TEACHING BEHAVIORALLY HANDICAPPED PRESCHOOL CHILDREN TO SHARE

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We examined the effectiveness of Barton and Ascione's (1979) package for training sharing in a classroom setting with six behaviorally handicapped preschool children, four of whom were also developmentally delayed. Individual responses in sharing and not sharing were examined. Training consisted of initial instructions, modeling, and behavioral rehearsal, followed by teacher prompts and praise regarding sharing directly in a classroom free play period. Introduction of training in a multiple-baseline design across three pairs of children resulted in substantial increases in sharing for five of the six children. Results for negative interactions were less clear but suggested that concomitant decreases occurred for the same five children. The response analysis indicated that (a) individual components of sharing (offers, requests, and acceptances) all increased with training; (b) most children were more likely to initiate sharing through requests than through offers; (c) the proportion of sharing initiatives accepted by peers increased with training despite a much greater absolute number of initiatives; and (d) of the three negative behaviors (opposing play, taking without asking, and aggression) examined as incompatible with sharing, the most prevalent response was opposing other children's play. Individual differences in initial social repertoires and responsiveness to training were examined with respect to their implications for research and practice. Overall, the findings provide an encouraging indication of an intervention program for children with behavioral, social, and developmental handicaps.

DESCRIPTORS: sharing, social behavior, classroom behavior, preschool children

Play in early childhood means spending time with other children, exploring and manipulating objects, pretending, and acting out roles (Asher, 1978; Fein, 1978). One skill that is integral to interactive play is sharing, in which children offer and exchange toys, materials, and play opportunities with one another. Descriptive studies show that sharing occurs naturally in the play of normal preschool children and that sharing is very likely

to result in reciprocal positive social responses by peers (Charlesworth & Hartup, 1967; Tremblay, Strain, Hendrickson, & Shores, 1981). Conversely, children who do not share, "turn off" opportunities for positive social responses by others. Poor social relationships in childhood have been linked to social rejection by peers (Hartup, Glazer, & Charlesworth, 1967) and to serious problems in later adjustment (cf. Cowen, Pederson, Babigian, Izzo, & Trost, 1973; Robins, 1972; Roff, Sells, & Golden, 1972). If children with limited social repertoires could be explicitly taught to share, this training would increase their positive social contacts with others and might be instrumental in producing healthier, long-term social outcomes.

Several investigators have recently demonstrated effective techniques for training sharing in young children within classroom play activities. In the earliest studies, prompts and praise increased a variety of positive social behaviors, including sharing in children (Cooke & Apolloni, 1976; Strain,

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Reprints, copies of the observation code, interview procedures, and training script may be obtained from Karen S. Budd, Meyer Children's Rehabilitation Institute, University of Nebraska Medical Center, 42nd and Dewey, Omaha, Nebraska 68105.

Shores, & Kerr, 1976). Rogers-Warren and Baer (1976) used modeling and reinforcement of children's verbal self-reports to increase sharing and praising. By developing correspondence between children's reports of sharing and praising and their actual practice of the responses, prosocial behavior increased. Other procedures used effectively in training sharing include positive practice (Barton & Osborne, 1978) and delayed reinforcement (Fowler & Baer, 1981).

Barton and Ascione (1979) developed a comprehensive training package for teaching young children to share. This package consists of initial sharing training via teacher instructions, modeling, and behavioral rehearsal, followed by teacher prompts and praise directly in a free play activity. Based on the successful results of training with this package, subsequent studies analyzed the importance of adult presence (Barton, Olszewski, & Madsen, 1979), group composition (Barton & Bevirt, 1981), and individual components of training (Barton, 1981) on the development and generalization of sharing. These systematic replications confirmed the effectiveness of the Barton and Ascione (1979) training approach, especially when the entire package was used and when an adult was present in the setting in which generalization was assessed.

Although previous research has clarified that children as young as preschool age can learn to share, Barton (1982), in a comprehensive review of classroom sharing research, identified some important gaps in the existing literature. These include the dearth of information on quantitative and qualitative aspects of sharing in individual children, the lack of sharing studies in actual classroom settings, the absence of cost-benefit analyses of treatment approaches, and inadequate attention to the social validity of treatment effects. Regarding the first of these concerns, intervention studies (e.g., Cooke & Apolloni, 1976; Fowler & Baer, 1981) have typically assessed sharing as a single response class or have differentiated physical and verbal forms of sharing (e.g., Barton & Ascione, 1979; Barton & Osborne, 1978; Rogers-Warren & Baer, 1976). In one study, Rogers-Warren,

Warren, and Baer (1977) recorded separate components of sharing, such as offers to share, requests to share, and acceptances of peers' offers and requests; but these components were not presented or analyzed individually. Similarly, responses directly incompatible with sharing have not been individually examined within sharing studies. Often, findings regarding sharing are presented across small groups of children, thus precluding any individual analysis of effects. As Barton (in press) noted, microanalysis of response components related to sharing is needed to identify reasons for the failure of training in some cases and to tailor training to meet individual children's needs.

