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# PROMOTING PEER INTERACTION THROUGH INCIDENTAL TEACHING: SOME DIRECT AND GENERAL EFFECTS ON CHILDREN WITH DISABILITIES

A Thesis

Presented for the

Master of Science Degree

The University of Tennessee, Knoxville

**Lisa Bleattler Kelly**

**May 1995**

# DEDICATION

This thesis is dedicated to my husband,

Sean Kelly

and to my family,

Edith Bleattler
John Bleattler
Karen Bleattler
Edith Powell

for your support and belief in my dreams
and encouraging my love for learning.

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## ABSTRACT

The purpose of this study was to examine the effects of incidental teaching, a naturalistic approach that has been used to teach language skills to children with disabilities, on the frequency of peer interaction in preschool-aged children with disabilities. Incidental teaching was defined as a child-initiated approach that takes place within the context of daily classroom activities where the teacher utilizes the child's interest in play materials as a natural reinforcer for engaging in prompted behavior.

Two children enrolled in a mainstreamed classroom participated in the study, one of whom was diagnosed with Down's Syndrome, and the other of whom was diagnosed with Developmental Delay. A multiple-baseline without replication on the second child was used to examine the effects of incidental teaching on spontaneous social interaction. Results suggested that incidental teaching produced direct effects by promoting peer interaction through teacher prompting and generalized effects by promoting spontaneous interactions with peers during nontraining intervals. More importantly, the data indicated that the child who received intervention spontaneously interacted with peers at levels that were more often within the range of typical peer interaction compared to baseline levels, while social interaction remained at baseline levels for the child who did not receive intervention. Although no strong

causal conclusion could be drawn from either the empirical or anecdotal data, the increases in social interaction during intervention indicated that a closer examination of incidental teaching as a tool for promoting social skills in children with disabilities is warranted.

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# CHAPTER 1

## INTRODUCTION

The acquisition of social skills for young children is considered an important developmental and adaptational goal. The ability to interact effectively with peers during play is thought to help facilitate cognitive, language, emotional and motor development in young children (Hartup, 1978; Guralnick, 1986). As the young child matures, the ability to interact effectively and build relationships with peers will influence social and communicative aspects of later development that interactions with adults either cannot or will not produce (Hartup, 1978).

As early as the 1930's researchers concluded that preschoolers engage more often in parallel, associative and cooperative play than in solitary, onlooker, and unoccupied play (Parten, 1932). However, children with disabilities characteristically display deficits involving social competence, engaging in more solitary and unoccupied behavior than interacting with their normally developing peers (Odom & McEvoy, 1988; Guralnick, 1986; Cavallaro, Haney, & Cabello, 1993). Because integration of children with disabilities and their nondisabled peers by itself does not provide the sort of social context that facilitates social learning (Odom & Strain, 1984), teachers of mainstreamed classrooms must often employ some method of social skills

training in order to encourage interaction between children with disabilities and those without disabilities.

The purpose of this study was to examine the effect of incidental teaching, a naturalistic approach that has been used to teach language skills to children with disabilities, on the frequency of peer interaction in children with disabilities. Incidental teaching was defined as a planned approach by the teacher to provide children with educational guidance for identified social skills, such as initiation and response to peers, through natural, child-centered, play-based, teacher-child interactions. Specifically, incidental teaching was a child-initiated approach that took place within the context of daily freeplay activities where the teacher utilized the child's interest in play materials as a natural reinforcer for engaging in prompted social behavior. In the past, incidental teaching has been shown to produce spontaneous use of targeted communication skills across settings that endure over time (Hart & Risley, 1968, 1974, 1975). Researchers of peer interaction have been unable, with some exceptions, to find teaching techniques that produce comparable setting generalization and maintenance of social skills in children with disabilities.

Incidental teaching allows teachers to incorporate social skills training within the context of normal activities in typical preschool settings. Teaching children within a natural community of reinforcement such as a preschool

classroom should improve the likelihood that generalization will occur (McGee, Almeida, Sulzer-Azaroff, Feldman, 1992; Brown, McEvoy, & Bishop, 1991; Warren & Kaiser, 1986) . Additionally, the flexibility of the teaching method, which allows the teacher to incorporate incidental teaching techniques within normal teacher-child interactions at his or her own discretion, adds a dimension of practicality which in turn should help insure future utilization of the technique (Brown, McEvoy, & Bishop, 1991).

Can children with disabilities learn to use social skills, such as peer interaction, through naturalistic interventions like incidental teaching? Parents and teachers alike express the overwhelming need for teaching methods that can effectively promote peer interaction in children with disabilities that will endure over time and transfer across settings (Bailey & Wolery, 1992; Odom & McEvoy, 1988; Cavallaro, Haney & Cabello, 1993). The present study represented an effort to examine experimentally one teaching strategy that might increase both the frequency and generalization of peer interaction in children with disabilities and, in doing so, enable them to participate more fully in inclusive preschool settings.

# CHAPTER 2

## LITERATURE REVIEW

Incidental teaching consists of "a prespecified chain of child-teacher interactions which uses multiple examples of desired behavior within ongoing stimulus conditions" (McGee, Almeida, Sulzer-Azaroff, & Feldman, 1992). This method of teaching closely resembles that which naturally occurs in mother-child dyadic interaction (Warren & Kaiser, 1986). Incidental teaching episodes are brief and occur when children are interested in play materials, activities or other children, take place in unstructured freeplay activities for short periods of time, and begin when children show an interest in or are involved with materials, activities or other children (Brown, McEvoy, & Bishop, 1991). Cavallaro (1983) points out that incidental teaching may take place also during mealtimes and transitions as well as free-play activities.

The use of incidental teaching in promoting peer interaction is a new phenomenon. Research conducted over the past two decades has provided educators with a bulk of information regarding the direct and general effects of various strategies designed to improve young children's social skills (Brady, Shores, McEvoy, Ellis & Fox, 1987; Fantuzzo, Stovall, Schachtel, Goins & Hall, 1987; Gaylord-Foxx, Haring, Breen, & Pitts-Conway, 1984; Gunter, Fox, Brady, Shores, & Cavanugh, 1988; Strain, Kerr, & Ragland, 1979;

Strain, Shores, & Timm, 1977). However, past social skills training efforts have produced varying results in effectiveness, practicality, and generalization of targeted social behaviors. Direct intervention strategies that have received the most attention are: peer-mediated strategies including proximity (Odom & Strain, 1984), peer initiation (Brady, Shores, McEvoy, Ellis, & Fox, 1987; Strain, Shores, & Timm, 1977; Odom, Hoyson, Jamieson, & Strain, 1985; Fantuzzo, Stovall, Schachtel, Goins, & Hall, 1987), and group instruction such as affection or friendship activities (Brown, Ragland and Fox, 1988; McEvoy, Twardosz, & Bishop, 1990; McEvoy, Nordquist, Twardosz, Heckaman, Wehby, & Denny, 1988; Twardosz, Nordquist, Simon & Botkin, 1984); and teacher mediated strategies including prompt and reinforcement (Antia & Kreimeyer, 1988; Gaylord-Ross, Haring, Breen, & Pitts-Conway, 1984; Gunter, Fox, Brady, Shores & Cavanaugh, 1988; Kohl & Breckman, 1990; Kreimeyer & Antia, 1988; Lefebvre & Strain, 1989; Strain, Kerr, & Ragland, 1987) and, most recently, incidental teaching (McGee, Almeida, Sulzer-Azaroff, & Feldman, 1992; Brown, McEvoy, & Bishop, 1991).

