds.

During Treatment I and II conditions, participants were not permitted to socially interact with a trained peer (i.e., one-on-one) in Room 5 during generalization sessions. If play between a participant and a trained peer occurred, a teacher or a clinician present in the area was to distract the child by taking him or her to another activity. The need to intercede in the play between a participant and a trained peer in the generalization room occurred on only three occasions. Elimination of play between participants and trained peers in Room 5 produced a more stringent test of generalization (i.e., to an unfamiliar unstructured setting, to novel play materials and activities, and to unfamiliar peers).

Equipment

Two Canon E440 8 mm video cameras with FM Wireless Video Camera Microphone Systems (Realistic, # 32-1226) were used to record the children's interactions across all phases of the study. The play activities incorporated into the training sessions are listed in the Treatment I and II sections to follow.

Target Behaviors

To socially validate the behaviors targeted for treatment, the participants' teachers and parents (prior to the start of the study) were asked to provide feedback on social behaviors they believed to be most critical to teach preschool children. Feedback was obtained via the administration of a questionnaire (Appendix A). Ten different behaviors (e.g., sharing and cooperating, being a leader, saying goodbye) were listed from which the respondents could choose. Based on the respondents' choices, the top three ranked behaviors were incorporated into training. In order of preference, these behaviors were sharing and cooperating, play organizing, and assisting. These behaviors, in past research, have also been effective in setting the occasion for positive peer responding in "normal" preschool children (e.g., Tremblay, Strain, Hendrickson, & Shores, 1981), and have been successfully

Table 2

Target Behaviors

Behavior	Definition
Assisting	Assisting occurs when a child teaches/shows/instructs another child how to do something, or helps a child to assemble an object in response to a request or through self initiation (e.g., offers to help). A request or an offer to help must be verbal.
Play Organizers	Play organizers involve verbal interactions and occur when the child specifies an activity, role, or other play for peers (e.g., "Let's play house", "You be the mother", "Do you want to play...?"), maintains such ongoing activities (e.g., "Now you hold this"), or gets the attention of a peer (e.g., "Look at what I have") to engage the peer in play.
Sharing/Cooperating	Sharing/cooperative play can involve vocal and/or motor/gestural interaction, and can occur under one of four conditions: a) the child offers to share or trade materials with a peer, (e.g., offering a crayon). b) the child simultaneously uses the same material as his/her peer in working towards a common goal (e.g., coloring on the same piece of paper), or is turn-taking (e.g., playing on a slide). c) the child is involved in cooperative play with peers (e.g., playing a game of cards). d) the child attending to the same stimulus within a sharing/cooperative context (e.g., watching a film), and which is not adult directed, but may be supervised for safety purposes (e.g., an obstacle course).

trained in the deaf and hard-of-hearing preschool population (e.g., Antia & Kreimeyer, 1987; Ducharme & Holborn, 1994; Kreimeyer and Antia, 1988), as well as in other preschool populations (e.g., Hendrickson, Strain, Tremblay, & Shores, 1981). The opportunity for teachers and parents to provide suggestions for alternate behaviors not listed in the questionnaire also was provided. A description of the target behaviors is provided in Table 2.

Experimental Design

A multiple baseline design (Kazdin, 1982, pp. 126-149) across two participants was replicated once, with an additional replication across a single participant, was used to evaluate the effects of the social-skills training procedures and the generalization programming strategies on the dependent measures. Generalized responding was measured concurrently, on each training day. The absence of a morning program, and a restricted period of time (i.e., a 30-min free-play period) in which to conduct daily social-skills training and generalization sessions, precluded the application of more than three concurrent baselines.

In an attempt to analytically separate out the contributions of a general social-skills training package (i.e., Treatment I, Kreimeyer & Antia, 1988) on producing generalized responding from the systematic use of a number of generalization techniques (i.e., Treatment II, make antecedents less discriminable, make consequences less discriminable, Stokes & Osnes, 1989), three phases were incorporated into the design. These were Baseline (Phase A), Treatment I (Phase B), and Treatment II (Phase BC).

Experimental Procedures

Children's orientation

Two weeks prior to the start of the study, the experimenter introduced himself to the children in Rooms 1 and 5, and provided them with a general overview of the purpose of the study (i.e., "With your teacher, I will be helping you play more together. We will do this by playing with a lot of different toys and games. Some of you may be going to Room 1 to play with the children there. I will tell you more about that later."). The video equipment was also made available to the children to see and to touch, followed by 4 consecutive program days of videotaping to reduce potential reactivity to the experimenter and to the camera. The children adapted quickly to being videotaped. By the second day of videotaping, they went about their play without attending to the experimenter or asking to play with the camera.

Participant Selection

Over 8 consecutive program days, baseline measures of children' social interaction in the training and generalization settings were obtained. In each setting, children were videotaped for 5 consecutive min during free play (i.e., 1 - 1:30 pm). The orders in which the children were videotaped and were placed in the training and generalization settings were randomized. Free play

was unstructured and child directed. Teachers were to intervene in the children's play only to settle physical or verbal disputes. Such disputes never occurred.

To increase children' comfort and personal sense of safety in Classroom 5, introductions to staff were made, children were told that they could play with whatever they liked, and they were shown the play materials on their first two visits. Staff would also greet the children when they entered the classroom. A teacher from Classroom 1 also accompanied the participants to Classroom 5 on their first visit and remained with them (i.e., away from the play, at the entrance of the class) for the 5-min session. To evaluate the discriminative control of teacher instruction over play, all potential participants (i.e., those children from Room 1) were provided with a teacher prompt (e.g., "It is time to play, please go find someone to play with." and then were left to play) at the beginning of each 5-min session in Classrooms 1 and 5 during the last 3 days of subject selection.

All potential participants, except two who interacted at moderately high rates (i.e., approximately 40 - 60% social interaction), failed to interact with a novel peer in the generalization setting during this phase of the study. Parallel and solitary play (Parten, 1932) was observed most often in the children,

although some did elect to stand in one spot (i.e., onlooker behavior, Parten 1932) and watch the activity around them. In Room 1 (i.e., the training room), the potential participants' frequency of play varied with low to no rates of sharing and cooperating observed overall. The data collected on the play of the children under participant selection conditions paralleled the data collected on the same behaviors under baseline conditions. Based on these data, cooperative play of the children did not appear to be under the instructional control of the teachers in either the training or generalization settings.

Baseline

Baseline data on participant' target behaviors were collected under the same conditions as present during participant selection. Baseline assessments were conducted daily in both training (Room 1) and non-training (Room 5) classrooms during the specified free-play period. Play remained unstructured, child directed, and free from teacher intervention. As during the participant selection phase, the instructional control of a teacher's prompt for the participants' play was evaluated during the last 3 days of baseline. As the data indicate, this verbal prompt did not set the occasion for play in either setting.

Treatment I

Treatment I closely approximated the social-skills training procedure

employed by Antia and Kreimeyer (1987) and Kreimeyer and Antia (1988) in their work with hard-of-hearing preschool children. Instructions, modeling, prompting, and reinforcement (Ducharme & Holborn, 1994) were employed by teachers to teach the participants a number of target behaviors (e.g., play organizers, sharing and cooperating, and assisting), with two play partners (trained peers from the training room) incorporated into the training sessions. Age-appropriate games and activities were also selected and used to set the occasion for play. However, unlike Antia and Kreimeyer and Kreimeyer and Antia who employed multiple play activities and routines to teach target behaviors, the number of play activities under Treatment I conditions in the present study was restricted to two. The behavior-change strategies (i.e., modeling, prompting, instruction, reinforcement) incorporated in the present study were also used in the Ducharme and Holborn (1994) experiment, and have been identified by Chandler et al. (1992) as associated with successful generalized outcomes when employed with generalization programming strategies (e.g., "make antecedents less discriminable", "contact natural consequences"; Stokes & Osnes, 1989).

Treatment I, as a function of the training techniques employed, naturally embodied generalization strategies (e.g., Stokes & Osnes, 1989),

albeit limited in number and extent. For example, by training three (i.e., a variety) responses (target behaviors) that later would potentially come into contact with natural, powerful, reinforcing consequences and which comprised a subset of responses representative of the target response class, the generalization programming strategies of "contact natural consequences" and "use sufficient response exemplars" (Stokes & Osnes, 1989) were presumably operative, at least partially. The strategies of "incorporate common salient social stimuli" and "incorporate common salient physical stimuli" (Stokes & Osnes, 1989) were implemented to some degree as well. Whereas the general stimulus classes of "peers" and "play materials" can be considered common salient (social and physical respectively) stimuli (respecting their similarity to stimuli present in the target setting), the number of these stimuli presented in training under Treatment I conditions was restricted. In describing these two procedures, Stokes and Osnes (1989) use examples from the literature which suggest that the use of a variety of stimuli from each class in training can be an important component of this procedure, although they do not explicitly state this in their description of them.