Regarding Barton's (1982) second concern with existing sharing research, only three of the sharing studies he reviewed were conducted in naturally occurring settings in which a regular teacher directed the class according to his or her typical daily schedule. Rather, most sharing research has been carried out in contrived classroom settings using experimenters as trainers. Of the three studies cited in actual classrooms, only one (Barton & Osborne, 1978) evaluated an intervention procedure for training sharing, whereas the other two were descriptive studies of normative peer interactions. Thus, the sharing research to date leaves many questions as to whether interventions are applicable within actual classroom conditions.

In addition to the concerns raised by Barton, we observed that few sharing studies have been conducted with children who evidence serious social deficits. With the exception of two studies involving behaviorally handicapped children (Hendrickson, Strain, Tremblay, & Shores, 1982; Strain et al., 1976) and one study with learning disabled children (Cooke & Apolloni, 1976), participants in sharing intervention studies have been described as normal preschoolers or kindergartners. To date, not one of the studies using Barton and Ascione's (1979) comprehensive training package has involved children with previously identified social deficits or developmental delays. If sharing training is considered appropriate for children of "normal" social development, it would seem necessary for socially deviant children. However, one might well

Table 1
Descriptive Information About Children

Name	Age at beginning of study	Race	Degree of delay		
			Cognitive	Language	Motor
Brent	4-7	Black	Mild	Mild	Mild
Timmy	4-7	Caucasian	Mild	Mild	None
Linda	7-3	Caucasian	Moderate	Moderate	Mild
Joel	4-7	Caucasian	None	None	None
Brian	4-0	Caucasian	Mild	Mild	None
Jerry	4-8	Caucasian/ Oriental	None	None	None
Clint	4-3	Black/ Caucasian	None	Mild	Mild
Peter	5-1	Caucasian	Moderate	Severe	Mild

question whether the successful findings of previous studies could be generalized to children with pervasive social deficits.

Our study was designed to replicate and extend examinations of Barton and Ascione's comprehensive package for training sharing and to address three specific limitations of previous research. First, a detailed response analysis was conducted of the individual components involved in sharing and not sharing. In this way, the functional effects of training on components of both positive and negative interactions could be identified for each child. Second, to provide an actual classroom environment for training, experimental observations occurred in an ongoing free play activity with the regular classroom teacher serving as trainer. Third, to test the effectiveness of Barton and Ascione's (1979) training package with socially deficient children, the participants in this study were behaviorally handicapped preschoolers with serious social deficits and, in several cases, with mild to moderate developmental delays. The overall purposes of the study were to facilitate sharing within the context of everyday classroom interactions and to analyze the effects of training on desirable and undesirable child responses.

METHOD

Children and Setting

The six children (five boys and one girl) who participated in this study were enrolled in the Pro-

grammed Activities for School Success Program (PASS), an ongoing remedial classroom program for behaviorally handicapped children. Two other boys were also enrolled in the program; because of time constraints, they did not receive training until the following school year, but data were collected on their behavior. The children served in PASS were between 4 and 7 years of age. Due to serious behavior problems that interfered with their performance in normal classrooms, they were referred for special treatment. Behavior problems included noncompliance with instructions, temper tantrums, and inattentiveness, as well as social deficits in expressing needs to others, cooperative play, and taking turns. Four of the six target children also exhibited mild to moderate cognitive, language, or motor delays that compounded their social problems. Table 1 provides more detailed information about individual children, compiled from standardized and informal test reports.

The study took place at the Meyer Children's Rehabilitation Institute, an outpatient clinic for children at the University of Nebraska Medical Center. The PASS remedial program was conducted in a classroom furnished with small tables, chairs, and a wide selection of educational and play materials. Class was held four mornings per week, 3 hours per day. The program used procedures of behavior analysis and learning theory in a structured educational setting to teach appropriate behavior. Children engaged in educational and rec-

reational activities under the direction of an experienced teacher and two aides.