Social Skills Training Strategies

Proximity methods involve the integration of children with disabilities with normally developing peers, expecting the natural transmission of social skills from typical peers to children with disabilities without direct social skills

training. (Odom & Strain, 1984). Lord (1984) integrated four children with autism with same-aged or younger typical children during 15-minute dyadic play sessions. When the subjects were grouped with other children with autism, little social interaction took place. However, when children with autism and typical children were grouped together, typical children were asked to "help the autistic child learn to play" and the children with autism were told to "go play". During the integrated dyad sessions, social responses increased for all four children with autism across sessions and the average physical distance between children decreased from a mean of more than 4 feet to less than 3 feet (Lord, 1984). However, a uniform increase in all social behaviors did not occur. Odom & Strain (1984) noted that, when compared to direct social skills intervention strategies such as prompt/reinforce and peer initiation methods, the proximity method tends to produce lower levels of social interaction. Research suggests that when children with disabilities are placed in programs with nondisabled children, the two groups tend to separate themselves; usually, very little social interaction occurs (Odom & McEvoy, 1988). Thus, direct intervention strategies designed to teach social behaviors are often necessary to promote peer interaction when integrating children with and without disabilities.

Researchers who use peer-initiation interventions train peers to initiate to socially withdrawn children, with social initiations conceptualized as "setting events", or peer-delivered social stimuli, for social responses (Brady, Shores, McEvoy, Ellis, & Fox, 1987; Fantuzzo, Stovall, Schachtel, Goins, & Hall, 1987; Odom, Hoyson, Jamieson, & Strain, 1985; Strain, Shores, & Timm, 1977). Using peer confederates in a laboratory setting, Strain, Shores and Timm (1977) increased the positive motor-gestural and vocal-verbal behaviors of six isolate preschool boys in response to social initiations from peer confederates and also increased the positive motor-gestural and vocal-verbal initiations of five of the six subjects toward other subjects and peer confederates. However, when intervention was withdrawn and baseline reinstated, the frequency of the subjects' positive social behaviors decreased abruptly. The decrease in social behaviors when the peer initiation intervention was removed indicates the subjects' probably were very dependent on the intervention in order to interact with peers.

The desired outcome of social skills training is not only to increase the child's frequency of interaction during intervention, but also to insure that the child will spontaneously use these skills at times when intervention is absent. In a similar study designed to evaluate the reciprocal nature of peer interaction, Odom et. al. (1985) examined the quality of peer social initiations.

At the beginning of the intervention phase, three peer confederates role played with adult trainers social initiations such as play organizer, sharing, share requests, assistance, affectionate and complimentary statements. During the structured play intervention, in which one of the students, one peer confederate, and at least one other typical peer engaged in a preschool activity such as cooking for 8-10 minutes, peer confederates were rewarded for evoking social responses from the children with disabilities. Social reinforcers such as a special handshake or a teacher's helper task served as reinforcers to the confederates and were awarded at the end of the day. Increases in positive social interaction for all three children with disabilities were observed during structured play sessions at levels above baseline when peer confederates offered initiations to them. Odom et. al. (1985) assumed that the provision of socially responsive peers in the table and learning center activities would promote generalization of social behaviors by providing a set of naturally maintaining contingencies. However, generalization from structured play to the table and learning activities did not occur. Yet, when intervention was introduced sequentially, first to the table activity and then to learning center, social interactions increased in both activities for all three subjects. Once again, increases in peer interaction in generalization settings were specifically dependent on the introduction of the intervention in those settings.

Taken together, the peer-initiation studies suggest that increases in initiations and responses to peers occur reliably in intervention settings when peers are trained to initiate to children with disabilities. Generalization to nonintervention settings, however, is not as likely to occur unless steps are taken to promote it (Brady et. al., 1987; Fantuzzo et. al., 1987; Odom et. al., 1985; Shafer, Egel, & Neef, 1984; Strain, Shores, & Timm, 1977).

Researchers utilizing prompt and reinforcement methods train teachers to prompt or give instructions to a peer confederate or child with disabilities and reinforce any social behavior that occurs (Odom & Strain, 1984). Using this approach, Strain, Shores and Kerr (1976) reported increases in social interaction between normally developing children and children with behavior disorders when teachers prompted and reinforced the children for engaging in social interaction during training sessions. Social interactions also occurred in other settings where the training did not take place. In another study, a teacher prompt and reinforce procedure was applied sequentially across dyads (composed of one child with autism and one typical peer) during structured play settings that took place in an experimental room. This type of intervention promoted increases in peer interaction for two children with autism during training sessions and one child during free-play generalization periods that took place in their typical classroom (Gunter, et al., 1988). Lack

of across-setting generalization may have been due to the absence of training in the free-play environment (Gunter, et al., 1988).

Normally developing children also may be trained to prompt and reinforce social interaction. Strain, Kerr and Ragland (1987), utilizing a withdrawal of treatment design, demonstrated that positive social behavior occurred when a trained peer prompted and reinforced the play behaviors of two autistic children in an experimental playroom. No increases in positive social interactions were observed during generalization assessments that took place almost 24 hours after the training sessions in the same experimental playroom. Lack of generalization across a short period of time within the same setting, the experimental playroom, suggests a weakness of the prompt and reinforce strategy in that the intervention must be implemented across time and setting in order to achieve desired increases in social behavior. However, Chandler, Lubeck, and Fowler (1992), in a review of the social skills generalization literature, reported that generalization was most likely to occur when prompt and reinforcement interventions took place. Thus, prompt and reinforcement strategies can be effective in producing increases in desirable social behaviors. However, an empirical demonstration of the variables that produce and control generalization and maintenance is still lacking. Consequently, researchers have begun to examine alternative naturalistic

approaches that may promote direct as well as generalized social skills in young children with disabilities.

Twardosz, Nordquist, Simon and Botkin (1983) developed group affection, or friendship activities, to increase positive peer interaction that may be used by teachers within the context of typical preschool routines. Affection activities include preschool games, songs and activities such as "Simon Says" that are modified so that Simon says "Give a friend a hug" in order to include affectionate responses (McEvoy, et al., 1990). Increases in peer interaction, peer social approaches, smiling, and active affectionate physical contact have been observed at levels above baseline, in nonintervention settings, and within the normative range of interaction for children who had mild to moderate disabilities (Twardosz et al., 1983) and severe disabilities (McEvoy, et al., 1988). Generalization during freeplay was reported in observations taken 24 hours after the affection activity occurred (Twardosz, et al., 1983). Brown, Ragland, and Fox (1988) replicated the group socialization procedures across two children in a multiple-baseline design. Results indicated that both subjects increased their rates of prompted and unprompted social interactions with peers in training and nontraining settings.

Affection activities have broadened the naturalistic avenue of investigation of peer interaction by offering intervention procedures that

promote social skills within the context of typical preschool activities, ones that appear to be pleasant and reinforcing to children. Moreover, group affection activities utilize peers as confederates in the social skills training. This strategy produces opportunities for the disabled child and peers to practice interacting with each other and increases the likelihood that social skills will generalize to settings where intervention does not take place. Like affection activities, incidental teaching was designed for use in the context of naturally occurring adult-child and peer-child interactions.