Despite the natural embodiment of the above generalization programming strategies into the Treatment I social-skills training package

(e.g., Antia & Kreimeyer, 1987; Kreimeyer & Antia, 1988), it was hypothesized that they (although necessary for programming generalization) would not prove to be sufficient in producing the desired outcome in the absence of systematic generalization programming. That is, alternating a variety, and potentially representative sample of stimuli across training sessions to establish a high correlation between them and reinforced responding (Keller & Schoenfeld, 1950) as suggested in the generalization strategy of "make antecedents less discriminable" (Stokes & Osnes, 1989) was absent.

Selection of activities. Teachers were asked to select games and/or play activities that they believed, based on their knowledge of the participants and of the developmental literature, would be easy to teach, require minimal teacher assistance following training, maintain the children's interest during training sessions, and set the occasion for play organizers, sharing and cooperating, and assisting. The games and activities selected for Treatment I were face painting and the Original Matching Game® (1986).

Restriction of the number of teachers and play activities employed. So as not to inadvertently program for generalization (i.e., the strategy of "make antecedents less discriminable", Stokes & Osnes, 1989), the social-skills

training sessions were conducted by the same teacher and, as indicated previously, the number of trained peers and activities was limited to two of each. Although one trained peer and one play activity would have been preferred from the perspective of an experimental analysis, it was believed too monotonous for the children. Moreover, two trained peers ensured the availability of a play companion for the participant when one child (i.e., trained peer) was ill or refused to play, and provided better opportunities to train participants to be persistent in locating a peer with whom to play. Specifically, if the first trained peer refused a participant's request to play, a second peer could then be approached. It was hypothesized that alternating only two children and two activities across training sessions would not constitute sufficient programming for generalization (variously labelled as "repeatedly present members of a naturally occurring stimulus class", Kirby & Bickel, 1988; "train loosely", Stokes & Baer, 1977; "make antecedents less discriminable", Stokes & Osnes, 1989).

Social skills training procedures. At the start of each session, the teacher organized the play area by putting out the face paints and the matching game. By calling, or bringing the participants to the play area, the teacher prompted the participants to select an activity of choice. Once the activity was

selected, the teacher asked the participants to choose one of the two trained peers to play with, then instructed them to ask a peer to come and to play the selected activity. If the participants followed through successfully, they received descriptive praise and/or prompting from the teacher (e.g., "Good asking, that was a nice loud voice you used"; or "Good asking, but maybe next time you can ask in a bigger voice"). If, following 30 seconds, the participants were unsuccessful in securing a play partner a second, and more behaviorally-specific prompt was provided (e.g., "Johnny, Carl and Helen are over there playing with one another. Why don't you go over and ask one of them to play face painting with you?"). If the participants successfully asked a trained peer to play they received teacher praise. If another 30-seconds elapsed without success, the teacher took the participants to one of the trained peers and modelled, for them, how to organize play. After teacher modeling, the participants were asked to model back what they had just observed. The participants were again instructed to ask a trained peer to play. Following this level of assistance, teacher praise was not provided so as not to inadvertently reinforce subjects for responding at this level of assistance.

On occasion, a trained peer refused to play when approached by a participant. Upon the first refusal, the teacher prompted the participants to

repeat their request while giving them a possible explanation for the trained peer's response (e.g., "Try and ask again, but maybe Carl just wants to play alone today." or "Maybe Carl doesn't want to play the matching game, try and ask him one more time. If he doesn't want to play, maybe Susie does.").

When participants' requests were denied by either the only available trained peer (due to illness of the second trained peer) or by both trained peers, the teacher "coached" a trained peer into playing with the participants. The need for teacher coaching totalled six instances. Teacher "coaching" proved successful on each occasion. Participants' experience of refusal to play ranged from 2 - 5 occurrences (i.e., 6 -15% of sessions).

Once seated at the play area, the teacher re-stated the activity selected (e.g., "We are going to face paint."), then instructed the children on how to play the activity while modeling the target behaviors. Important behaviors modeled were turn taking and sharing, play organizing (e.g., "I want you to make me a clown, put red on my nose."); "Your turn."), and assisting ("Let me hold the mirror for you."). The teacher continued training until she believed that the children could play independently (i.e., usually after the children demonstrated a capacity to perform the activity). Before leaving the immediate play area, the teacher set the occasion for play by saying: "You

understand how to play this really well. Now, the two of you can play alone."

The participant was again prompted to ask the trained peer to play, providing the child with additional practice in organizing play. The teacher then left the immediate area and remained in view of the researcher or a research assistant, and the children. The 5-min play session then began.

During the 5-min play session high, stable rates of play were maintained by the teacher through a series of graduated prompts, from least to most intrusive (i.e., two verbal prompts followed by a physical prompt; Ducharme & Holborn, 1994). For example, the first verbal prompt (e.g., "Johnny, please play") was provided when a participant failed to exhibit a target behavior following 30-sec of play. If 10-sec elapsed following the first verbal prompt to play without the participant displaying a target behavior, a second verbal prompt to play (e.g., "Johnny, you are not playing. Please play with Carl.") was to be provided. If another 10-sec elapsed without an appropriate response, the participant was to be physically guided to play.

Across all participants, not one physical prompt was delivered. For Liz, Mark, Tony, Gary, and Katie 80%, 100%, 76%, 74%, and 93% of all their training sessions were prompt free, respectively. In total, each received 11, 0, 20, 10, and 2 verbal prompts throughout Treatment I and II conditions,

also respectively. The maximum number of verbal prompts received by a participant in one session was four.

Participants (and trained peers) were provided with social praise for sharing and cooperating, play organizing, and assisting under treatment conditions only. Under Treatment I conditions, social praise was delivered on a fixed duration (FD) 30-second schedule of reinforcement. Following 3 consecutive days of 70% appropriate responding (i.e., presence of target behaviors) across all observation intervals for each training session, the schedule of praise was "leaned" to a FD 60-second schedule. This schedule remained in effect for the duration of the Treatment I phase so as not to inadvertently program generalization (e.g., strategy of "make consequences less discriminable", Stokes & Osnes, 1989). Based on experience from the Ducharme and Holborn (1994) study, a 30-second schedule of praise could interfere with play. Leaning the schedule from every 30-sec to every 60-sec under Treatment I conditions served to reduce potential teacher interference in the children's play while maintaining the target behaviors under what appeared to be a fairly enriched schedule (i.e., every minute) of praise.

To assist the teachers in their implementation of all training procedures (such as the prompting and reinforcement schedules), prompts throughout each

training session were provided by either the researcher or by one of three research assistants recruited for the study. Two of the assistants were enrolled in their fourth year of a psychology honor's program. The third assistant had a M.A. in psychology, and was employed as a behavioral specialist in the social services field.

While videotaping the training session, the researcher (or an assistant) timed the play of the participants to provide the teacher with prompts on when to deliver praise, and when and how to prompt a participant. For example, following 30-sec where no play between a participant and a trained peer was observed, the teacher (if required) was signalled to deliver the first verbal prompt. If the participant responded appropriately, a prompt (if necessary) followed for the teacher to praise the children for their play. If the participant did not respond within 10-sec of the teacher's first verbal prompt, the teacher (again if required) was signalled to provide a second verbal prompt. At the specified time intervals, if necessary, the teacher was also instructed to praise the children for playing.

Prompts to teachers on prompting participants to set the occasion for play (i.e., with a play organizer) and to reinforce the participants for doing so were also provided. The "rule of thumb" was that prompts were provided to

teachers when a procedure was omitted or added, delivered in the wrong sequence, or for any deviation in the treatment protocol.

Treatment II

Treatment II conditions were comprised of those conditions under Treatment I, with the inclusion of the additional systematic programming of the generalization strategies "make antecedents less discriminable" and "make consequences less discriminable" (Stokes & Osnes, 1989). The first strategy served to broaden the class of stimuli controlling social responding by using a sequence of multiple stimulus exemplars in the training conditions. The second strategy hypothetically served to prevent the delivery of teacher praise from becoming a discriminative stimulus for play and/or to maintain social behavior in the target setting without direct teacher reinforcement. A variation of the strategy "incorporate common salient social stimuli" was also employed. In contrast to its application under Treatment I conditions, teachers and peers from the target setting were incorporated into Treatment II procedures rather than social stimuli from the training setting alone.

Under the first strategy, five additional children (seven in total) from the generalization room were incorporated into the training sessions as trained peers. Three additional teachers (four altogether) from Rooms 5 and 2 were

recruited as well to conduct training sessions on an alternating basis, and a variety (ten additional) of play activities were used in the training session in addition to those used in Treatment I. These activities were selected using the same criteria employed under Treatment I conditions to select activities.