This investigation took place during the free play period, which occurred for the first 30 minutes of the class day. During free play, three activity areas (art, manipulative, and dramatic play/building) operated simultaneously. Only the dramatic play/building area was involved in this research. Activities available in this area across class days included Bristle Blocks, Lego, Tinker Toys, cars with blocks to build roads, a doll house with furniture, a grocery store, and a kitchen. These activities were rotated across class days so that no activity occurred more than one time per week. During free play, the children were allowed to move between the three activity areas at their own pace; however, the teacher and aides prompted children to change areas on occasion to balance the number of children with available materials and assure that each child spent some time in each activity area each day.

Data Collection

Direct observations were conducted daily in the classroom free play period by having an observer watch one child for a 1-min period and record his or her behaviors in continuous 10-s intervals, then switch to a second child for a 1-min observation, and continue in the same pattern of alternation across subjects for the entire free play period. The order of observing children was determined daily at the start of the period by randomly ordering the children present in the dramatic play/building area. When a new child entered the activity area, he or she was observed during the next full minute. One-minute observations of children continued to rotate systematically across whichever children were present in the area. If a child left the area during the minute he or she was being observed, recording was suspended for the remainder of the minute and the intervals were excluded from data analysis. Observation continued as long as there were two or more children present in the dramatic play/building area. On days that a reliability observer was present, the child being observed during each minute was announced, using the child's first ini-

tial, by the primary observer at the start of each minute.

Seven child behaviors and four teacher behaviors were recorded on their occurrence in 10-s intervals. Each behavior could be recorded only once per interval. For child behaviors, one symbol was used to denote each behavior when it was displayed by the target child (the child being observed) and another symbol when it was displayed by a peer toward the target child. In addition, the number of children present in the area was noted at the start of each minute.

Defined child behaviors were: *Offers to share*, when a child verbally or physically indicated that a peer have, take, touch, manipulate, trade, or cooperatively use a material from the available free play activities or when a child invited a peer to join in a particular activity. *Requests to share*, when a child verbally asked or instructed a peer to give him or her a play material, allow cooperative use of a material, or let him or her join in a particular activity. In an offer, the target child had some control over the play materials or activity being offered, whereas in a request the materials were in control of the peer or neither child. *Responses to requests or offers*, either (a) acceptances (e.g., child allowed peer to have, take, touch, manipulate, trade, cooperatively use, or join in activity, responded affirmatively to a request or offer, or took the material offered) or (b) refusals (e.g., physical noncompliance to a peer's request or offer, or verbal denial). These definitions focused only on children's initiations and responses directly related to sharing; ongoing cooperative use of materials was not scored as sharing.

Defined negative child behaviors were as follows: *Taking without asking*, when the child took a toy or material that a peer was currently using without first requesting it. *Opposing play*, when the child indicated verbally that he or she did not want to play with other children or have other children join in the ongoing activity. *Aggression*, when the child made a motor attack that either made physical contact or came within 1 foot of a peer or his or her materials.

Defined teacher behaviors consisted of the following: *Positive attention for sharing*, when a

teacher acknowledged or indicated approval of a child's sharing, offering, requesting, trading, exchanging, passing materials or toys, or cooperative interaction. *Prompts to share*, when a teacher instructed, invited, or requested a child to engage in sharing behavior. *Other positive attention*, when a teacher acknowledged or indicated approval of any child behavior except sharing. *General attention*, when a child received any verbal attention that was not included within the other three teacher behaviors.

Reliability Procedures

The primary observer for this study was the first author. The reliability observer was trained by having him first collect data on two child behaviors. When acceptable levels of agreement (85%) were reached, the remaining child behaviors were added and, subsequently, the teacher behaviors. Training occurred directly in classroom free play periods across 8 days.

The reliability of recordings was assessed at least twice per condition for each child. Interobserver agreement was evaluated by comparing, interval by interval, the independent records of two observers who simultaneously recorded the behaviors. To be scored as an agreement, both observers had to record the same behavior in the same or the adjacent interval. A percentage of occurrence agreement was calculated for each response category by computing the number of occurrence agreements over the number of agreements plus disagreements and multiplying by 100.

Sharing Interview

Prior to and following the classroom training on sharing, the primary investigator interviewed the children individually in a structured analogue setting to determine what they could verbalize or demonstrate about sharing. The children were asked to describe what sharing was and how to share. If a child did not tell the experimenter how to share, he or she was given a container of Tinker Toys and the experimenter took three Tinker Toys, then the experimenter asked the child to show her how to share. The children were also asked how to get

toys when another child was using them. No feedback was given to the children regarding their answers in the structured interviews.