Until recently, research on incidental teaching has focused exclusively on language development. In their landmark study, Hart and Risley (1968) demonstrated that incidental teaching promoted the use of descriptive adjectives in the spontaneous speech of disadvantaged preschool children. When it is used to promote language, incidental teaching steps include: 1) arranging the environment to increase the likelihood that the child will initiate to the adult and, thereby, provide opportunities for teaching; 2) selecting language targets appropriate for the child's skill level, interest, and teaching opportunities; 3) responding to the child's initiations with requests for elaborated language responses resembling the targeted forms; and 4) reinforcing the child's communicative attempts as well as use of specific forms with attention and access to the objects in which the child has expressed an

interest (Warren & Kaiser, 1986). Specifically, the child's engagement with the environment establishes an occasion for joint attention and sets the occasion for the teacher to prompt or model behavior that needs to occur if the child is to receive the topic of interest (Kaiser, 1993).

Incidental teaching provides teachers with an effective strategy for improving young children's language skills. For example, Rogers-Warren and Warren (1980) used a mand-model procedure similar to incidental teaching that is initiated by the teacher as opposed to initiating intervention when the child shows interest. The mand-model approach was used to increase the verbalization rates of three children with moderate to severe language delays. "Natural" reinforcers that are commonly found in typical early childhood classrooms were available during freeplay and served as reinforcers for the desired responses. Alpert and Kaiser (1992) extended the application of incidental teaching by training six parents of preschoolers with disabilities to implement incidental teaching at home. The results demonstrated that generalization occurred across household settings and effects were maintained for 3 months after training was completed.

Although incidental teaching has not been used nearly as often by researchers to promote social skills in children with disabilities, components of incidental teaching easily lend themselves to modification for social skills

training. Incidental teaching incorporates, for example, aspects of all of the social skills methods described above. For example, children with disabilities are integrated with typical peers as they are when proximity methods are used; children also are prompted and reinforced for social initiations and responses as they are when peer initiation and prompt and reinforcement methods are used; and training takes place in the context of natural classroom activities that appeal to children, just as group affection activities probably appeal to children with and without disabilities. Brown, McEvoy, and Bishop (1991), in a review of incidental teaching, recognized these similarities when they suggested that incidental teaching, if implemented properly by teachers within the context of common classroom activities, may be more effective as well as more practical and efficient than other methods of social skills training. Use of incidental teaching to promote social skills, as opposed to group affection activities, offers teachers an opportunity to teach children social skills in a non-group, unstructured freeplay setting. This method adds to the possible strategies a teacher can utilize when promoting peer interaction in the classroom.

In an effort to examine some of these possibilities, McGee, Almeida, Sulzer-Azaroff, and Feldman (1992) conducted a study in which incidental teaching was used to foster reciprocal peer interactions during classroom

freeplay activities. In this study, peers were trained to use incidental teaching during interaction with children with autism. Training occurred in the context of free-play activities and incidental teaching episodes were sequenced for the peer tutors as follows: wait for the subject to initiate a request for a toy, ask the subject to label the toy, give the toy to the subject when he labeled it, and praise the subject's correct answer (McGee, et.al., 1992). Peer tutors were arbitrarily rotated among target children in order to take potential advantage of programming multiple exemplars (McGee, et al. 1992). Data indicated that reciprocal interactions, consisting of initiations to and from the subjects and also subject responses to initiations, increased among all three children with autism as well as peer tutors in the training free-play sessions. However, increases were observed in one child only during the nontraining free-play periods that occurred throughout the day (McGee, et al., 1992). In addition, teacher ratings on the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children indicated that peer acceptance toward all three subjects was higher after intervention compared to ratings taken at the beginning of intervention. Additionally, peer ratings of the subjects on a sociometric scale were more positive during the 5 month training interval compared to baseline ratings (McGee, et al, 1992). Taken together, these findings are very encouraging and suggest that future research on the direct

and general effects of incidental teaching as a means of promoting social skills in young children with disabilities is certainly warranted.

Purpose of the Study

Research has demonstrated that incidental teaching is an effective means of promoting language skills in both disadvantaged children and children with disabilities that are durable and generalize across settings. A similar body of empirical evidence remains to be gathered that demonstrates the effects of this procedure on the social skills of young children with disabilities. The language literature also indicates that incidental teaching is an effective means of teaching important skills within the natural context of preschool environments, suggesting that teachers might be more inclined to use it than other means of promoting peer interaction. Such an effect, however, remains to be demonstrated. Generalization of social skills over time and across settings is perhaps the most pervasive problem for which there is, as yet, with the exception of group affection activities, no empirically demonstrated solution. Most studies that include generalization results indicate that peer interaction does increase above baseline, but stabilizes well below intervention levels once procedures are discontinued (Brady et. al, 1987; Odom et. al., 1985, Fantuzzo et. al., 1987, Shafer, Egel, & Neef, 1984; and Gunter et. al., 1988). A successful intervention must demonstrate the

acquisition of more enduring skills, ones that continue to occur without the continued need of teacher or peer assistance. Hart & Risley (1968) noted that "knowing" is not considered a sufficient criterion for skill usage; rather, spontaneous emission in every day situations is probably a better way of defining the acquisition of a social skill. Although Hart and Risley (1968, 1974, 1975) have focused their research on promoting language skills in young children, the same criterion for skill usage probably should be applied to social skills learning as well.

Stokes and Baer (1977) suggest that generalization does not automatically occur simply because a behavior change is accomplished. It is their view, based upon research, that investigators must program for generalization. Incidental teaching components contain many of the generalization promoting strategies described by Stokes and Baer (1977). For example, incidental teaching is used most effectively in settings that include opportunities for the occurrence of natural maintaining contingencies. Also, it allows adults to mediate the physical environment by contingently responding to the child's behavior, providing models and feedback for the content and form of the behavior, and controlling access to reinforcing aspects of the natural environment (Kaiser, 1993). The physical environment, therefore, becomes a contingent event for desired behavior (Kaiser, 1993). In addition,

when incidental teaching is used for the purpose of promoting social skills, teachers have the opportunity to prompt a child with disabilities to interact with a variety of typical children. Typically, just one or two peer confederates are included when peer-mediated initiation and prompt/reinforce strategies are used to promote social skills. Thus, incidental teaching may be an effective means of promoting generalization over time and across settings because it lends itself so well to the use of multiple exemplars (Stokes & Baer, 1977). Furthermore, because a child's interest in materials or peers is highly variable, incidental teaching is conducted with relatively little adult control over the reinforcing stimuli, thus creating an approach to training that is referred to as "train loosely". Such a strategy also is known to produce generalization effects (Stokes & Baer, 1977). Finally, by incorporating typical peers in the teaching process, a condition referred to as "programming of common stimuli" may occur. Stokes and Baer (1977) suggest that peers are particularly suitable "common stimuli" in the sense that they are present in both training and generalization settings and therefore increase the likelihood that skills will generalize from training to nontraining conditions.