Treatment II activities were: face painting, Sesame Street Simple Shapes[®] (1989), Sesame Picture Hunt[®] (1989), the Original Matching Game[®] (1986), Number Puzzles Game (1989), Photo Object Beginner's Lotto[®] (1991), Candy Land[®] Bingo (1978), Aquarium[®] Jumbo (1979), shaving a balloon, "sticker dot fun" (i.e., placing small stickers on body parts), making clown faces, and Marble Tower[®] (1990). These stimuli were then varied across the training sessions to allow for a variety in the training conditions and to establish a high correlation between them and reinforced responding. Varying stimuli in this manner parallels the procedure used to develop concepts described by Keller and Schoenfeld (1950). The procedures are analogous to Treatment I's training condition except that under Treatment I the stimulus conditions in training were narrow (i.e., two peers from the training room, one teacher, and two activities).

The second strategy of "make consequences less discriminable" (Stokes & Osnes, 1989) was employed to: a) reduce the probability that either the

social praise, the timing of its delivery, or the individual delivering it would become a discriminative stimulus for play; b) have the training schedule of social praise more closely approximate the natural schedule of reinforcement in the target setting and ; c) make the target behavior(s) more resistant to extinction. These targets were accomplished by leaning the schedule of social praise from an enriched (i.e., a FD 30 and 60-sec) schedule under Treatment I conditions to more intermittent schedules (e.g., FD 120, 180, 240, 300), then to no social praise at all during the training sessions. It was hypothesized that once social praise was removed, that natural reinforcers (i.e., play activities, trained peers, social interaction) would still be operative to maintain the children's play.

When participants were introduced to Treatment II conditions, a FD 60-sec schedule of praise was in effect from Treatment I conditions. Following 3 consecutive days of responding (i.e., presence of target behaviors) at 70% or greater over all observation intervals for each training session, the social reinforcement schedule was "leaned" to a FD 120-sec. Employing the same criterion, the schedule of social praise was leaned to a FD 180-sec, FD 240-sec, and a FD 300-sec followed by no programmed social praise after 3 days of responding at 70% or greater across all training sessions. Liz, Tony, and

Katie were eventually maintained on no praise during training, with Mark and Gary being maintained on a FD 120-sec schedule simply due to shorter Treatment II phases.

Generalization Sessions

The assessment of generalization in Classroom 5 was conducted daily across all experimental phases. Daily generalization sessions provided more precise tracking of treatment effects in producing generalization than would have been afforded with intermittent probes.

At the beginning of each generalization session under Treatment I and II conditions, participants were told by a teacher that it was time to play and then were instructed to find someone with whom to play. The 5-minute play session then began and the participant was free to choose what to do and with whom to play. Teachers were not to intervene in the play of participants during these sessions except to settle disputes, or to prevent a participant and a trained peer from playing together to ensure a more strict test of generalization (i.e., to novel peers). Altercations requiring teacher intervention never occurred and participants and trained peers needed to be separated on only three occasions for playing together. Teacher praise for play was not provided to the children during the generalization sessions.

Data Collection and Scoring Procedure

Participants' play was videotaped for 5-min during the specified free-play periods in the training and target settings. The order that the children participated in training was randomly determined on a weekly basis, and training sessions always preceded generalization sessions.

Each day the participants' videotaped behavior was observed by trained observers who were employees (i.e., an audiologist and a speech-language pathologist) of the SMDI Preschool Program. A 5-sec observe 5-sec record interval sampling procedure (Ducharme & Holborn, 1994; Kreimeyer & Antia, 1988) was employed to record the frequency of occurrence of the target behaviors. An audiotape cued observers when to observe and when to record. All training sessions and generalization sessions were videotaped.

Observer and Teacher Training

Two observers (as described above), in addition to the researcher, were used to collect data. Both observers were employees of the SMDI Preschool Program and were selected based on their willingness to serve as observers and their availability of time. Each observer received training from the researcher prior to their participation in the study. Observer training consisted of printed handouts, a review with the researcher of the behavioral categories

and observation system used, and a written closed-book exam. Each observer successfully completed the training by obtaining a score of 100% correct on the exam, and by maintaining a standard of 90% interobserver agreement on 3 consecutive 5-min observation trials on videotaped recordings obtained during the participant selection phase.

The one-day inservice provided as part of the teachers' training in the Ducharme and Holborn (1994) study was not conducted in the present study as the participating teachers had already participated in the inservice for the previous study. In its place, the researcher met individually with each teacher (four all together) to review the handout and to administer the exam (Appendix B). All teachers met the standard of 85% correct responses on the exam, and were able, following repeated practice (i.e., role playing) with the researcher to model the appropriate teaching procedures on two consecutive trials.

Interobserver-Reliability Checks

Interobserver reliabilities (IOR's) on the occurrence of the target behaviors (play organizing, sharing and cooperating, and assisting) for each participant were calculated using a point-by-point agreement ratio (Kazdin, 1982, pp. 53-56). Agreement was scored on the occurrence of a specific target behavior. Interobserver reliabilities were calculated by dividing the

number of agreements by the number of agreements plus disagreements and multiplying by 100. Interobserver reliabilities were conducted on a minimum of 25% of all observations across all experimental phases in both the training and generalization settings. Interobserver reliabilities were conducted a minimum of once per week on the training and the generalization sessions.

Training room data

Interobserver reliabilities collected on the observations of the participants' behaviors (i.e., play organizing, sharing and cooperating, and assisting) in the training room across all (i.e., subject selection, baseline, Treatment I & II conditions) experimental phases ranged from 86% to 100% with mean rates of agreements of 95%, 98%, and 100% respectively.

Generalization room data

Interobserver reliabilities collected on the three target behaviors (i.e., play organizers, sharing & cooperating,, assisting) across all experimental phases ranged from 90 to 100% with mean rates of 99%, 99%, and 100% respectively.

Treatment Integrity Checks

Treatment integrity checks (Billingsley, White, & Munson, 1980) were conducted during the social-skills training sessions and generalization sessions

for each participant. Treatment integrity checks conducted on teachers' behaviors during the social-skills training sessions and the generalization sessions were calculated by dividing the number of procedural components completed following the established procedural protocol by the total number of procedural components multiplied by 100. An omission of a procedural component (i.e., failure to praise or to provide a prompt), deviation from treatment procedures (e.g., providing a physical prompt before two verbal prompts), or providing additional prompting or praise was scored as an error.

The treatment procedure followed by the teachers in the social-skills training sessions and the generalization sessions consisted of 9 to 28 and 1 to 3 components, respectively. The number of components required in training or during a generalization session was a function of the level of assistance required by a participant to learn an activity and to cooperate with a peer, the schedule of praise employed in the training session, and whether in the target setting intervention by a teacher was required. If a teacher were to fail to perform 80% or more of the social-skills training procedures correctly, then they would receive feedback from the researcher prior to the next training session.

Treatment integrity checks were conducted by two observers on 25% of all social-skills training and generalization sessions under Treatment I and II conditions. The mean rate of agreement across sessions was 96% with a range of 89% to 100%. As the data indicate, treatment procedures were consistently applied by the teachers as intended across all participants over all aspects of the treatment complex.

Social Validation

Two questionnaires (i.e., Parent and Teacher, Appendices C and D respectively) were administered at the completion of the research project to: a) assess whether parents and teachers maintained their view that the target behaviors incorporated into training were behaviors of choice for social-skills training; b) evaluate the perceived effectiveness of the training procedures for teaching the target behaviors and for promoting generalization of these trained skills; c) investigate further generalization of the target behaviors to the natural environment; d) review the benefits accrued by the participants, trained and untrained peers, and the teachers for participating in the research project; e) receive the teachers' views on the perceived benefits and drawbacks of having participated in the project; and f) survey overall satisfaction with the study's

outcome and opinion on whether the participants benefitted from their involvement.

Prior to answering the questionnaire, the researcher met separately with the teachers from Classrooms 1, 2, and 5 to review the outcome of the study by presenting the research data of each participant in graphical form, reviewing the experimental design and the various phases of the experiment, and providing a general interpretation of the data based on the criteria set forth in the literature for single-case research designs (e.g., Kazdin, 1982, pp. 230-240). Teachers were encouraged to ask questions about any aspect of the study during the meeting, and then were left to independently and anonymously complete the questionnaire. A copy of each participant's graph was provided to each teacher to refer to while completing the questionnaire. Teachers were provided with the option of returning to the researcher to ask for clarification about the questionnaire or about the study and its outcome. Teachers did not elect to exercise this option.

Questionnaires were distributed to the parents during a home visit by the researcher two months following their child's completion of the research project. During the home visit, the general purpose of the study was reviewed, an explanation about the experimental design was provided, and a

general interpretation of the data was given. In addition to reviewing the performance of all the children who participated in the study, parents were provided with a copy of their child's graph and a 60 - 90-min videotaped recording of their child under all experimental conditions (i.e., Baseline, Treatment I and Treatment II) in both the training and target settings. The contents of the videotapes were determined by randomly drawing from dates (separated by phase) that each participant participated in the study. Findings from the Teacher and Parent questionnaires will be reviewed in the Discussion section.