Experimental Design and Procedures

A multiple-baseline design across three pairs of children was used to evaluate the effects of training on the children's classroom behavior.

Baseline. Prior to any training, the children were allowed to interact with one another during free play with a minimum of adult attention. Typically, one teacher or aide was stationed in each of the three activity areas. The children participated freely in the three activities, except that a maximum of four children could be present in the dramatic play/building activity area at one time, and teachers encouraged children to play in that area on occasions when only one child was playing there. Although the overall level of teacher attention was kept low, teachers were told to provide positive attention periodically for general appropriate behavior and products of a child's behavior and to implement a contingent observation procedure (Porterfield, Herbert-Jackson, & Risley, 1976) for severely disruptive or dangerous behaviors. Contingent observation was not used for the negative behaviors measured in this study, with the exception of intense or prolonged aggressive acts (e.g., kicking a peer several times in a row or biting someone).

Training. The classroom procedures during free play remained identical to baseline except that (a) on 4 consecutive days, during the first 10 minutes of free play, two children at a time received sharing training, and (b) for all subsequent class days, children who had received training were provided prompts to share, praise for sharing, and correction of nonsharing behaviors directly in the classroom dramatic play/building activity. Contingent observation remained in effect for intense aggressive behaviors. The training sessions were conducted in a separate area of the classroom by the head teacher, using toys and materials found in the dramatic play/building activity area.

The training included a discussion of sharing by the teacher, modeling of sharing with the teacher

and each child, rehearsal of sharing behavior by the two children, and feedback about sharing from the teacher during rehearsal. The training package closely followed that of Barton and Ascione (1979) for training both verbal and physical sharing.

On the first day of training, the children were provided with a rationale for the importance of sharing, how to share, and, in contrast to the Barton and Ascione training package, what behaviors are not sharing. The children in this investigation engaged in a high rate of negative behaviors; thus the teacher considered it important to discourage these behaviors directly. For example, the teacher told the children, "We can share by giving other children things when they ask nicely for them. We can also share by asking for toys that other children have. It is not sharing to hit or push other children, take toys that they are playing with, or tell them they cannot play." Following the introductory discussion, the teacher selected one of the children to model the behaviors with her. The child model was offered materials by the teacher, and the teacher requested materials from the child. Any offers or requests to share and acceptances of offers or requests by the model were descriptively praised by the teacher. If the model did not share independently, the teacher prompted sharing behaviors.

On the second day of training, the teacher reviewed what sharing behavior was and how to share. The other child was then asked to practice sharing with the teacher as described above. Following this practice, the two children were asked to play together and share. The teacher praised and prompted offers, requests, and acceptances. Refusals to share were followed with a description of a more acceptable response (e.g., "Okay, you can play with the dog. Can I use the car?" or "No, I just got this. You can have it in a little while."). Any instances of taking without asking, opposing play, or aggression were interrupted, and the children were prompted in how to share appropriately. On the third and fourth days of training, the children practiced sharing for the 10-minute period in the same manner, with the teacher praising and prompting sharing behavior.

At the conclusion of each training session, the teacher reviewed sharing with the children. For example, "Now that you've had a chance to share and play together, remember it is very important to share with all the children in the classroom, not just each other. Sharing is asking another child for something, giving someone something, and using the same things together." The children were then told to return to the free play activity areas and play with the other children.

When the children returned to free play, the teachers praised them following any sharing behaviors (e.g., offers to share, requests to share, and acceptances of offers and requests) and prompted them to share following refusals to share, taking without asking, opposing play, and aggression. These comments were made as privately as possible to the trained children so as not to be overheard by the untrained children. If any untrained child displayed negative behaviors toward a trained child, the trained child was privately comforted by an adult and was told, for example, that the other child "has not learned to share or play nicely. You just keep playing nicely and sharing and maybe he or she will learn just by watching you."

RESULTS

Interobserver agreement levels across the study averaged 74% to 92% for individual behaviors, as shown in Table 2. Because of the low frequency of recorded responses, ranges of agreement varied across individual sessions; however, overall reliability levels were considered satisfactory.

Because of the low rates of defined behaviors and concomitant day-to-day variability of data for individual children, data were summarized after completion of the study into session blocks for graphic presentation. Most blocks are composed of data from four classroom sessions; however, some blocks contain data from fewer than four sessions because a child was absent on one day or there was an uneven number of days in the experimental condition.

