*EFFECTS OF PEER SOCIAL INITIATIONS ON THE
BEHAVIOR OF WITHDRAWN PRESCHOOL CHILDREN¹*

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COLLEGE, AND EARLY INTERVENTION EXPANSION PROJECT

Social approach to peers was evaluated as an intervention for isolate preschoolers. During baseline, confederate peers made few social approaches to the target subjects. Confederates greatly increased their rate of social approaches during the first intervention, decreased social approaches during a second baseline, and increased social approaches again in a second intervention phase. Increases in confederate social initiations immediately increased the frequency of subjects' positive social behavior. Additionally, five of six subjects showed an increase in their own positive social initiations during intervention periods. The results suggest that: (a) peers may be programmed to increase the positive social behaviors of their isolate classmates, and (b) remediating social deficits requires assessment and intervention specifically tailored to the individual child.

DESCRIPTORS: social interaction, isolate behavior, social initiation, modelling, vicarious reinforcement, peers, confederates, preschool children

In recent years, an increasing number of behavior-modification studies have investigated the function of both primary and secondary reinforcers on children's positive social behavior (*e.g.*, Buell, Stoddard, Harris, and Baer, 1968; Hart, Reynolds, Baer, Brawley, and Harris, 1968; Kirby and Toler, 1970; Wahler, 1967; Whitman, Mercurio, and Caponigri, 1970). These studies have demonstrated that positive social behavior in isolate children can be developed, maintained, terminated, and re-instated by the systematic manipulation of adult- and peer-mediated reinforcement. Still other research has shown that the social responding of isolate children can be increased by exposure to appropriate behavior models (*e.g.*, O'Connor, 1969, 1972).

Two studies, Strain and Timm (1974) and Strain, Shores, and Kerr (1976) also suggest that the delivery of adult attention for positive social behavior may be accompanied by an increase in the amount of positive behavior emitted by target children and by peers who were not rewarded

directly. This "spillover" of treatment effect has been explained in the operant literature as resulting solely from the operation of vicarious reinforcement, a process that includes components of reinforcement and modelling (see Kazdin, 1973 for a thorough review of this literature). There are, however, two factors that limit the adequacy of vicarious reinforcement as an explanation of social behavior change, particularly among children severely handicapped behaviorally. First, for vicarious reinforcement to obtain, the nonrewarded peers must possess, to some extent, a generalized imitative repertoire (Strain *et al.*, 1976). Second, as Baer and Sherman (1964) suggested, the consequences delivered to target children must have a history of reinforcing effects on children not rewarded directly if the behavior of the target subjects is to be imitated. For many socially isolate children with limited imitative skills, these two preconditions are not likely to be present.

Another possible explanation of the "spillover" phenomenon related to social behavior change is that social stimuli may operate to set the occasion for social responding by the recipient of these events. Recent observational studies of infant-caregiver (Brazelton, Koslowski, and

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Main, 1974; Stern, 1971), adolescent-parent (Patterson and Reid, 1967), and adult-adult interaction (Kendon, 1967; Ray, Note 1; Rosenfeld, 1967) indicate a synchrony or reciprocity to social interaction, in which the individual responses of interactants tend to set the occasion for predictable behaviors from their partner. To date, the results of these correlational studies and other conceptual writings (Bell, 1968; 1974) have not been applied in efforts to increase the social behavior of isolate children. Thus, the intent of the present study was to evaluate the setting effect of peer-delivered social stimuli on the social behavior of isolate preschool children with limited imitative skills.

METHOD

Subjects

Six behaviorally handicapped preschool boys, ranging from 39 to 53 months of age, were enrolled in a private treatment center in suburban Washington, D.C. Subjects, grouped in two triads, were selected on the basis of five days of prebaseline observations that suggested that they rarely engaged in positive interaction with peers. The prebaseline observations were made by the observers used in the study, who employed the observational system and procedures described below. In addition to their social deficit, the subjects were also language delayed, and each boy was observed to engage in frequent tantrums. Stanford-Binet (Form L-M) IQ scores on the subjects were as follows: Mark, 49; Ted, 30; Al, 25; Tommy, 58; Dicky, 43; Steve, 44. The actual membership of the two triads was determined randomly.