Incidental teaching offers the hope of promoting social skills in children with disabilities, ones that occur spontaneously in the natural settings of typical preschoolers. In the proposed research, therefore, the effect of incidental

teaching on the peer interaction of children with disabilities was examined. Unlike McGee et al. (1992), however, teachers (as opposed to peers) conducted incidental teaching in an effort to train not only spontaneous verbal behavior, but also spontaneous nonverbal skills that are important components of peer interaction. Additionally, the diversity of interactions between a child with disabilities and his typical peers, as well as generalization of interactions that occurred in nontraining conditions was examined. The study addressed, therefore, the following questions:

1. Will incidental teaching increase the frequency of spontaneous interactions between children with disabilities and their peers in freeplay settings?
2. Will increases in peer interaction occur in the absence of incidental teaching, that is, when children with disabilities are presented with natural opportunities to interact with typical peers?

# CHAPTER 3

# METHODS

## Participants

Two children enrolled in a mainstreamed classroom at the University of Tennessee Child Development Laboratories participated in the study. "Alexa" was four years of age and was diagnosed with Down Syndrome. According to both The Bayley Scales of Infant Development and Vineland Adaptive Behavior Scales (Interview Edition), she was functioning within the moderately mentally retarded range and met the criteria for mentally retarded and language impaired for the Knox County Public School System. Alexa used a mixture of expressive speech and sign language to communicate with children and adults. She could verbally ask for "more", say "no", ask for a "hug", name objects in books and pictures and repeat words when prompted. She was able to imitate 3-word phrases and 4-syllable utterances and followed adult requests as well as some 2-step commands. Social behaviors included high rates of onlooker and unoccupied play behaviors, moderate rates of hitting and inappropriate affection gestures, and rare instances of unprompted social interaction with peers. However, she did seek proximity to some preferred children. Alexa generally did not stay on task for more than a few minutes unless prompted by adults or peers. Unfortunately, factors in Alexa's personal

life deemed the use of intervention inappropriate, therefore, incidental teaching was not applied to her.

"Juan" was four years of age and met the criteria for Developmental Delay in the Knox County Public School System. Unlike most children in the classroom, Juan only attended the preschool three days of the week (Monday, Wednesday, and Friday). The Preschool Language Scale, Sequenced Inventory of Communication Development, Peabody Picture Vocabulary Test, and Brigance scores of speech and language development place him in the 2 to 2 1/2 year old range of age. He also had a rating of moderate/severe impairment on the Communication Rating Scale for Knox County Public Schools. The Bayley Scales of Infant Development indicated delays of approximately 12 months in both mental and motor areas of development. He could use 4 and 5 word combinations to comment on his own actions and also express a variety of questions. He had difficulty describing events and reasons for his or other's actions but he was able to verbally express needs clearly. He displayed repetitive self-stimulatory behavior with objects such as blocks. Juan usually remained in one area of the classroom for 15-minutes or more and stayed on task for at least 10-minutes, sometimes more. He exhibited well established parallel play and frequently sat in close proximity to small groups of children, very often watching them play. He was not able to recall

children's or adult's names in the classroom, but he did hug teachers and, when prompted, peers. On occasion he responded to peer social initiations, yet he rarely initiated play with peers.

Typical children who were available to participate in the intervention included 3-5 year old children enrolled in the preschool classroom. Teachers participating in the study included one full-time Child Specialist (Lead Teacher), and one half-time Child Care Assistant. The lead teacher exclusively was responsible for implementing the intervention.

Setting and Materials

The study took place in The University of Tennessee Child Development Laboratories. Twenty children attended the classroom on a full-time basis. The classroom had equal numbers of boys and girls ranging in age from 3 to 5 years. Baseline and intervention took place during the indoor and outdoor free play activities from 10:00 a.m. to 10:50 a.m., and 11:00 a.m. to 11:50 a.m. respectively. The classroom environment was organized into learning centers such as blocks, discovery (math and science), books, drawing and writing, art, imaginary play, and puzzles and games. Materials were rotated each week. The classroom schedule included freeplay times throughout the day that allowed the children to rotate freely between learning centers and choose materials as they wished.

Materials used during the intervention probe included toys that occurred naturally in the preschool classroom. Toys were targeted that facilitated peer interaction (for example, blocks) rather than solitary play (for example, books) and were preferred by each participant. Toys selected most frequently in the natural preschool classroom during the baseline condition by each participant were considered preferred. Preferred toys were placed as they would typically within the free play setting. The teacher could then identify when the child showed interest in a preferred toy, and then decided to implement incidental teaching.

Measures

Observers recorded the occurrence of child, peer, and teacher behaviors using the following definitions. The initials of

peers also were recorded.

> Spontaneous Interaction (SI)- Any unprompted child initiation or response to a peer that is positive, including organizing play, playing cooperatively, sharing, communicating or showing affection.
>
> Prompted Interaction (PrI)- Any positive interaction with a peer that took place as a result of a direct verbal or nonverbal prompt from a teacher, including affection.
>
> Negative Interaction (NI)- Any interaction that resulted in inappropriate social behaviors or terminated peer interaction including aggressive acts such as: hitting, kicking, biting, spitting; and unwelcomed affection gestures.

No Interaction (NO)- No social interaction took place during the interval. The participant engaged in solitary, parallel, or unoccupied behavior.

Smiling (Sm)- Any time the participant smiled at a child or adult, or laughed at or with them (adapted from Twardosz, et al., 1983) as a means of expressing enjoyment or acceptance.

Onlooker (On)- Any time the participant watches another child or group of children for a full interval. The participant may or may not be doing something while looking.

Teacher interaction (TI)- The participant is engaged in verbal or nonverbal social interaction with the teacher, including compliance with verbal, nonverbal or physical guidance in disciplinary or caretaking routines.

Incidental Teaching (IT)- Any time the teacher implements incidental teaching.

Caution (CA) - Any time incidental teaching is implemented and the child and/or peer clearly act as though they do not want to play with each other.

(See Appendix A for a copy of the actual coding sheet.)

Observation Procedure. A time sampling procedure with 10-second intervals was utilized to obtain, on the average, 10-minute samples of the social behaviors of each participant. In addition, typical children in the classroom were observed by the same observation system to establish a normative range of social interaction for the class. Observers scored one participant for six intervals, then observed a typical child who was in close proximity to the participant for a total of six intervals. Observers continued to

rotate between participants and typical children for two hours or until the freeplay sessions ended.

Anecdotal records were also collected on an intermittent basis by the researcher. These records consisted of a narrative record of events and behaviors that took place within the classroom during baseline and intervention conditions.

Observer training. Three undergraduate students were trained to use the observation system. Observers were not informed about the experimental nature of the study. Formal observations began when observers: 1) memorized the behavioral definitions, 2) identified the initials of each child in the classroom and 3) demonstrated that they were able to agree on the occurrence of individual child, peer, and teacher behavior 80% of the time.

Reliability and Validity. Interobserver agreement was evaluated on a weekly basis by comparing the primary observer's scores on the scoring form with the scores of the reliability observer. Agreement was computed by dividing (agreements) by (agreements plus disagreements) and multiplying this figure by 100 to obtain a percentage of agreement.

During intervention, the researcher observed the implementation of incidental teaching on a daily basis to monitor the experimental validity of the intervention. A checklist of components of incidental teaching was scored

each time incidental teaching was used (see Appendix B). Feedback was then given to the teacher at the end of each session if any component of incidental teaching was left out. Further training could then ensue to insure the incidental teaching was implemented in the correct manner.