Results

A multiple baseline design (Kazdin, 1994, pp.126-149) across two participants replicated once, with an additional replication across a single participant, was used to evaluate the efficacy of the social skills training procedures and the generalization programming tactics (Stokes & Osnes, 1989) on the training and generalization of play organizers, sharing and cooperating, and assisting. The data collected on the three target behaviors were collapsed together to create a "Percentage Social Interaction Category" for simplicity of visual display, and because of the low frequency with which play organizers occurred. All data (Figures 1 & 2) were converted into percentages by

Figure Caption.

Figure1. Percent social interaction in training and generalization settings for Liz, Mark, Tony, and Gary across experimental phases.

Note 1. A = absence.

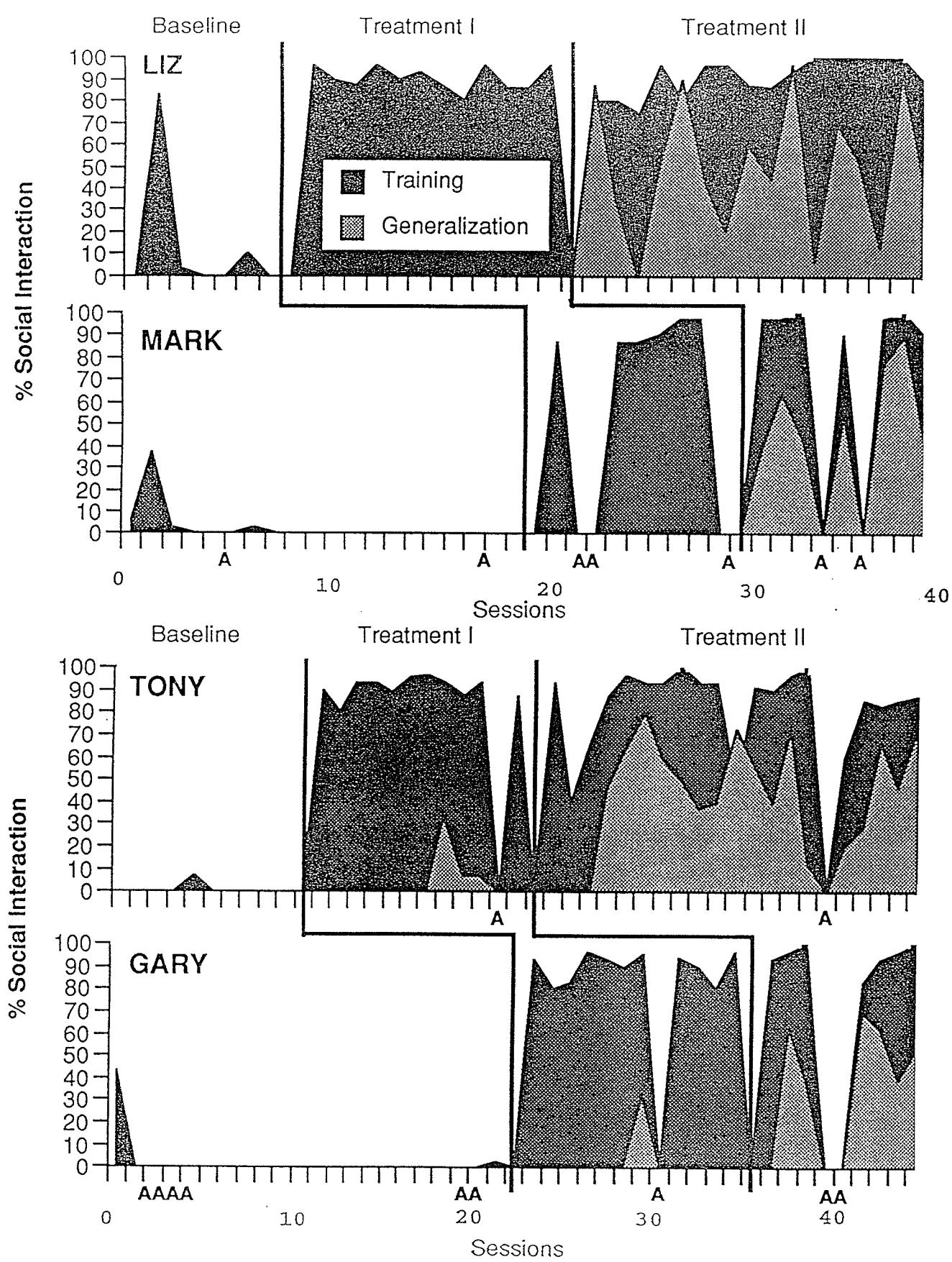
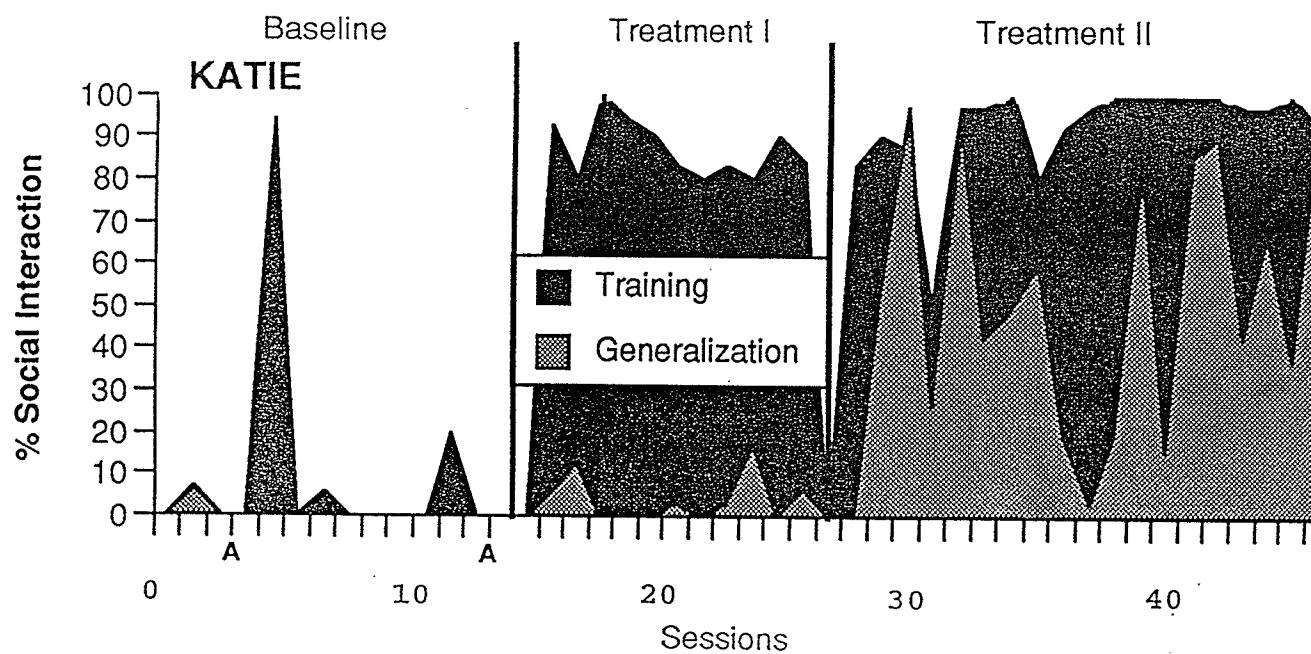


Figure Caption.

Figure 2. Percent social interaction in training and generalization settings for Katie across experimental phases.

Note 1. A = absence.



dividing the number of intervals in which a target behavior occurred by the total number of observation intervals and multiplying by 100. Training data are represented by the dark shaded area and the generalization data by the light shaded area.

The experimental criteria used to evaluate the effectiveness of the independent variables are based on guidelines set out in the literature (e.g., Kazdin, 1982, pp. 230-240; Martin & Pear, 1992, pp. 283-286) for single subject research designs and the visual inspection of charted data. Baseline data collected in the training room were used as the standard by which Treatment I and II's training data were evaluated. As the social-skills training procedures remained virtually unchanged between the two treatment conditions save for the systematic application of a number of generalization techniques (Stokes & Osnes, 1989), changes in subjects' training performances were not anticipated. Thus, a comparison between Treatment I and II training data was not of immediate interest. Regarding the generalization data, baseline measurements from the generalization room served as the standard by which Treatment I's generalization data were evaluated (Chandler et al. 1992). Treatment II's generalization data were evaluated in comparison to generalization data collected under both baseline and Treatment I conditions.