Figure 1 displays levels of the children's sharing behaviors (offers, requests, and acceptances) and

Table 2

Ranges and Mean Reliability Percentages of Individual Behaviors Across all Experimental Conditions

Behavior	Ranges	Mean agreement (%)
Child behaviors		
Offers to share	0-100	92
Requests to share	50-100	82
Acceptances	0-100	87
Refusals	83-100	81
Taking without asking	0-100	74
Opposing play	0-100	81
Aggression	50-100	80
Teacher behaviors		
Positive attention for sharing	50-100	75
Prompts to share	80-100	92
Other positive attention	0-100	75
General attention	50-100	85

negative interactions (taking without asking, opposing play, and aggression) across the study. Data are presented for the six trained children as well as for the two children (Clint and Peter) who did not receive training during the study. An increase in sharing behaviors during the treatment phase is evident for five of the six trained children, with less clear effects for Jerry. A concomitant decrease in negative behaviors during treatment appears to have occurred for five of the six children, with no systematic change apparent for Jerry. The effect of training on Brent's negative interactions is obscured somewhat by the zero point in the last session block of baseline. However, he also displayed no positive sharing responses during this session block and thus provides no evidence of improvement in social interactions prior to training. Linda's negative interactions declined across baseline; however, her level stabilized during the final five session blocks of baseline and then dropped to one-half of its final baseline level during treatment. Overall, the trained children tripled the rate of sharing (from a mean of 4% to 14% of total intervals) and reduced negative interactions to one-third of their former level (from a mean of 6% to 2% of total intervals) following training, although amounts of change varied across children. Of the

Table 3

Mean Levels of Target Behaviors for Individual Children Across Experimental Conditions

Behavior	Brent	Timmy	Linda	Joel	Brian	Jerry	All
Number of intervals per 30 minutes							
Offers							
BL	2.8	1.3	.6	2.7	.5	3.8	1.9
TR	8.4	6.9	6.9	6.1	8.1	3.8	7.2
Requests							
BL	4.0	1.3	1.4	7.7	2.7	.3	2.8
TR	17.1	3.5	4.7	13.3	9.3	8.8	9.7
Acceptances							
BL	2.3	3.4	3.1	2.4	3.0	2.4	2.7
TR	4.6	11.5	5.6	8.2	10.5	11.3	7.7
Refusals							
BL	3.4	1.3	1.1	1.3	3.2	2.4	2.2
TR	1.9	2.8	1.7	5.1	1.2	7.5	2.7
Taking without asking							
BL	1.7	1.3	.8	.7	1.8	1.4	1.3
TR	.5	0	.4	1.0	0	0	.4
Opposing Play							
BL	8.5	12.7	19.1	5.7	3.2	7.0	9.0
TR	1.6	3.8	6.5	0	0	6.3	3.2
Aggression							
BL	1.7	0	.8	0	1.3	0	.6
TR	0	.4	0	0	0	0	.1
Percentage of total offers and requests							
Child acceptances of peer offers and requests							
BL	40	71	73	64	48	44	57
TR	71	79	76	62	90	60	70
Peer acceptances of child offers and requests							
BL	40	50	67	75	25	80	61
TR	66	82	77	65	43	70	68
Percentage of total scored interactions							
Sharing behaviors							
BL	37	30	19	62	40	37	36
TR	87	76	67	82	96	63	79
Negative interactions							
BL	49	63	77	31	40	49	53
TR	7	14	27	3	0	17	12

two children who did not receive training, Clint showed no systematic change in sharing behavior but a gradual reduction in negative interactions across the study. Peter displayed highly increased sharing during the final session block but no re-

Figure 1. Individual child levels of sharing and negative interactions as percentages of total intervals observed across 4-day session blocks. Dashed vertical lines indicate introduction of sharing training for successive pairs of children.

duction in negative behaviors across treatment for his peers.

To allow more detailed inspection of the effects of training on components of sharing and not sharing, mean levels of individual response categories for each trained child during baseline and treatment phases are presented in Table 3. Examination of the two forms of sharing initiatives showed that the average number of intervals that both offers and requests occurred per 30 minutes increased noticeably for five of the children following training. Jerry, however, showed an increase only in the number of intervals of requests. Both before and after training, most children were more likely to initiate sharing through requests to a peer than through offers.