Teacher Training

One classroom teacher was trained to implement incidental teaching during indoor and outdoor freeplay. Training began when components of incidental teaching were modeled for the teacher. Then the teacher was coached by the researcher to identify appropriate times to implement incidental teaching. Scenarios of actual child behavior were used to question the teacher on how she would proceed in implementing incidental teaching. Finally, the teacher began to use incidental teaching in the classroom and on the playground in close consultation with the researcher. Incidental teaching components, adapted from Hart & Risley (1975), are described below and displayed graphically in Figure 1.[1]

Child Interest in Peers and Play Materials. The teacher becomes alerted to the possibility of using incidental teaching when the participant is

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[1]All tables and footnotes may be found in Appendix C.

looking at other children or shows interest in a toy that had been identified as preferred during baseline.

Decision for Incidental Teaching. The teacher must then decide if it is an appropriate time to use incidental teaching. This decision is made based on several factors. The first factor is the time of day, for instance, if the participant shows interest in a peer close to the end of the free play session, the teacher may decide not to implement incidental teaching. The second factor is the participant's interest in a peer or toy. For example, at the beginning of the intervention period, the teacher should use incidental teaching only with peers who have shown high rates of positive social interaction with both the participant and other children in the past to help insure successful positive interaction. In addition, the teacher should make a decision to use incidental teaching primarily when the participant shows interest in toys that have been identified as reinforcing for each participant. Once the teacher decides to use incidental teaching, s/he will then withhold use of the toy until the desired social behavior is obtained. Finally, if the child indicates a refusal, whether verbal or nonverbal (crying or acts of aggression), to attempt interaction, the teacher decides against using incidental teaching.

Type of Social Behavior Targeted. Once the teacher has decided to attempt incidental teaching, s/he must decide what type of social behavior is an

appropriate expectation for the participant. The targeted social behavior may include an initiation or response to a peer. For example, the child may be expected to "find a friend" before she or he is allowed to play with a desired toy or large piece of equipment.

Type of Cue Used. The teacher must then decide what type of cue will be used to attempt to prompt the desired behavior. Incidental teaching uses two kinds of cues: focused attention, and attention plus verbal cue. Focused attention refers to the teacher looking directly at the child and waiting for an appropriate response (the desired social behavior). For example, the teacher focuses her attention expectantly upon the child and waits for the child to make an initiation to a peer. In addition, the teacher may use focused attention plus a verbal cue. For example, if the child shows interest in a preferred toy, the teacher would first look expectantly at the child then cue the child by saying, "If you want to play with the (toy), then you must first find a friend (with whom to play)". When the desired behavior is obtained from the cue, the incidental teaching ends and the teacher's presence is faded to allow for peer interaction as shown in Figure 1.

Degree of Prompt. Further prompts are used if the desired behavior is not obtained from the teacher cue. As depicted in Figure 1, incidental teaching prompts are divided into three degrees: 1) Fullest Degree, 2) Medium

Degree, 3) Minimal Degree (defined in the section Behavioral Definitions). The type of prompt used depends on the individual child and situation. The fullest degree of prompt is used primarily when the teacher has experienced little or no success in obtaining the desired behavior from the child in the past and marks the beginning of the child's skill usage. This level of prompting involves a full model and verbal prompting from the teacher. For example, the teacher might say "Come over and ask if you can play" and models by saying "Can we play?" then sits the child down next to a peer and shows how to begin playing with the child by taking turns building a house. The medium degree prompt involves a reduction of the adult prompt and only partial modeling of the desired behavior until the behavior is spontaneously emitted. For example, the teacher cues the participant by asking "Do you want to play? You need to ask him. Say 'Can I play (help, etc)'", wait for an appropriate social response from the participant, then prompt for imitation by saying "Can I ..." and partially model any gestural actions that may go along with the prompt (such as smiling, tapping the child on the shoulder or pointing to the materials with which the child is working). The third, minimal degree, prompt involves the teacher prompting for the desired behavior by direct request. For example, the teacher asks "What do you need to say (to the child)?" or "What should you do?". Once the desired social behavior is

obtained, the teacher ends the incidental teaching procedure and fades his/her presence. If the desired behavior is not obtained the teacher may decide to use incidental teaching once more or terminate the session until another opportunity for incidental teaching arises. Over trials, the teacher provides less assistance based upon a specific performance criterion at each level of prompt. The teacher discontinues a full model of the desired response, for example, when the child and peer can successfully interact with each other for at least 30-seconds over three consecutive trials. In a similar manner, decisions could be made to use partial prompts until, hopefully, no help at all is required.

Support Strategies

Incidental teaching was strengthened in a number of ways during intervention to promote its effects on peer interaction. First, the teacher was trained at the onset of intervention (session 12) to identify not only toys that Juan preferred, but also toys that were conducive to social play with a peer. Certain toys seem to set the occasion for social behaviors (Martin, Brady, & Williams, 1991). Thus, the teacher was coached by the researcher to attempt incidental teaching when Juan showed an interest in small building blocks that he liked to play with and also could be shared with a friend. When Juan showed an interest in toys that set the occasion for solitary play, for example a

puzzle, the teacher was not encouraged to implement incidental teaching. Additionally, time constraints were placed on the amount of time Juan was allowed to spend in solitary play, beginning with session 17. For instance, Juan was told that he could look at two books and then had to find a friend with whom he could play. The teacher assisted Juan by guiding him to look around the room and then asking him to choose a peer or toy with which he wanted to play. The teacher would then use incidental teaching where necessary to facilitate social interaction. This approach is not consistent with the typical way incidental teaching is conducted because incidental teaching is typically child-initiated. However, this strategy was nevertheless necessary to create a balance that increased the opportunities for the teacher to conduct incidental teaching and thereby encourage social interaction while also allowing Juan some time to play by himself.

Another support strategy that was employed at the onset of intervention (sessions 12 and 13) to strengthen the intervention involved talking to the classroom peers in small groups about establishing friendships with Juan. Because many of the typical peers belonged to well-established play groups, many peers were unwilling to accept new peer initiations. In order to gain cooperation from the typical peer, the researcher invited small groups of them (4-6 children at a time) to a special meeting in the teacher's lounge. The

researcher asked the children a number of questions about friendship including; how they felt when they played with friends, how they would feel if they had nobody with whom to play, and how they would feel about helping Juan make friends. The researcher then explained to the peers that they could help Juan make friends by playing with him when he invited them to play. Previous research has demonstrated that this kind of peer utilization and coaching procedure can increase the likelihood that peers will interact with the participant (Hodgens & McCoy, 1990). In the present study, however, peers were not trained over several sessions but were merely sensitized during the brief discussion to the participant's social dilemma and invited to "help out". Peers were told that if they did not want to play with Juan they could say "no" at any time. During the meeting, many of the children expressed a desire to help Juan and said that they would try to be his friend.