Training Setting

Under baseline conditions in the training room, social play between participants and their hard-of-hearing peers generally occurred at a zero frequency with sporadic exceptions. Subjects primarily engaged in solitary and parallel play, or interacted with the teacher. There were occasions when a high rate of play between a participant and a hard-of-hearing peer occurred, but these remained isolated instances. When Treatment I was introduced, immediate and dramatic changes (i.e., from approximately 0% to over 85%) in social interaction across all participants were observed. High and fairly stable rates of play (94% of all sessions were at or above 80% social interaction), with the exception of a few instances for Tony and Katie, were maintained throughout Treatment I and II conditions.

Generalization Setting

Across all participants, generalized responding under baseline conditions was virtually non-existent, and marked improvements in social interaction following the introduction of Treatment I conditions were not observed for any participant. For Liz and Mark, no social play occurred in the generalization room in the Treatment I phase despite the occasional approach by some children to interact. For Tony and Gary, a few instances (a total of

4) of sharing and cooperating were observed, but these proved to be isolated instances which occurred further into the phase. Katie, on the other hand, demonstrated more improvement over her baseline levels and in comparison to the other participants. Her level of social play, however, was intermittent and never exceeded 18% of a given session.

With the introduction of Treatment II conditions, a positive and relatively immediate (except for Tony) effect on participants' performance resulted. A systematic increase in social interaction across all participants throughout this treatment phase was also observed, as was a marked shift in participants' mean rate of performance as compared to baseline and Treatment I data. Liz and Mark's mean rates of generalized responding under Treatment II conditions were 51% and 59% respectively, as compared to their 0% rate of social interaction under baseline and Treatment I phases. Tony and Gary also displayed substantial improvements in their mean level of social play over baseline and Treatment I data. Their respective mean rates of generalized responding under Treatment II conditions were 46% and 47% as compared to their rates of 0% and 0% social interaction for baseline, and 4% and 3% for Treatment I conditions respectively. Finally, Katie's mean rate of play improved to 52% under Treatment II conditions from approximately 0% and

6% mean rates of performance under baseline and Treatment I conditions, respectively.

Overlap between Treatment I and Treatment II data across all subjects was minimal, and there were only 5 sessions (i.e., representing 8% of all available sessions) during which no play occurred under Treatment II conditions. This is in sharp contrast to Treatment I conditions where social interaction was absent for approximately 80% of all the sessions. Although play was highly variable (i.e., from 0% to 98% social interaction) under Treatment II conditions, this was anticipated respecting the highly unstructured nature of the play (generalization) environment.

Discussion

The behavioral treatment package consisting of instructions, modelling, prompting, and reinforcement in the context of teacher-directed play sessions produced high (i.e., mean rates of responding over 80% social interaction across all subjects), and fairly consistent rates of social interaction under both treatment conditions in the training setting. These results are similar to the level of responding attained by Ducharme and Holborn (1994) under their training conditions, and are an improvement over the training data obtained by Antia and Kreimeyer (1987; 1988), and Kreimeyer and Antia (1988) who, with

similar participant groups, attained mean rates of social interaction between 40% and 60%. The higher level of responding attained by the participants in the present experiment [and in the Ducharme and Holborn (1994) study] over the work of Antia and Kreimeyer (1987; 1988), and Kreimeyer and Antia (1988), is probably attributable to the present study's use of a fluency criterion, treatment integrity checks, and an enriched prompting procedure to maintain high, stable rates of play under treatment conditions.

The generalization programming strategies (based upon operant principles, Stokes & Osnes, 1989) introduced under Treatment II conditions helped to facilitate marked, generalized social interaction with new peers, in a novel setting, and with novel play activities (i.e., in a socially relevant interactional setting, Rasing & Duker, 1992) in the absence of teacher prompting and reinforcement of generalized responding. With baseline and Treatment I data as the standard of comparison to evaluate treatment outcome, the present study achieved what Chandler et al. (1991) describe as "complete generalization" success, that is, generalized responding which exceeded that obtained in baseline conditions. Generalized responding under such stringent test conditions as employed in the present study is not frequently found in the literature (i.e., at least 27% or less of studies, Chandler et al., 1991), and has

been noticeably absent in prior research with hard-of-hearing preschool children (e.g., Kreimeyer & Antia, 1988) with the exception of Ducharme and Holborn (1994).

Social validation measures were used to select the target behaviors prior to the study. Those behaviors selected were once again validated at the completion of the research project by parents and teachers as the behaviors of choice for social skills training. Parents and teachers also reported high satisfaction with the selected training procedures to teach social skills and to program generalization, as well as with the outcome of the study. Each saw benefits to training social skills in preschool children, and reported interest in participating in a similar, future research project. All parents reported positive changes in their child's play at home and in the natural community as well. Acknowledging the limited interpretive value of parents' reports based on their informal nature, more formal assessment of generalization in a variety of non-training settings would be an important focus for future research. A more detailed review of the social validation data is provided in Appendix E.

The present study attempted to analytically separate the contributions of training from generalization programming procedures in producing generalized responding of social skills. It is difficult to say whether this type of separation

was successful, or even possible, as a number of generalization strategies (e.g., "contact natural consequences", "use sufficient response exemplars", "incorporate common salient social and physical stimuli", Stokes & Osnes, 1989) were naturally, and unavoidably incorporated into the Treatment I training package. Consequently, the analysis more closely approximated an evaluation of the effects of different combinations of programming tactics, or variations in their application, on producing generalized outcomes.

Under Treatment I conditions, little to no responding in the generalization room was observed despite the application of a number of recommended generalization programming strategies (Stokes & Osnes, 1989). This is in sharp contrast to Treatment II data where substantial, generalized responding across all participants was present. Failure of the target behaviors to generalize under Treatment I, relative to Treatment II conditions, was probably a function of the relatively narrow (i.e., two peers, two play activities, and two teachers) range of stimuli employed in the discrimination training process for the former condition.

Under Treatment I conditions, a restricted number of stimuli were used in training to parallel the training conditions described by Kreimeyer and Antia (1988) where the number of peers and teachers involved in training were

limited; albeit a range of play activities had been utilized. The present strategy served to restrict generalization of the target behaviors under Treatment I conditions. It has been suggested (e.g., Stokes & Osnes, 1989), and research has demonstrated (e.g., Salmon, 1991), that sampling a representative (or diverse) number of stimuli (i.e., the strategy of "make antecedents less discriminable" which was incorporated into Treatment II, Stokes & Osnes, 1989) from the intended class of controlling stimuli can be an essential component of discrimination training to facilitate generalization. Moreover, under this procedure, as few as three or four stimuli incorporated into a discrimination training paradigm may establish the desired antecedent properties of a stimulus class (e.g., Salmon, 1991).

In the present study, the stimulus classes of "peers", "play activities", and "teachers" probably served as the controlling stimulus classes for play under Treatment II conditions. Without having performed a functional analysis of the controlling stimuli for play, however, conditional stimulus control (Kirby & Bickel, 1988) may have been operative. The presence of the researcher, research assistants, and video equipment may have entered into a conditional stimulus control relationship with the stimulus classes of "peers" and "play activities" over the children's social interaction. Using common

social stimuli from the target setting (i.e., teachers and peers from Room 5) to facilitate generalization of the target behaviors may have contributed to the success of Treatment II as well. Whether incorporating stimuli (social and/or physical) from the target setting(s) into training, or those not from the target setting but which are similar (i.e., from the same stimulus class), produces a differential effect on generalization awaits further empirical study.

Although the strategies "naturally" present under Treatment I conditions did not appear sufficient to program generalization in the absence of other tactics (e.g., "make antecedents less discriminable", Stokes & Osnes, 1989), there should be little question as to their central role in the outcome of the study (given their presence under Treatment II conditions as well). If only Treatment II conditions had been implemented in the present study, generalization would have emerged (Stokes, Baer, & Jackson, 1974), but potentially at a slower pace (i.e., over more than three or four sessions for all subjects). That is, the discrimination training that took place under Treatment I conditions (with the two children and two play activities) potentially represented the first and second exemplars of the three or four that were potentially required for the stimulus classes of "peers" and "play activities" to develop their controlling properties over the participants' behavior.

The success of the present study in the training and generalization of social skills is likely, in part, related to variables distinct from the generalization programming tactics. These include many of the practices (i.e., technological and methodological features) that were incorporated into both Treatment I and II conditions, and that have been associated with successful treatment outcomes (Chandler et al., 1991) in related studies. For example: implementation of a multi-component training strategy which incorporated into its methods prompting, reinforcement, instructions, and feedback; specification of a fluency criterion; intervention occurring over a larger number of sessions; and use of baseline data to evaluate treatment outcome. The application of treatment integrity checks, the presence of at least two socially skilled untrained peers and two play activities to foster social play in the generalization room, and the daily tracking of generalized responding (which may have served to increase participants' contact with the natural community of reinforcement in the generalization room) may have also contributed to the positive outcome.