With the increased level of sharing initiatives in treatment, the overall frequency of the children's acceptances of sharing initiatives rose substantially, and the frequency of refusals increased marginally. However, of greater importance is the proportion of sharing initiatives accepted versus refused by children. For five of the six children, the probability of accepting peers' sharing initiatives increased with training, climbing from a mean level across all children of 57% in baseline to 70% in treatment. Likewise, peers continued to accept sharing initiatives made by children at an overall level of 68% in treatment compared to 61% in baseline. Thus, the increased frequency of offers and requests did not adversely affect the children's likelihood of accepting sharing initiatives.

An examination of the children's negative interactions in Table 3 showed that opposing another child's play was the most frequent negative response in both baseline and treatment. Across the study, it accounted for 84% of the total negative responses; taking materials without asking accounted for 11%; and physical aggression, 5%. With few exceptions, levels of individual negative behaviors decreased for each child as a result of treatment.

Two summary measures of the effects of sharing training are displayed at the bottom of Table 3. In baseline, sharing behaviors (offers, requests, and acceptances) accounted for only 36% of the total

Table 4
Mean Percentage of Teacher Prompts and Praise for Sharing to Individual Children Across Experimental Conditions

Behavior	Brent	Timmy	Linda	Joel	Brian	Jerry	All
Percentage of total child behavior							
Offers and requests preceded by a prompt							
BL	0	0	0	0	0	7	1
TR	23	43	41	21	27	20	29
Offers and requests followed by positive attention							
BL	0	0	0	0	0	0	0
TR	54	67	67	79	80	80	64
Acceptances preceded by a prompt							
BL	0	0	0	0	0	0	0
TR	6	3	23	0	0	11	7
Acceptances followed by positive attention							
BL	0	0	0	0	0	0	0
TR	65	36	54	13	78	56	48

scored interactions across all children, whereas the proportion increased to 79% following training. Concurrently, negative interactions dropped from 53% to 12% of the total interactions. Refusals of sharing initiatives accounted for 11% of total interactions in baseline and 9% in treatment.

Examination of teacher prompts to share and praise for sharing verified that the teacher and aides implemented the free play procedures correctly. During the baseline phase, virtually no praise or prompts related to sharing were recorded. After training began, each trained child received prompts or praise for sharing an average of once per minute across the play period. Table 4 presents more detailed information regarding the relationship of teacher attention for sharing in the free play activity to the children's sharing behavior. Levels of teacher attention during treatment varied somewhat across children, but for all children there was a higher frequency of positive attention than prompts. Very few prompts were provided in treatment relating to a child's acceptance of an offer or request. Overall, this table indicates that the children spontaneously initiated a large proportion of sharing responses in free play and re-

ceived frequent positive feedback from teachers for their sharing behaviors.

The sharing interview conducted with each child prior to and following training showed that, in baseline, only one child was able to describe accurately any components of sharing. Following training, four of the children (Brent, Joel, Brian, and Jerry) provided a correct response with phrases such as "giving when someone asks" and "giving toys to people." When asked "How do you share?" only one child responded correctly prior to training, whereas five of the children described at least one component following training (e.g., "give it when someone asks" and "ask people for a toy.") When asked how to get a toy when another child has it, four of the children responded appropriately before training and five following training. Linda was the only child who did not respond correctly to any of the questions prior to or following training.

DISCUSSION

The present findings demonstrate that Barton and Ascione's (1979) sharing training package can be applied successfully with children who display serious behavior problems and social deficits. Following training, sharing behaviors increased and negative interactions decreased in five of the six children, including four children with mild to moderate cognitive, language, or motor impairments. Training was carried out by the regular classroom teacher in the context of ongoing classroom activities, thus extending the practical validity of this intervention package beyond contrived experimental settings.

The response analysis of individual behaviors involved in sharing and not sharing revealed some interesting patterns: (a) training increased the frequency of all measured components of sharing; (b) most children were more likely to initiate sharing through requests than through offers; (c) the proportion of sharing initiatives accepted by children increased with training, despite the fact that children initiated many more offers and requests to one another during the treatment phase; and (d) of three negative behaviors examined as incom-

patible with sharing, children were far more likely to oppose other children's play verbally than to take materials or aggress against others physically.

The generality of these findings is as yet unknown, because other studies have not examined the response components of sharing in the detail used in this research. A study by Warren, Rogers-Warren, and Baer (1976) assessed children's probability of accepting sharing offers as a function of the rate of share offers and found that offer rates of one to two per 5 minutes (equivalent to 6 to 12 per 30 minutes) yielded greater acceptance levels than higher offer rates. In the present research, children went from an overall average of less than two intervals of offers per 30 minutes to seven intervals of offers in the same time period, which fits within the range recommended by Warren et al. (1976).