To further increase the chances of successful outcomes of incidental teaching, prior to each attempt at incidental teaching the teacher identified a typical classroom peer and asked that peer if she or he would play with Juan if Juan invited her or him to play. This strategy was implemented starting with session 13. Only when the peer said "yes" would the teacher attempt to use incidental teaching with Juan, guiding his initiation to the identified peer. By employing the peer as a "confederate" the teacher was able to increase Juan's

chances of success in initiating a social interaction. The decision to employ the confederate was made after Juan expressed an unwillingness to initiate to peers, indicating that the peers would not want to play with him. This type of strategy has been shown previously to be effective as well as sufficient for promoting peer interaction (Nordquist & Bradley, 1973). After a few successful attempts, Juan no longer asked whether a peer would accept his initiation.

Once Juan was comfortable in asking peers to play with him, the teacher used incidental teaching to focus on increasingly complex social skills that are typically needed to interact effectively with a peer. For example, when Juan was cued to "find a friend", he was prompted to use the peer's first name when initiating an interaction, stand close enough to the peer, and use a loud enough voice to let the peer know that he was talking to them. Additionally, Juan was prompted to follow through with initiations. For example, at the beginning of the intervention Juan was prompted by the teacher to run after a ball that was thrown to him from a peer instead of standing and looking around. As intervention proceeded, Juan became accustomed to many of the rules and behaviors of various childhood games and required less teacher prompting for following through. These strategies were implemented beginning with session 15.

Experimental Design

A multiple-baseline across subjects design without replication on the second child was used to evaluate the direct and general effects of incidental teaching. Baseline observations were conducted during freeplay periods in the preschool classroom. No form of intervention took place during baseline for either participant. When baseline measures of child, peer, and teacher behaviors were stable, incidental teaching was implemented for Juan, but not Alexa. Stability was defined by the observance of no clear trend of increasing spontaneous peer interaction and was judged by visual inspection of mean percentage scores of peer interaction over sessions. Incidental teaching could not be conducted with Alexa due to extenuating circumstances, but her baseline data did allow a comparison between Juan's intervention effects and Alexa's extended baseline frequency of peer interaction. If intervention frequencies of peer interaction increased, then at least there would be one demonstration of a possible causal link between incidental teaching and change in Juan's spontaneous peer interaction.

# CHAPTER 4

# RESULTS

## Reliability and Validity

Inter-observer agreement ratings were computed for 28% of the observations. Agreement was calculated separately for each behavioral code, then calculated for each subject individually and for typical peers as a whole. The mean agreement percentage and range for each behavioral category are depicted in Table 1. Interobserver agreement was at least 75% in each category for both Juan, Alexa, and the typical peers.

The validity of intervention was examined using the Validity Checklist for approximately half of all attempts at incidental teaching. Results of the validity checks indicated that the teacher was able to consistently implement the components incidental teaching in the correct manner. No additional training was necessary to assist the teacher's understanding of the components of incidental teaching.

Juan and Alexa each were observed an average of 10 minutes (582 intervals during baseline and 857 intervals during intervention) during 2 hour observation periods that occurred every other day. Observations occurred during indoor and outdoor freeplay activities for a total of 25 sessions over a 10 week time frame. Every peer in the classroom (18 different peers) was

observed in each the condition, an average of 4.4 times during baseline and 5.5 times during intervention. The number of different peers that were observed each session during baseline ranged from six to nine (M = 7.27) and four to 12 (M = 6.8) during intervention. The average number of intervals observed for a typical peer was 31.2 during baseline and 44 during intervention.

Intervention

The percentage of intervals of spontaneous interaction for Juan across conditions was examined to determine the possible effect of incidental teaching on Juan's social behavior. Figure 2 includes mean percentages of spontaneous interaction (SI) over both baseline and intervention conditions for Juan and Alexa as well as the daily mean percentage of SI for typical peers who were observed to be in close proximity to each participant and engaged in a similar activity. The mean percentage of SI for Juan and Alexa was computed by dividing the total number of intervals for each session into the number of intervals in which each participant spontaneously interacted with a typical peer during that session. Typical peer interaction did not include any interaction that may have taken place between Juan and Alexa. Figure 2 permits a comparison of Juan and Alexa to their classroom peers, using the mean percentage of spontaneous interaction, represented by the dashed line, to

represent what a "typical peer" might look like during baseline and intervention. The mean percentage for typical peers was computed separately for each participant in order to obtain a sample of peer behavior that was typical of peers engaged in a similar activity to each participant. The mean percentage of spontaneous interaction for the "typical peer" was computed by dividing the total number of intervals that peers were observed during each session into the total number of times that the peers were observed interacting spontaneously with another peer during that session.

The typical peer range, illustrated by horizontal lines, represents the distribution of individual peer percentages of spontaneous interaction. This range corresponds to the percentage of spontaneous interaction for the individual peer with the lowest mean percentage of spontaneous interaction and the individual peer with the highest mean percentage of spontaneous interaction computed separately for each participant and each condition (Juan: baseline = 16.6% - 72.2%; intervention = 16.6% - 83.3%; Alexa: 9.0% - 62.5%).

Not only do we see in Figure 2 a marked increase in the average percentage of spontaneous interaction from baseline (M = 15.97%, range = 6.6% - 35.1%) to intervention (M = 31.98%, range = 11.4% - 61.6%), we also see that Juan's percentages of spontaneous interaction per session more often fell within the range of spontaneous interaction for typical peers. Juan's

mean percentage of spontaneous interaction during baseline placed him at the lowest level of interaction in his class (of the typical peers). However, during intervention Juan's level of interaction was higher than five other children in his class. That is, once incidental teaching was implemented, Juan began to interact more frequently with a typical peer without prompting from a teacher at interaction levels that were comparable to most of the peers in his classroom. Because a discontinuous time sampling observation procedure was used, no specific criterion was employed for deciding if an interaction was spontaneous other than the prescribed definition stated in the Methods Section which notes that the interaction must occur in the absence of a prompt for that interval. Therefore, a spontaneous interaction may have been recorded a short distance in time following an interval in which incidental teaching took place.

Incidental teaching was not applied to Alexa, whose mean percentage of spontaneous interaction remained low across the entire study (M = 6.53%, range = 0% - 16.6%), apparently unaffected by the intervention that took place with Juan. Figure 2 illustrates that Alexa's mean percentage of SI remained well below the mean percentage of SI for typical peers engaged in similar activities and the peer range. In fact, Alexa's mean percentage of spontaneous interaction during Juan's experimental conditions dropped, however, slightly (baseline: M = 6.9%, range = 0% - 15%; intervention:

M = 5.7%, range = 0% - 16.6%). Alexa's mean percentage of SI placed her at the lowest level of interaction for her class.

Table 2 provides a closer examination of the distribution of individual peer percentages of spontaneous interaction for each condition for peers in close proximity to Juan. A comparison of Juan's mean percentage of SI per session to the peer distribution, as indicated by the range, the percentage of spontaneous interaction corresponding to each standard deviation from the mean, reveals a clear increase in his level of interaction toward the mean of his class. For example, during baseline Juan's percentage of interaction occurred within one standard deviation of the mean for only one session. Furthermore, during four baseline sessions, Juan's mean percentage of spontaneous interaction occurred below two standard deviations from the mean. On the other hand, Juan's mean percentage of spontaneous interaction per session during intervention occurred within one standard deviation of the mean for seven sessions, three of which were higher than the mean. The remaining sessions during intervention occurred within two standard deviations of the mean.