Noteworthy is the slight variation in time when generalization was achieved by participants following the introduction of Treatment II, and the presence of some generalized responding under Treatment I conditions.

Generalization occurred immediately following the first Treatment II training session for Liz and Mark. For Gary and Katie, generalization occurred following the second training session while four training sessions were required before generalized responding for Tony emerged. The slight differences in the number of stimulus exemplars needed for stimuli to develop desired discriminative properties may be a function of participant (i.e., learning history, idiographic responses to training procedures, discrimination abilities, attending, memory, and cognitive functions), stimulus (i.e., type used in training), and/or other environmental (e.g., receptiveness of the target environment for setting the occasion for, and reinforcing, play) variables. For Tony, his resistance to cooperate in the training sessions immediately following the introduction of Treatment II conditions was a likely contributor to the protracted emergence of generalized responding relative to the other participants. Tony had a history of difficulty adjusting to changes in routine, which included the introduction of new playmates. His response to the introduction of Treatment II was consistent with this history.

As the study progressed, children in Room 5 were becoming more skilled at organizing and sustaining play as a function of their social interactions with participants. Consequently, Room 5 had become an even

more "receptive" play environment for Tony, Gary, and Katie who, themselves, were becoming more "receptive" to play because of the social skills training that they were receiving under Treatment I conditions. As the data in Figure 1 suggest, this may have contributed to the limited instances of generalized play that emerged for Tony and Gary well into their Treatment I phase, and the more frequent generalized play observed for Katie as displayed in Figure 2.

Anecdotally, when Katie was reintroduced to Room 5 at the start of baseline, she was frequently asked to play by untrained peers to which she refused save for one occasion. Under Treatment I conditions, the untrained peers' persistence began to pay off as Katie became more responsive to their advances. Under Treatment I conditions, however, she did little if any organizing of the play and would follow the lead of others only to leave and to go and play on her own following short periods of time. Under Treatment II conditions, Katie's pattern of play changed. She became active at organizing and maintaining social interactions with the other children, and this was more characteristic of the play of the other participants under the same training conditions. The exact reason(s) for this change in Katie's play following the introduction of Treatment II is (are) unknown. Perhaps, the introduction of a

trained peer and a teacher from Room 5 into training served to broaden the stimulus control over Katie's play behaviors, enabling generalization from the training to the target setting via external or internal (i.e., rules) stimulus control.

The present study demonstrated the efficacy of a combination of generalization programming strategies (Stokes & Osnes, 1989) based on operant principles, and additional practices specified by Chandler et al. (1992) in producing generalization of social interaction skills. Of particular importance is the success of these strategies with a hard-of-hearing preschool population in a highly relevant, unstructured, interactional setting. To date, there has been a paucity of generalization research with this population, and a general lack of "complete success" (Chandler et al., 1992) in programming generalization of trained skills.

Future research will be required to replicate the findings of the current study, to test the generality of the independent variables across other hard-of-hearing participants, disability groups, and relevant interactional settings, and to evaluate the maintenance of behavior change following withdrawal of treatment. The contributions of more cognitively-based strategies or rules on producing and maintaining generalized outcomes across developmental stages

is also worthy of investigation. As Chandler et al. (1992) indicate, further study is needed "to identify empirically a set of best practices to promote generalization of preschool children's behavior and to determine if these practices are consistent across children, target behaviors, environments, agents, and behavior-change strategies" (p. 427). The present study represents an initial step in this direction.

References

- Antia, S.D., & Kreimeyer, K. (1988). Maintenance of positive peer interaction in preschool hearing-impaired children. Volta Review, Dec, 325-337.
- Antia, S.D., Kreimeyer, K.H. (1987). The effect of social skill training on the peer interaction of preschool hearing-impaired children. Journal of the Division for Early Childhood, 11(3), 206-216.
- Aquarium® (1979). Jumbo®. Hausemann en Hotte nv. Amsterdam: Holland.
- Barclay, J.R. (1966). Sociometric choices and teacher ratings as predictors of school dropouts. Journal of School Psychology, 4, 40-44.
- Barnes, K.E. (1971). Preschool play norms: A replication. Developmental Psychology, 5(1), 99-103.
- Barton, E.J., & Osborne, J. (1978). The development of classroom sharing by a teacher using positive practice. Behavior Modification, 2, 231-250.
- Billingsley, F., White, O.R., & Munson, R. (1980). Procedural reliability: A rationale and an example. Behavioral Assessment, 2, 229-241.
- Buswell, J.J. (1953). The relationship between social structure of the classroom and academic success of pupils. Journal of Experimental Education, 22, 37-52.

Candy Land® Bingo: A Color Recognition Game. (1978). Springfield, MA:

Milton Bradley Co.

Chandler, K., Lubeck, R C., & Fowler, S.A. (1992). Generalization and maintenance of preschool children's social skills: A critical review. Journal of Applied Behavior Analysis, 25, 415-428.

Cowen, E.L., Pederson, A., Babigian, H., Izzo, L., & Trost, M.A. (1973). Long-term follow-up of early detected vulnerable children. Journal of Consulting and Clinical Psychology, 41, 438-446.

Ducharme, D.E., & Holborn, S.W. (1994). Training and generalization of social skills in hard of hearing preschool children. Manuscript submitted for publication.

Edelstein, B. (1989). Generalization: Terminological, methodological and conceptual issues. Behavior Therapy, 20, 311-324.

Esposito, B.G., & Koorland, M.A. (1989). Play behavior of hearing impaired children: Integrated and segregated settings. Exceptional Children, 55(5), 412-419.

Forehand, R., Cheney, T., & Yoder, P. (1974). Parent behavior training: Effects on the non-compliance of a deaf child. Journal of Behavior Therapy and Experimental Psychiatry, 5, 281-283.

- Fox, J.J., & McEvoy, M.A. (1993). Assessing and enhancing generalization and social validity of social-skills intervention with children and adolescents. Behavior Modification, 17(3), 339-366.
- Gresham, F.M., & Lemanek, K.L. (1984). Assessment and classification of children's' social skills: A review of methods and issues. School Psychology Review, 13, 291 - 301.
- Johnston, J.M. (1979). On the relation between generalization and generality. The Behavior Analyst, 2, 1-6.
- Kazdin, A.E. (1982). Single-case research designs: Methods for clinical and applied settings. New York: Oxford University Press.
- Keller, F.S., & Schoenfeld, W.N. (1950). Principles of Psychology. New York: Appleton-Century-Crofts.
- Kirby, K.C., & Bickel, W.K. (1988). Toward an explicit analysis of generalization: A stimulus control interpretation. The Behavior Analyst, 11, 115-129.
- Kreimeyer, K.H., & Antia, S.D. (1988). The development and generalization of social interaction skills in preschool hearing-impaired children. The Volta Review, 90(4), 219-231.

- Lemanek, K.L., & Gresham, F.M. (1984). Social skills training with a deaf adolescent: Implications for placement and programming. School Psychology Review, 13, 385-390.
- Lemanek, K.L., Williamson, D.A., Gresham, F.R., Jensen, B.J. (1986). Social skills training with hearing-impaired children and adolescents. Behavior Modification, 10 (1), 55-71.
- Levine, M.N. (1982). Leiter International Performance Scale. Chicago, Illinois: Stollting Co.
- Marble Tower. (1990). Kugel-Bahn. Karlsruhe, West Germany: Simex Richard Simm & Shone.
- Martin, G., & Pear, J. (1992). Behavior modification: What it is and how to do it (4th ed.). Englewood Cliffs, NJ: Prentice-Hall.
- McCauley, R.W., Bruininks, R.H., & Kennedy, P.K. (1976). Behavioral interactions of hearing impaired children in regular classrooms. The Journal of Special Education, 10(3), 277-284.
- Number Puzzles Game. (1989). Springfield MA: Milton Bradley Co.
- Odom, S.L., Hoyson, M., Jamieson, B., & Strain, P.S. (1985). Increasing handicapped preschoolers' peer social interactions: Cross setting and component analysis. Journal of Applied Behavior Analysis, 15, 477-492.

- Odom, S.L., & McConnell, S.R. (1985). A performance-based conceptualization of social competence of handicapped preschool children: Implications for assessment. Topics in Early Childhood Education, 4(4), 1-19.
- Original Memory Game. (1986). Springfield MA: Milton Bradley Co.
- Parten, M.B. (1932). Social participation among preschool children. Journal of Abnormal and Social Psychology, 27, 243-269.
- Photo-Object Beginner's Lotto[©] (LC 349). (1991). Lakeshore.
- Rasing, E.J., Connix, F. Duker, P.C., & Van Den Hurk, A.J. (1994). Acquisition and generalization of social behaviors in language-disabled deaf adolescents. Behavior Modification, 18(4), 411-442.
- Rasing, E.J., & Duker, P.C. (1992). Effects of a multifaceted training procedure on the acquisition and generalization of social behaviors in language-based deaf children. Journal of Applied Behavior Analysis, 25, 723-734.
- Roff, M., Sells, S.B., & Golden, M.M. (1972). Social adjustment and personality development in children. Minneapolis: University of Minnesota Press.