Setting

The study took place in a 7.5- by 12.0-m playroom equipped with a large assortment of manipulative toys, dress-up clothes, and gross-motor equipment. The dimensions of the playroom and the materials included were identical to those in each subject's classroom. A one-way mirror and series of overhead microphones provided com-

plete visual and auditory access to the children at all times.

General Procedures

On each experimental day, the two triads were brought successively from their classrooms to the playroom for a 20-min session. Each day, the boys were instructed by an accompanying teacher that this was a time to play together with friends. The order in which the triads were brought into the playroom was alternated across all experimental days.

Behavioral Measures

An observational system similar to that employed by Strain *et al.* (1976) to measure continuous dyadic interactions was used. The behavior code included two general classes of interactive behavior, motor-gestural and vocal-verbal, along with their positive and negative topographic features. Specific operational definitions of positive and negative motor-gestural and vocal-verbal behaviors are contained in Strain *et al.* (1976). All motor-gestural and vocal-verbal behaviors were also coded as to whether they occurred (temporally) as initiated or responded events in an interactive sequence. Initiated behaviors included all motor-gestural and vocal-verbal behaviors that were emitted 3 sec before or after another child's motor-gestural or vocal-verbal behavior (Strain and Timm, 1974). Responded behaviors included all motor-gestural and vocal-verbal behaviors that were emitted within 3 sec following another child's motor-gestural or vocal-verbal behavior.

Two categories of teacher behavior, prompting and reinforcement, were also recorded. These behavior categories are operationally defined in Strain *et al.* (1976).

Observation Procedures

Social behaviors of each subject and confederate were recorded for six consecutive minutes (18 total minutes of observation). The order in which the subjects were observed was counter-balanced across experimental days. Interactions

occurring in the playroom that did not involve one of the subjects were not recorded. Recording began 1 min after the children entered the playroom. Entries of social behaviors were made by trained observers using coded symbols and a prepared record sheet (see Figure 1, Strain and Timm, 1974). The behaviors were recorded in continuous fashion. Each social behavior observed was entered as having been emitted by either of the subjects (S_1 , S_2 , S_3) or the confederate (C); as belonging to one of the two general behavior classes; as being either positive (+) or negative (−) in type; and as having been initiated or responded in nature. Teacher reinforcement events were entered by placing the symbol (t) just above the social behavior immediately preceding delivery of the event. Teacher prompts were recorded in a like manner, using the symbol (P). However, no reinforcement events or prompts were observed to occur throughout the study.

On each experimental day, two observers were seated at a three-station observation desk, each station partitioned from the other. All observations were made from a room immediately adjoining the playroom. Interrater reliability was calculated by dividing the total number of social behaviors and corresponding topographic descriptors recorded in agreement by that number plus those recorded in disagreement, then multiplying by 100. Agreement was reached only when both observers marked the same behavior (S_1 , S_2 , S_3 , or C), the same topographic symbols (+ or −), in the same position (before or after behavior symbol), in the same general class, within the same interval block. To alleviate any reactive effects of reliability assessment, the observers were informed that their protocols were to be compared periodically, although they were kept naive regarding the schedule of reliability assessment.

Intervention Procedures

A peer confederate (one for each triad), who emitted positive social behaviors toward the boys, was used to accelerate the subjects' frequency of emitting positive motor-gestural and

vocal-verbal behaviors. These two boys were siblings of other children in the treatment center. The confederates were enrolled in a day-care program housed at the center. They were selected to participate after observation revealed that they were the most socially active children in the day-care class. Stanford-Binet (Form L-M) IQ scores on the confederates were as follows: Confederate 1, 130; Confederate 2, 128. Confederate 1 was 47 months old and Confederate 2 was 48 months old.

Four 20-min training sessions were conducted with each confederate separately before the initial intervention period began. During these sessions, the confederates were told that they were to try their best to get the other children to play with them. The confederates were also exposed to role-playing situations with the experimenter. In these episodes, the experimenter assumed the behavior pattern typical of the subjects, and encouraged the confederate to initiate social play. The experimenter repeatedly told the confederates that many of their attempts to play would likely be ignored, but that it was important to maintain social contact as much as possible. At the end of each experimental day, the experimenter verbally praised specific behaviors exhibited by the confederates. The specific instructional methods employed during the training sessions are presented in Table 1.