The effect of teacher attention on the mean percentage of spontaneous interaction was examined as well. A measure of concurrent teacher attention was created by identifying intervals in which spontaneous interaction and

teacher interaction (TI) occurred within the same interval, or intervals in which spontaneous interaction was scored followed by an interval in which teacher interaction occurred, similar to previous research (Twardosz et. al., 1983). Figure 3 includes mean percentages of concurrent teacher attention over baseline and intervention conditions for Juan and Alexa. The mean percentage of concurrent teacher attention was calculated for each session by dividing the number of intervals in which concurrent teacher attention occurred by the total number of intervals in which each participant spontaneously interacted with a peer. The results indicate that for spontaneous interaction that occurred during baseline, 19.3% of the intervals for Juan and 57% of the intervals for Alexa concurred with some form of teacher attention. During intervention, 17.1% of spontaneous interactions for Juan and 35% of spontaneous interactions for Alexa concurred with some form of teacher attention. Figure 3 depicts the great variability in teacher attention associated with spontaneous interaction for Alexa which varied from 0% to 100% for several sessions. The variability in concurrent teacher attention for Juan appears to decrease from baseline to intervention.

The possible effect of incidental teaching on spontaneous interaction with typical peers is further supported by individual analyses of the indoor and

outdoor freeplay data.[2] Figure 4 illustrates that sharp increases in spontaneous interaction occurred during indoor freeplay when incidental teaching was used to promote peer interaction. Juan's mean percentage of spontaneous interaction during indoor freeplay increased from 9.6% during baseline to 31.5% during intervention. Figure 4 also shows a slight trend in the typical peer's frequency of spontaneous interaction as well.

Similarly, Juan's mean percentage of interaction with typical peers during outdoor freeplay increased slightly from 27.3% to 35.4% over baseline and intervention respectively. Although the significance of the increase in SI from baseline to intervention for the outdoor freeplay setting is questionable, Juan did appear to interact more often at percentages that were comparable for typical children who were engaged in a similar activity and in close proximity to Juan. These results are presented in Figure 5.

Table 3 depicts the overall change in Juan's behavior from baseline to intervention conditions. The mean percentages for each behavioral code for baseline and intervention conditions are presented. Mean percentages were

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[2]For three of the sessions (one during baseline and two during intervention), data could not be collected during outdoor freeplay due to inclement weather which restricted the class to indoor freeplay only.

computed by dividing the total number of intervals for each condition into the number of intervals in which the behavior was observed.

The condition percentage for SI doubled from baseline (M = 15.97%) to intervention (M = 31.98%), $t(24) = 7.67$, $p < .001$. The decrease in the percentage of No Interaction (NO) from baseline (M = 62.5%) to intervention (M = 39.7%) may represent a reciprocal effect from the rise in spontaneous interaction over the conditions. The mean percentages of Prompted Interaction (PrI) and Teacher Interaction (TI) rose slightly from the baseline condition (PrI: M = .001%; TI: M = 21.4%) to the intervention condition (PrI: M = 2.3%; TI: M = 29.1%). However, no trend was noted in the daily averages for either of these codes. Incidental Teaching (IT) was observed in 1.6% of the intervals during intervention. Incidental Teaching was utilized an average of 7 to 8 times per session, according to anecdotal records. Therefore, the mean percentage for IT remained low during intervention due to the low frequency of this behavior and the short daily sample (10 minutes of a two hour time period) of Juan's behavior. Mean percentages for Onlooker (On) and Smiling (Sm) decreased slightly from baseline (On: M = 1.2%; Sm: M = 3.9%) to intervention (On: M = .008%; Sm: M = 2.3%). Because the observers had difficulty remembering to score smiling and the reliability for the measure was low and variable, the data

cannot be analyzed as an accurate reflection of the either Juan's or the typical peer's enjoyment within the freeplay settings. Negative Interaction (NI) did not occur for Juan in either condition and observers did not score the Caution (CA) category to indicate misuse of incidental teaching during the intervention condition.

# CHAPTER 5

# DISCUSSION

This study was designed to answer two questions. The first question asked, "Will Incidental Teaching increase the frequency of spontaneous interactions between children with disabilities and their peers in freeplay activities?" The results clearly suggest that Juan's percentage of spontaneous interaction did increase from baseline to intervention. These findings are consistent with previous research involving incidental teaching (McGee et. al., 1993) and peer-mediated strategies (Twardosz et. al., 1983; Brady et. al., 1987; Strain et. al., 1977). Moreover, Juan's percentage of spontaneous interaction rose to levels that were more often within the range of typical peer interaction, similar to past findings where group affection activities were utilized (Twardosz, et. al., 1983). Because the increases in mean percentage of spontaneous interaction from baseline to intervention occurred when no comparable changes occurred in Alexa's interactions, it is possible to conclude (very tentatively) that incidental teaching produced direct effects during freeplay activities.

The second question asked, "Will increases in peer interaction occur in the absence of incidental teaching, that is, when children with disabilities are presented with natural opportunities to interact with peers?" The results of

the study suggest that incidental teaching may have produced generalized effects by promoting spontaneous interactions with peers during periods when teachers were not implementing incidental teaching during the freeplay activities. Thus, the increases in SI from baseline to intervention do provide evidence, although admittedly very limited in nature, of moderate generalization effects that took place within a short period of time after direct training had occurred within the same training setting.

Use of the validity checks offer support for the effectiveness of incidental teaching on increasing peer interaction. The teacher demonstrated her ability to implement the components of incidental teaching reliably and consistently on a daily basis. Therefore, when incidental teaching was used, the individual components were implemented as prescribed in the methodology.

Anecdotal records collected by the researcher suggest incidental teaching (with the addition of the aforementioned support strategies) produced the specific social skills needed to foster friendships. During baseline, Juan rarely initiated to peers in the classroom. However, during intervention, he regularly asked a friend to play. Juan learned that he had to stand close to a peer, use a loud voice, and use the peer's first name before the peer would accept his social overture. Moreover, he became more persistent in his efforts

to find a peer with whom he could play. Initially, Juan would give up after a peer rejected his initiation. After a few sessions, though, Juan learned to ask another peer and then another if his initiations were rejected. As the process unfolded, incidental teaching seemed to increase Juan's awareness of peers by providing environmental cues for social interaction. For example, on one occasion, the teacher noted how Juan was interested in a particular toy and asked, "What is missing?", to which Juan smiled and replied, "I need to find a friend". He then asked a nearby friend to play with him. By session 17, midway through the intervention condition, Juan required only minimal prompts and cues to initiate interaction, rather than the full prompts that were predominately used during sessions 12-15. Partial prompts were rarely used by the teacher. Acquisition of social skills such as these are often cited as necessary components of normal social interaction in preschool-aged children (Bierman & Montminy, 1993).

Anecdotal records also indicate that the typical peers were increasingly more comfortable in Juan's presence. Initially, many of the peers were wary of playing with Juan, but as intervention progressed, many of them showed an interest in Juan and invited him to play. Juan eventually played with most of the children in the classroom, but like other children his age, he began to show preferences for some peers over others.