The response analysis in the current study also allowed for examination of individual differences between children in initial social repertoires and responsiveness to treatment. The two children (Timmy and Linda) with the highest rates of negative interactions in baseline were also those with the lowest levels of sharing. Before training, negative behaviors accounted for 63% and 77%, respectively, of their total recorded interactions. These children rarely initiated sharing offers or requests in baseline, yet they accepted a high proportion of sharing initiatives to them by peers. These findings suggest that problems in initiating social interactions with peers may be a separate issue from those of responding to social initiatives of others. The intervention package in this study included training in both initiations and responses involved in sharing, but for some children training may be needed in only one of these dimensions.

Another individual difference between children may relate to the developmental status of the children. Joel and Jerry were functioning in the average to above average range, whereas the other four children displayed deficits in cognitive, language, or motor areas. Prior to training, the only sharing measure that systematically differentiated these two groups was that Joel and Jerry were noticeably more successful than other children at getting peers

to accept their sharing initiatives (75% and 80% success rates, respectively, compared to rates of 25% to 67% for their peers). Considering that Joel's and Jerry's verbal and conceptual skills were above those of other children, this difference is not surprising. After treatment was introduced, peers' acceptance of Joel's and Jerry's initiatives stayed fairly high whereas the other children's success rates increased, so the difference disappeared. The one systematic difference in Joel's and Jerry's behaviors following training compared to their peers was that they both showed a greater increase in rates of refusing peers' sharing initiatives. Joel increased from an average of 1.3 intervals of refusals per 30 minutes in baseline to 5.1 in treatment, and Jerry increased from 2.4 to 7.5 intervals of refusals per 30 minutes in the two conditions, whereas their peers averaged 2.3 intervals of refusals in baseline and 1.9 in treatment. This increase in refusals by Joel and Jerry was neither expected nor desired. According to teacher reports, their refusals following training were mainly in response to requests where they would state, "No, I just got it; you can have it in a little while." Sometimes this response was appropriate, but on other occasions it appeared to be a convenient means of retaining access to play materials. It should be noted that, in training, children were taught how to refuse politely when they had just obtained a material, yet the recording system scored all refusals similarly and thus did not differentiate their form or appropriateness. Future research could provide a more detailed analysis of children's refusals in sharing interactions.

The sharing training package used in this research included initial training via instructions, modeling, and behavioral rehearsal as well as teacher prompts and praise directly in free play. Barton's (1981) component analysis of the training package shows that behavioral rehearsal and in-session teacher attention for sharing produced the most substantial changes when added sequentially. Although the current study did not investigate individual aspects of training, the teacher and experimenters informally concurred that prompts and praise directly in free play were important in get-

ting the children to display trained behaviors outside the initial training sessions. In the present research, teacher attention regarding sharing occurred an average of once per minute for each child following training, whereas Barton and Ascione (1979) provided attention approximately every 2 minutes. At either level of teacher attention, the training package requires a vigilant and attentive teaching staff to provide prompts and praise related to sharing. In the future, it seems worthwhile to examine the amount of teacher attention needed to sustain sharing as well as alternative strategies for maintaining the effects of training that entail less teacher time, to enhance the cost-effectiveness of treatment. The social value of training on children's daily interactions with peers also deserves investigation.

Generalization of training effects was not formally measured in this study. However, informal support for the beneficial effects of training was provided on a written 21-item behavioral checklist filled out periodically by PASS classroom staff and by the children's teachers in the year following enrollment in PASS. The checklist (the PASS Behavior Assessment) contained an item that read, "Is the child selfish in his or her interactions with others (e.g., refusing to share things or refusing to play with other children)?" Teachers rated the children on a 5-point scale from 1 (very often selfish) to 5 (not at all selfish). The children's ratings in PASS averaged 2.9 before treatment and 3.6 after treatment, and averaged 3.4 during a 1-year follow-up period. Five of the six children were rated as less selfish following training, and four of the children continued to receive favorable ratings in follow-up. These ratings provide an indication of some improvement in most of the children's sharing patterns correlated with training. Obviously, more systematic study of the generalized impact of training is needed.

In conclusion, we demonstrated the effectiveness of Barton and Ascione's package for training sharing with behaviorally handicapped and developmentally delayed children. The findings provide an encouraging indication of an intervention program for children with deviant social repertoires that can

be implemented in a classroom environment. The program also provides an observational tool for more sophisticated response analysis of the components involved in sharing with preschoolers.