Experimental Design

The study employed a withdrawal of treatment design (Baer, Wolf, and Risley, 1968). The procedures in each condition are presented below:

Baseline 1. The confederates were instructed not to initiate any social play with the subjects. However, no attempt was made to influence the behavior of the confederates regarding social initiations by the target children. The confederates were specifically told to, "Do as you would usually do", when approached by target children. The accompanying teacher was instructed to remain as physically isolate as possible from the children, and not to prompt or reinforce any

Table 1
Training Procedures Employed during Each of Four Confederate Instructional Sessions

<i>Training Procedures</i>	<i>Desired Confederate Behavior</i>	<i>Consequences and Schedule of Delivery</i>
SESSION 1		
The experimenter instructs the confederate that he is going to learn how to help the experimenter by getting other children to play with him. The experimenter indicates that asking children to play a particular game is what they will practice first. Experimenter then models appropriate behavior and asks confederate to try asking him to play (sequence has 10 repeats).	"Come play", "Let's play school", "Let's play ball", etc.	Experimenter delivers social praise to confederate on an FR 2 schedule. Experimenter ignores every other response, then says, "Many times children will not want to play at first, but you need to keep asking them to play."
The experimenter instructs the confederate that it is also important to give children toys to play with. The experimenter models appropriate behavior and asks confederate to try giving him something to play with when he invites him to play (sequence has 20 repeats).	verbal behavior identical to that shown above plus handing a play object (ball, block, toy truck, etc.) to experimenter	Experimenter delivers social praise to confederate on an FR 2 schedule. Experimenter ignores every other response, then says, "Sometimes children won't play, even when you ask nicely and give them something to play with, but you will need to keep trying very hard to get them to play."
SESSIONS 2, 3, 4		
Repeat of Session 1	Same as Session 1	Same as Session 1

positive social behavior by any of the children. This desired teacher behavior did not represent a departure from the typical free-play environment provided in the children's classrooms. The Baseline I condition continued for eight days, at which time a stable frequency of social responding was established.

Intervention I. The confederates were instructed each day that they were to try their best to get the other children to play with them. The accompanying teacher was instructed once again not to prompt or reinforce social play by any child.

Baseline II. This stage involved a return to conditions of Baseline I, in which the confederates were instructed not to initiate social play with the subjects, but to respond as they usually would if approached by a subject.

Intervention II. Intervention procedures were re-instituted in an effort to replicate the behavior change that was exhibited during the Intervention I stage.

RESULTS

Reliability

Twelve reliability computations were made across the experimental conditions as follows: Baseline I, two checks; Intervention I, four checks; Baseline II, two checks; Intervention II, four checks. Reliability on all behaviors reported ranged from 79 to 98%, with a mean of 89%.

Prebaseline Data

Across the five days of observation in this subject-selection phase, all subjects emitted very few social responses. For Triad I subjects, Mark, Ted, and Al, positive social initiations ranged from zero to three, with a group mean of 0.9 responses per day. For these same subjects, responded social behaviors of a positive nature ranged from zero to two, with a group mean of 0.9 responses per day. For Triad II subjects, Tommy, Dicky, and Steve, positive social initiations ranged from zero to four, with a group mean of one response

Table 2

Range and mean number of social initiations by Confederates 1 and 2 toward target subjects for each experimental condition.

<i>Experimental Conditions</i>	<i>Range</i>	<i>Mean</i>
Baseline I		
Confederate 1 toward:		
Mark	4-10	8.4
Ted	5- 7	5.2
Al	4- 9	6.1
Confederate 2 toward:		
Tommy	3- 8	5.3
Dicky	3-10	6.7
Steve	3- 5	3.8
Intervention I		
Confederate 1 toward:		
Mark	26-44	32.4
Ted	20-48	30.1
Al	25-36	31.5
Confederate 2 toward:		
Tommy	20-39	29.6
Dicky	22-36	30.0
Steve	24-40	33.4
Baseline II		
Confederate 1 toward:		
Mark	8-14	10.1
Ted	6-10	7.2
Al	4-12	8.9
Confederate 2 toward:		
Tommy	6-10	8.4
Dicky	4-11	7.2
Steve	6-10	8.9
Intervention II		
Confederate 1 toward:		
Mark	25-40	30.8
Ted	22-39	28.9
Al	25-38	32.4
Confederate 2 toward:		
Tommy	22-40	28.5
Dicky	30-39	33.5
Steve	23-35	29.5

per day. Responded social behaviors of a positive nature ranged from zero to six, with a group mean of 2.3 responses per day for the Triad II subjects.