- Salmon, D. (1991). Development of stimulus classes as a function of training procedures and diversity of exemplars. Unpublished manuscript, University of Manitoba.
- Sesame Street Picture Hunt.® (1984). Springfield, MA: Milton Bradley Co.
- Sesame Street Simple Shapes.® (1984). Springfield, MA: Milton Bradley Co.
- Sidman, M. (1960). Tactics of scientific research: Evaluating experimental data in psychology. Boston: Authors Cooperative Inc., Publishers.
- Stokes, T.F., & Baer, D.M. (1977). An implicit technology of generalization. Journal of Applied Behavioral Analysis, 10, 349-367.
- Stokes, T.F., Baer, D.M., & Jackson, R.L. (1974). Programming the generalization of a greeting response in four retarded children. Journal of Applied Behavior Analysis, 7, 599-610.
- Stokes, T.F., & Osnes, P.G. (1989). An operant pursuit of generalization. Behavior Therapy, 20, 337-355.
- Tremblay, A., Strain, P.S., Hendrickson, R.S., & Shores, R.E. (1981). Social interactions of normal preschool children. Behavior Modification, 5(2), 237-253.

Vandell, D.L., & George, L.B. (1981). Social interaction in hearing and deaf preschoolers: Successes and failures in initiations. Child Development, 52, 627-635.

Wolf, N.M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. Journal of Applied Behavior Analysis, 11, 203-214.

APPENDIX A
PARENT/TEACHER QUESTIONNAIRE

Name: _____
Date: _____

() Parents
() Teacher

PART A

Please rate the following by circling the appropriate number.

1. How important do you feel it is for children to initiate/organize play with other children?

1 not at all important	2	3	4 important	5	6	7 very important
------------------------------	---	---	----------------	---	---	------------------------

2. How important do you feel it is for children to share and play cooperatively with other children?

1 not at all important	2	3	4 important	5	6	7 very important
------------------------------	---	---	----------------	---	---	------------------------

3. How important do you feel it is for children to help other children (e.g., if a child is having difficulty completing a puzzle; to help another child put toys away), or to teach another child how to draw something, use a computer, game etc.?

1 not at all important	2	3	4 important	5	6	7 very important
------------------------------	---	---	----------------	---	---	------------------------

PART B

Please order the following social behaviors from 1-11 with "1" being the most important and "11" the least important. Before ordering the ten social behaviors listed below, please review the list.

- ____ Following instructions
- ____ Helping/assisting others
- ____ Greeting other children
- ____ Praising other children
- ____ Sharing/cooperating
- ____ Asking for help/assistance
- ____ Initiating/organizing play with other children
- ____ Being a leader
- ____ Following the other children
- ____ Saying goodbye to others
- ____ Playing quietly alone, or near other children

PART C

Please answer yes or no to the following:

1. Do you feel that it is important for children to receive training in the social skills area?

____ Yes ____ No

2. Do you feel that it is worthwhile for your child/children to participate in the research project?

____ Yes ____ No

3. Do you feel your child/children will benefit from participating in the research project?

Yes No

PART D

1. Please list below any social behaviors not listed above that you feel are important for your child/children to learn.

APPENDIX B
EXAM: TEACHING PROCEDURES

Part A

1. How will you set the stage for each free play period?
Give an example:

2. Indicate and briefly explain the three different kinds of social interaction routines that you and the child will participate in:

i) _____

ii) _____

iii) _____

During the 3 different types of social interaction routines with the children, you will be required to model the required procedures and interaction skills. Briefly explain what you will be modelling during:

Shared product routines: _____

Cooperative game routines: _____

Role play routines: _____

4. Explain briefly the prompting system to be used with the child (ie. the kinds of prompts, when you would use them and how often).

5. Briefly explain the praise/reinforcement system:

i) How will you reinforce the child? _____

ii) For what will you reinforce the child? _____

- iii) When will you reinforce the child? _____

APPENDIX C
PARENT QUESTIONNAIRE

COMMUNITY

(1) During your son's/daughter's participation in the social skills study, please check one or more of those social behaviors that you did not see any changes in his/her social interactions with:

A) you

- caring for others
- following instructions
- initiating play or conversation
- aggression towards others
- sharing/cooperating
- respect for others
- helping/assisting
- other (please specify below)

Comments: _____

B) his/her brothers/sisters

- caring for others
- following instructions
- initiating play or conversation
- aggression towards others
- sharing/cooperating
- respect for others
- helping/assisting
- other (please specify below)
- not applicable

Comments: _____

(2) During your son's/daughter's participation in the social skills study, please check one or more of those social behaviors that you saw positive changes in his/her social interactions with:

A) **you**

- caring for others
- following instructions
- initiating play or conversation
- aggression towards others
- sharing/cooperating
- respect for others
- helping/assisting
- other (please specify below)

Comments: _____

B) **his/her brothers/sisters**

- caring for others
- following instructions
- initiating play or conversation
- aggression towards others
- sharing/cooperating
- respect for others
- helping/assisting
- other (please specify below)
- not applicable

Comments: _____

(3) During your son's/daughter's participation in the social skills study, please check one or more of those social behaviors that you saw negative changes in his/her social interactions with:

A) **you**

- caring for others
- following instructions
- initiating play or conversation
- aggression towards others
- sharing/cooperating
- respect for others
- helping/assisting
- other (please specify below)

Comments: _____

B) **his/her brothers/sisters**

- caring for others
- following instructions
- initiating play or conversation
- aggression towards others
- sharing/cooperating
- respect for others
- helping/assisting
- other (please specify below)
- not applicable

Comments: _____

- (4) If you saw negative changes (noted in Question #3), are they still present today? Please circle one of the below:

YES **NO** **NOT APPLICABLE**

Comments: _____

- (5) If you noted positive changes in Question #2, are they still present today? Please circle one of the below:

YES NO NOT APPLICABLE

Comments: _____

- (6) While participating in the study, what type of change, if any, did you notice in your son's/daughter's social interactions with children in the neighborhood and/or with his/her classmates. Please check as many that applies to your situation:

- no change
 - positive change
 - negative change
 - do not know

If you checked "no change" please answer Question #7. If you checked "positive change", please answer Question #8. If you checked "negative change", please answer Question #9. If you checked "do not know", please proceed to Question #10.

(7) Please check as many that applies to your situation where you saw no changes in your child's social skills.

- caring for other
- following instructions
- initiating conversation/play
- aggression towards others
- sharing/cooperating
- respect for others
- helping/assisting
- other (please specify below)

Comments: _____

(8) Please check as many that applies to your situation where you saw positive changes in your child's social skills

- caring for other
- following instructions
- initiating conversation/play
- aggression towards others
- sharing/cooperating
- respect for others
- helping/assisting
- other (please specify below)

Comments: _____

(9) Please check as many that applies to your situation where you saw negative changes in your child's social skills.

- caring for other
- following instructions
- initiating conversation/play
- aggression towards others
- sharing/cooperating
- respect for others
- helping/assisting
- other (please specify below)

Comments: _____

(10) If there were any other changes, positive or negative, that occurred while your daughter/son participated in the study please use the space below to comment on these.

Society for Manitobans with Disabilities

(11) At the start of the study, initiating play, sharing/cooperating, and assisting/helping were selected by parents as the three most important social behaviors to reach their children. In your opinion, would these three social behaviors remain the most important to teach your child? Please circle one of the following:

YES

NO

Comments: _____

(12) After reviewing a number of social skills training sessions that your daughter/son participated in please rate, on the following scale, how satisfied you are with how these skills were taught.

1	2	3	4	5	6	7
not at all satisfied			satisfied			very satisfied

Comments: _____

(13) How satisfied are you with the outcome of the training to get your daughter/son to play with other children in his/her classroom?

1	2	3	4	5	6	7
not at all satisfied			satisfied			very satisfied

Comments: _____

(14) How satisfied are you with the outcome of the training to get your daughter/son to play with other children in Room 5?

1	2	3	4	5	6	7
not at all satisfied			satisfied			very satisfied

Comments: _____

GENERAL

(15) Do you feel that your son/daughter benefitted from participating in the study. Please circle one of the following and provide comments in the space provided?