REFERENCES

- Asher, S. R. (1978). Children's peer relations. In M. E. Lamb (Ed.), *Social and personality development* (pp. 91-113). New York: Holt, Rinehart and Winston.
- Barton, E. J. (1981). Developing sharing: An analysis of modeling and other behavioral techniques. *Behavior Modification*, 5, 386-398.
- Barton, E. J. (1982). Classroom sharing: A critical analysis of assessment, facilitation, and generalization procedures. In M. Hersen, R. E. Eisler, & P. M. Miller (Eds.), *Progress in behavior modification*: Vol. 13 (pp. 1-50). New York: Academic Press.
- Barton, E. J., & Ascione, F. R. (1979). Sharing in preschool children: Facilitation, stimulus generalization, response generalization, and maintenance. *Journal of Applied Behavior Analysis*, 12, 417-430.
- Barton, E. J., & Bevirt, J. (1981). Generalization of sharing across groups: Assessment of group composition with preschool children. *Behavior Modification*, 5, 503-522.
- Barton, E. J., Olszewski, M. J., & Madsen, J. J. (1979). The effects of adult presence on the prosocial behavior of preschool children. *Child Behavior Therapy*, 1, 271-286.
- Barton, E. J., & Osborne, J. G. (1978). The development of classroom sharing by a teacher using positive practice. *Behavior Modification*, 2, 231-250.
- Charlesworth, R., & Hartup, W. W. (1967). Positive social reinforcement in the nursery school peer group. *Child Development*, 38, 993-1002.
- Cooke, T. P., & Apolloni, T. (1976). Developing positive social-emotional behaviors: A study of training and generalization effects. *Journal of Applied Behavior Analysis*, 9, 65-78.
- Cowen, E. L., Pederson, A., Babigian, H., Izzo, L. D., & Trost, M. A. (1973). Long-term follow-up of early detected vulnerable children. *Journal of Consulting and Clinical Psychology*, 41, 438-446.
- Fein, G. G. (1978). Play revisited. In M. E. Lamb (Ed.), *Social and personality development* (pp. 70-90). New York: Holt, Rinehart and Winston.
- Fowler, S. A., & Baer, D. M. (1981). "Do I have to be good all day?" The timing of delayed reinforcement as a factor in generalization. *Journal of Applied Behavior Analysis*, 14, 13-24.
- Hartup, W. W., Glazer, J. A., & Charlesworth, R. (1967). Peer reinforcement and sociometric status. *Child Development*, 38, 1017-1024.
- Hendrickson, J. M., Strain, P. S., Tremblay, A., & Shores, R. E. (1982). Interactions of behaviorally handicapped children: Functional effects of peer social initiations. *Behavior Modification*, 6, 323-353.
- Porterfield, J. K., Herbert-Jackson, E., & Risley, T. R. (1976). Contingent observation: An effective and acceptable procedure for reducing disruptive behavior of young children in a group setting. *Journal of Applied Behavior Analysis*, 9, 55-64.
- Robins, L. N. (1972). Follow-up studies of behavior disorders in children. In H. C. Quay & J. S. Werry (Eds.), *Psychopathological disorders of childhood* (pp. 414-450). New York: John Wiley.
- Roff, M., Sells, S. B., & Golden, M. M. (1972). *Social adjustment and personality in children*. Minneapolis: University of Minnesota Press.
- Rogers-Warren, A., & Baer, D. M. (1976). Correspondence between saying and doing: Teaching children to share and praise. *Journal of Applied Behavior Analysis*, 9, 335-354.
- Rogers-Warren, A., Warren, S. F., & Baer, D. M. (1977). A component analysis: Modeling, self-reporting, and reinforcement of self-reporting in the development of sharing. *Behavior Modification*, 1, 307-322.
- Strain, P. S., Shores, R. E., & Kerr, M. M. (1976). An experimental analysis of "spillover" effects on the social interaction of behaviorally handicapped preschool children. *Journal of Applied Behavior Analysis*, 9, 31-40.
- Tremblay, A., Strain, P. S., Hendrickson, J. M., & Shores, R. E. (1981). Social interactions of normal preschool children. *Behavior Modification*, 5, 237-253.
- Warren, S. F., Rogers-Warren, A., & Baer, D. M. (1976). The role of offer rates in controlling sharing by young children. *Journal of Applied Behavior Analysis*, 9, 491-497.

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