Confederates' Behavior

Table 2 presents the range and mean number of social initiations by Confederate 1 toward Mark, Ted, and Al and the same data for Confederate 2 toward Tommy, Dicky, and Steve for each experimental condition. Table 2 suggests that the experimenter's instructions resulted in reliable alterations in the number of social initiations emitted by both confederates. Additionally, these data show that the number of social initiations directed toward each subject was quite similar.

Table 3 presents the range and mean per cent of social initiations by subjects that the confederates responded to across all experimental conditions. Table 3 shows that the confederates regularly attended to a high percentage of subject social initiations regardless of experimental condition.

Subjects' Response to Confederates' Initiations

Figure 1 presents the frequency of positive motor-gestural and vocal-verbal behaviors by Mark, Ted, and Al (Triad I) and Tommy, Dicky, and Steve (Triad II) in response to confederates' initiated responses.

The top portion of Figure 1 reveals that all Triad I subjects emitted few positive social be-

Table 3

Range and mean per cent of social initiations emitted by subjects that the confederates responded to positively for each experimental condition.

<i>Subjects</i>	<i>Experimental Conditions</i>							
	<i>Baseline I</i>		<i>Intervention I</i>		<i>Baseline II</i>		<i>Intervention II</i>	
	<i>Range</i>	<i>Mean %</i>	<i>Range</i>	<i>Mean %</i>	<i>Range</i>	<i>Mean %</i>	<i>Range</i>	<i>Mean %</i>
Mark	100	100	80-100	96	75-100	93	90-100	97
Ted	100	100	87-100	97	100	100	100	100
Al	100	100	100	100	66-100	89	75-100	94
Tommy	75-100	90	75-100	92	100	100	80-100	96
Dicky	100	100	100	100	100	100	67-100	93
Steve	100	100	87-100	95	50-100	87	100	100

haviors during the Baseline I condition. The level of positive social behavior observed during this phase closely matches the level observed during the Prebaseline assessment. With increased social initiations by Confederate 1, the positive social behavior of all subjects increased dramatically during the Intervention I phase. Also, it is evident that the subjects were affected differentially by the intervention, with Mark responding most consistently to social initiations, followed by Al, then Ted. This differential re-

sponding parallels the initial social responsiveness demonstrated by the subjects during Baseline I. During Baseline II, when the frequency of confederate initiations was reduced, the subjects' frequency of positive social behavior decreased abruptly. The differential increase in positive social responding that was exhibited during Intervention I was replicated during the Intervention II phase.

The bottom portion of Figure 1 reveals that all Triad II subjects emitted a stable, low fre-

Fig. 1. Frequency of positive motor-gestural and vocal-verbal behaviors by Mark, Ted, and Al (Triad I) and Tommy, Dicky, and Steve (Triad II) in response to confederates' positive initiations.

quency of positive social behavior across the Baseline I phase. When Confederate 2 accelerated the rate of social initiations toward the subjects, positive social responding by each subject increased accordingly. However, Tommy's behavior was affected minimally. A subsequent decrease in Confederate 2's social initiations during Baseline II was accompanied by an abrupt deceleration in positive social responding by all subjects. An increase in Confederate 2's social initiations during Intervention II again increased

the social responding of each subject. Once more, a marginal increase was exhibited by Tommy.

Subjects' Social Initiations

The data collection system also included a record of the social behaviors initiated by the subjects. These data for each triad are presented in Figure 2. An initial review of these data indicated that approximately one-half of the social initiations emitted by each subject were directed toward the confederate. The remainder was

Fig. 2. Frequency of positive motor-gestural and vocal-verbal behaviors initiated by Mark, Ted, and Al (Triad I) and Tommy, Dicky, and Steve (Triad II) toward each other and confederates.

evenly distributed among the other subjects in the triad.