YES NO

Comments: _____

(16) Please indicate below how much you feel the social skills training procedures were responsible for the positive changes that you saw in your child:

A) at home

1	2	3	4	5	6	7
very responsible			responsible			not at all responsible

Not Applicable

B) in the neighborhood

1	2	3	4	5	6	7
very responsible			responsible			not at all responsible

Not Applicable

C) at SMD

1	2	3	4	5	6	7
very responsible			responsible			not at all responsible

Not Applicable

D) in Kindergarten

1	2	3	4	5	6	7
very responsible			responsible			not at all responsible

Not Applicable

Comments: _____

(17) Please comment on what other factors that you believe were responsible for any positive or negative changes that you saw in your child's social behavior during his/her participation in the study.

Comments: _____

(18) Would you have your child participate in a similar study if offered in the future? Please circle one of the following and provide comments?

YES

NO

Comments: _____

(19) Overall, how satisfied are you with the outcome of the study?

1	2	3	4	5	6	7
not at all			satisfied			very
satisfied						satisfied

Comments: _____

(20) Please provide any additional comments that you feel are important about the study.

Comments: _____

THANK YOU FOR PERMITTING YOUR DAUGHTER/SON TO
PARTICIPATE IN THE STUDY, AND FOR COMPLETING THIS
QUESTIONNAIRE.

APPENDIX D
TEACHER QUESTIONNAIRE

(1) Prior to the start of the study, initiating, sharing/cooperating, and assisting were chosen as the three most important social skills to teach the children participating in the social skills research study. Do you continue to support these behaviors as the behaviors of choice when teaching social skills to preschool children?

Please circle one of the following.

YES

NO

Comments: _____

If you circled "NO", please indicate in the space below those social behaviors that you believe to be more important to teach preschool children.

(2) On the following scale, how effective would you rate the social skills training procedure for teaching:

Play Organizers

1	2	3	4	5	6	7
not at all effective			effective			very effective

Sharing/Cooperating

1	2	3	4	5	6	7
not at all effective			effective			very effective

Assisting

1	2	3	4	5	6	7
not at all effective			effective			very effective

Comments: _____

(3) On the following scale, how effective would you rate the generalization procedures in promoting the trained social skills to occur in the Language Classroom with untrained peers?

1	2	3	4	5	6	7
not at all effective			effective			very effective

Comments: _____

(4) On the following scale, indicate the extent to which you now incorporate aspects of the social skills training procedures in your every day training of social skills in your classroom with other students.

Please comment on your answer.

(5) On the following scale how effective overall, would you rate the research project on the training and generalization of social skills?

Comments: _____

(6) Did you observe any benefits for the trained peers for participating in the study? Please circle one of the following and elaborate on your answer in the space provided.

YES

NO

Programming
90

(7) Did you observe any benefits for the untrained peers as a result of the study? Please circle one of the following and elaborate on your answer in the space provided.

YES

NO

(8) Are the changes, whether negative or positive, in the social skills that the participants demonstrated during the conduct of the study still present? Please circle one of the following.

YES

NO

(9) What do you see as the most significant benefit to this type of research? Please respond in the space provided.

(10) What do you see as the most significant drawback to this type of research? Please respond in the space provided.

(11) Would you participate in a similar future study? Please circle one of the following and elaborate on your answer in the space provided.

YES

NO

If you answered "NO" to Question #10, what changes would need to be made to have you participate in another social skills research project? Please respond in the space provided.

(13) In your opinion what other factors, if any, influenced either positive or negative changes in the children's social skills during their participation in the study aside from the social skills training procedures? Please comment.

(14) Please provide any additional comments that you feel are relevant about the study.

THANK YOU FOR YOUR PARTICIPATION IN THE RESEARCH
PROJECT AND FOR COMPLETING THIS QUESTIONNAIRE.

APPENDIX E

SUMMARY OF SOCIAL VALIDATION MEASURES

Target behaviours

Of those who responded to the question on the selection of the target behaviors, all continued to support play organizing, sharing and cooperating, and assisting as the behaviors of choice to incorporate into social-skills training with this population.

Perceived effectiveness of treatment procedures

On a scale of 1 to 7, with 1 representing not at all effective, 4 representing effective, and 7 representing very effective, the range of scores and the mean response rates provided by the teachers on their perceived effectiveness of the training procedures for training play organizing, sharing and cooperating, and assisting were 5 to 7 (mean 6.25), 6 to 7 (mean 6.5), and 4 to 6 (mean 5) respectively. On a similar question, parents were asked how much they felt that the social-skills training procedures were responsible for the positive changes observed in their child at SMDI. On a 7-point scale, with 1 representing very responsible, 4 representing responsible, and 7 not at all responsible, parents' responses ranged from 2 to 6 (one 2, two 3's, and one 6) with a mean response rate of 3.25. It is hypothesized that the respondent who

indicated "6" on their form did so in error. In Appendix C, Question 16, the "favorableness" of the anchor ratings are reversed (i.e., where "1" represents a good rating and "7" a less favorable rating) relative to the anchor ratings for the previous questions (i.e., where the higher the anchor number the more favorable the response). The more favorable responses that this particular respondent gave to Questions 13 and 14 lend support this hypothesis. As the respondents anonymity were kept, the particular respondent's answer to this question could not be clarified.

The teachers' perceived effectiveness of the training procedures for promoting generalization from Classroom 1 to Classroom 5 was evaluated using the same 7-point scale with 1 representing not at all effective, 4 representing effective, and 7 representing very effective. The responses ranged from 5 to 6 with a mean response rate of 5.5. Parents were also asked, on a scale of 1 to 7 (1 representing not at all satisfied, 4 representing satisfied, and 7 being very satisfied), how satisfied they were with the outcome of the training procedures to get their child to play with others during the training session, and with other children (i.e., the untrained peers) in the generalization setting. Responses ranged from 5 to 7 with mean response rates of 6.3 and 6 respectively.

Regarding their satisfaction (i.e., on a scale of 1 to 7, with 1 representing not at all satisfied, 4 representing satisfied, and 7 very satisfied) with how all three social skills were taught, parents' responses (after reviewing the videotape on their child) ranged from 5 to 6 with a mean rate of 5.5.

Generalization in the community

Parents responded to a number of questions on whether changes in the social behavior of their child were observed with themselves, siblings, neighbourhood friends and classmates while their child participated in the study. While no parents witnessed negative changes, all parents experienced positive changes with their child and observed improvements in the interactions between their child and a peer in at least one of the target behaviors at home. Improvements in related behaviors (eg. caring for others, following direction) not directly targeted in training were also noted. Two sets of parents saw changes in multiple behaviors with one set of parents commenting on the significant changes that had occurred in their child's ability to organize play and to select peers with whom to play. Three sets of parents indicated that the changes observed had been maintained at the time of completing the questionnaire. As only one subject had siblings, and for this subject his or her siblings were either much older or much younger than him or her, data are not

available on observed changes in interactions between the subjects and brothers and sisters.

Perceived benefits to participation

Teachers unanimously agreed as to the benefits accrued by the subjects through their participation in the study. Regarding the trained and untrained peers, teachers also saw benefits for them as well. For example, the trained peers saw their participation in the training sessions in Classroom 1 as a special "privilege", and the teachers reported that they too benefitted from additional training in social skills. Improvement in a number of the untrained peers' (from Classroom 5) social behavior was observed as well, and this was deemed to be a function of the subjects' interaction with them during generalization probes, and an increase in play between the untrained and trained (i.e., trained peers from Room 5) peers. Teachers also indicated benefits for themselves. Specifically, they valued learning social skills training procedures. When asked to indicate the extent to which they incorporate aspects of the training procedures into their every day training of social skills following the completion of the study, the teachers, on a scale of 1 to 7 (with 1 representing not at all, 4 representing sometimes, and 7 representing to a large extent) gave a range in response from 5 to 6 with a mean response rate

of 5.5.

Overall satisfaction with study

When asked to rate, on a scale of 1 to 7 (with 1 representing not at all effective, 4 representing effective, and 7 representing very effective), their overall satisfaction with the effects of the research on the training and generalization of social skills, teachers' responses ranged from 5.5 to 7 with a mean response rate of 6.4. Parents, when asked the same question, rated their overall satisfaction with the outcome of the study to fall between 5 to 7 with a mean response rate of 6.

Drawbacks identified

Teachers identified the time commitment required to run training sessions and the disruption to classroom activities as the biggest drawbacks to the current study. With respect to the latter concern, the structure of the training was in conflict with the teachers' philosophy of child-directed play during the free-play period. Training sessions were also, on occasion, in conflict with a trained or untrained peers' therapy or a planned structured play activity for the room. Despite their concerns, the teachers indicated that they would participate in a similar study if offered in the future. Parents also reported their support in having their child participate in a future social skills research

project.

Additional influences on play

Teachers identified maturation, interaction with neighbourhood peers, and parental guidance as variables (in addition to the training procedures) which may have been responsible for the positive changes observed in their child during participation in the study. Teachers listed maturation and individual (i.e., temperament and personality) as two potential sources of influence on the subjects' behavior in addition to the independent variables.