The top portion of Figure 2 indicates that Triad I subjects seldom initiated any positive social behavior toward each other or Confederate 1 during the Baseline I phase. During Intervention I, Triad I subjects emitted an increased number of initiated social responses. The differential responsiveness of the subjects to confederate initiations that was noted earlier was also evident in the relative frequency of social initiations emitted by the three subjects. Specifically, Mark emitted the most initiations, followed by Al, then Ted. The reduction of Confederate 1's social initiations during Baseline II was accompanied by an immediate decrease in the frequency of social initiations by all subjects. The re-institution of intervention procedures replicated the differential increase in social initiations by Mark, Ted, and Al during Intervention I.

The bottom portion of Figure 2 shows the frequency of social initiations by Triad II subjects across all experimental conditions. During the Baseline I phase, all subjects exhibited a low, stable frequency of initiated social behaviors. Increased social initiations by Confederate 2 produced a dramatic increase in social initiations by Tommy and Dicky. Steve's frequency of social initiations was not affected by the intervention procedure. The reduction of social initiations by Confederate 2 during Baseline II was accompanied by a parallel decrease in social initiations by Tommy and Dicky. The results produced during Intervention I were replicated during the next phase of accelerated confederate initiations, Intervention II. Again, the frequency of Steve's social initiations was not affected by the intervention procedure.

DISCUSSION

The major findings were: (a) the intervention procedure consisting of increased social initiations by a peer confederate increased the positive social behaviors of all subjects in response to these events; (b) the intervention procedure also

increased the frequency of initiated positive social behaviors by five of the six subjects; and (c) the intervention procedure produced differential effects in direct relation to the subjects' initial social behavior repertoire.

The data regarding subjects' responses to confederates' initiations expand earlier correlational studies that documented an occasion setting effect to social stimuli (*e.g.*, Brazelton *et al.*, 1974; Kendon, 1967; Patterson and Reid, 1967). Additionally, these results indicate that previous findings regarding "spillover" of treatment effects on withdrawn children's social behavior (Strain *et al.*, 1976; Strain and Timm, 1974) may have been due, in part, to the setting effects of social stimuli emitted by target children. The practical implication of the demonstrated setting effect of social stimuli is readily apparent. It would seem that integrating children who display good social skills with isolate youngsters could be employed to enhance the latter's social behavior development. It should be emphasized, however, that the mere integration of children with divergent social repertoires would probably not result in positive social development. Rather, careful instruction and programming of peers seem to be required (Solomon and Wahler, 1973; Surratt, Ulrich, and Hawkins, 1969; Wahler, 1967).

A fine-grain analysis of the observed increase in positive social initiations by five of the six subjects indicated that most "successful" initiations (those followed by a positive peer response) were vocal-verbal. Typically, successful initiations involved suggestions for play activities or other statements that served to structure the play situation. This verbal requirement for social initiations is a likely explanation for the low frequency of this behavior exhibited by Steve (Subject 6), who was nonverbal except for an occasional "Yes", "No", or "Mommy". Children with a limited verbal repertoire, such as that exhibited by Steve, may require specific training of appropriate verbal responses if they are to develop a complete social repertoire. The increase in positive social initiations by the other subjects

may be viewed, in part, as indicating the extent to which the subjects imitated the confederates' positive social behavior. However, this explanation is not entirely satisfactory, given the extremely limited imitative repertoire of all the subjects and the complexity of the behaviors in question.

The importance of precise behavioral assessment in remediating social response deficits is highlighted by the response patterns demonstrated by Tommy (Subject 4). As the bottom portion of Figure 1 suggests, the intervention procedure had a reliable though minimal impact on his responded social behaviors. However, unlike other subjects, his frequency of initiated positive social behaviors increased in direct proportion to his responded social behaviors (see Figure 2, bottom portion). Tommy was the only subject who was abusive toward his peers, and though he would initiate play with them, they typically moved away as he approached. Likewise, both observers provided anecdotal reports that Confederate 2 initiated play with Tommy only from a considerable physical distance. This physical distancing prevented the occurrence of any motor-gestural interaction between Confederate 2 and Tommy. Such an interaction pattern was not observed between the confederates and any other subject. Together, the behavior patterns exhibited by Steve and Tommy indicate that social isolation represents a multiple response deficit with accompanying demands for differential treatment procedures.

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