Because intervention could not be replicated on Alexa, a causal relationship between incidental teaching and increases in spontaneous peer interaction could not be demonstrated. Other factors not associated with the intervention could not be ruled out as possible contributing factors to the change in his social behavior. Increases in teacher attention could have potentially served as reinforcement for social behavior. However, the decreases in the amount of concurrent teacher attention indicate that teacher attention probably did not play a major role in the increase in Juan's spontaneous interactions from baseline to intervention. In fact, the teacher was trained to fade her presence from the social interactions that took place between Juan and a peer. Although the mean percentage of concurrent teacher attention also decreased across conditions for Alexa, the daily level of concurrent teacher attention remained highly variable. Also, the very stable, low mean percentages of Alexa's spontaneous interaction add credibility to the conclusion that incidental teaching caused the change in social interaction. Although Juan's average percentage of spontaneous interaction increased substantially from baseline to intervention, his level of interaction was not very stable for that period. One possible explanation for the variability may be found in the method of observation. Because a discontinuous time sampling procedure was used and observers alternated between participants and peers as

they collected data, percentages were based on a limited number of observations per individual. Therefore, the question arises as to whether the number of intervals used in the analysis provided a representative sample of variability in social behavior. However, Doll and Elliott (1994) found that it only requires 5 ten-minute observations across several weeks to obtain a representative sample of preschooler social behavior. The present study consisted of observations that lasted an average of 10 minutes per session over 11 sessions during baseline and 14 sessions during intervention across 10 weeks for the entire study. Hence, the variability in Juan's percentage of spontaneous interaction probably was not the result of a problem with the observation method but rather an accurate reflection of peer interaction that occurred in the classroom setting. This conclusion is further illustrated by the comparison of the percentages of typical peer interaction with those of Juan's interaction percentages (Figure 2). The typical peer percentage of SI represents the mean percentage of interaction for all peers observed for that day. Use of the mean to plot the percentage of SI will reduce the amount of daily and condition variability. The fact that this measure of SI is not very stable suggests that a typical peer in this class also displayed a lot of interaction variability from day to day, similar to Juan. Other research also

has shown similar variability in preschoolers' daily levels of social interaction (Twardosz, et. al., 1983).

Although the mean percentage of spontaneous interaction did increase for outdoor freeplay, the effect does not appear highly significant when depicted graphically (in Figure 5). Although it is possible that Incidental Teaching was not as effective in the outdoor freeplay setting, anecdotal records suggest qualitative changes in Juan's social behavior after incidental teaching was implemented. Juan's percentage of spontaneous interaction was higher during baseline in outdoor freeplay than during indoor freeplay. During baseline, anecdotal records indicate that Juan spent a great deal of time in the sandbox while outdoors. Close contact with peers while inside the sandbox afforded Juan many opportunities to interact with peers. For example, he was often seated with as many as five peers, sometimes used the same equipment. The close proximity to peers often lead to brief instances of sharing or engaging in associative play. However, during intervention Juan was prompted to play outside of the sandbox with a variety of peers within a variety of play contexts. For example, he learned to play catch with a friend, play "Hot Potato" with a group of peers, play tag, and push friends on the swings. Juan's social interactions during intervention involved direct initiations to peers and subsequent play with that peer, while during baseline,

Juan's interactions were more "accidental" in nature, in that they occurred more often due to his location and use of particular play materials.

Another concern with the study involves the ease with which the teacher learned to use effective prompting and cues for social behaviors as components of incidental teaching. The teacher demonstrated skill in identifying the opportunities for incidental teaching and in following the proper sequence of components to implement incidental teaching. However, daily teacher coaching was needed to assist the teacher in creating effective prompts and cues for social skills. Typically, the researcher was present during each session for consulting. Although the teacher who implemented incidental teaching was both experienced and skilled, a great deal of planning and forethought was needed for her to master the complexity of prompting specific social skills. For example, when the teacher noted Juan's interest in Fisher Price people, she first had to find an appropriate cue to gain his cooperation and interest in finding a friend with which to play, such as, "Juan, if you want to play with these little people, how about if you find a friend to help you play tag with them?" Then she would need to identify all of the steps that Juan would need to take in order to initiate to the peer and then prompt him accordingly. For example she might have said to Juan, "I see Lucy sitting close by, go stand next to Lucy and ask her in your loud voice 'Lucy, will you

play tag with the little people with me?'" She would follow up on the prompt by walking with Juan to the child and helping model, if needed, appropriate words and even hand gestures, like a wave in the direction of the play materials indicating, "Come on over here". She would then briefly remain available to the children to help Juan respond to his peer and then she would fade her presence until she decided that Juan once again would benefit from incidental teaching. The incidental teaching episodes were very brief, typically lasting only a few minutes. Therefore, the teacher had to think quickly, using creativity and knowledge of the child's ability to prompt for social behaviors. Although incidental teaching was implemented during freeplay activities, a time when little supervision is needed, the teacher spent most of the freeplay period watching Juan's behavior and looking for opportunities to conduct incidental teaching. Hence, incidental teaching may not be advisable in classrooms were a shortage of teachers exists. However, with greater experience in conducting incidental teaching, the teacher may be able to incorporate this strategy into his/her teaching repertoire, thereby enabling the teacher to naturally become alert to opportunities for conducting incidental teaching with one child and still meet the needs of the other children in the class.

A final concern involves the use of support strategies, outlined in the methodology, to supplement the original incidental teaching strategy. The implication of these modifications is that the intervention employed in this study probably does not represent a "true" incidental teaching procedure like that described in previous research (McGee, et. al., 1992). However, incidental teaching had to be modified from its original framework that was effective in teaching language skills to young children with disabilities; therefore, the present intervention represents an effort to incorporate the components of incidental teaching within a social skills training package. Incidental teaching alone seemed to be effective in training Juan to use appropriate verbal behaviors to initiate to peers. However, to train for more complex social skills that were necessary to facilitate continued social behaviors, support strategies were needed to compliment the incidental teaching intervention. Asking peers if they would be interested in playing with Juan prior to attempting incidental teaching appears to be the only support strategy that may have been associated with an increasing trend in the mean percentage of spontaneous interaction during intervention. However, it is unclear whether the increase in spontaneous interaction occurred due to incidental teaching alone, the implementation of the support strategy, or the coordination of incidental teaching plus the support strategy. Implementation

of the other support strategies during intervention did not appear to significantly effect the mean percentage of spontaneous interaction. Future research is needed to determine to what extent modifications are needed to effectively implement incidental teaching to train for social skills in children with disabilities.

Some of the limitations of this study may be attributable to environmental factors. For example, lower class attendance was problematic for the study, which was conducted over the summer months, because it created a lower pool of children from which Juan could choose to play. Furthermore, by the end of the school year many of the children had developed well-defined play groups within the class. Because Juan attended the preschool less often than most of his peers and was not a member of any of these play groups, many of the peers were initially unwilling to allow Juan into their peer group, therefore his social initiations were sometimes rejected. Another environmental factor that may have influenced the effectiveness of the study was a change in classroom teachers that occurred previous to the onset of data collection. A short period of time was needed to acclimate the children to the new staffing patterns. Finally, a few of the typical peers began to display aggressive behavior and low rates of child engagement also occurred during the baseline condition. These conditions created quite a bit of

stress for both teachers and children. Therefore, reorganization of the classroom environment, including rearrangement the physical space, took place one and one half weeks (around sessions 8 and 9) before intervention began. Upon examination of the data, the environmental change did not appear to have a significant effect on Juan's percentage of spontaneous interaction prior to the start of the intervention. However, a slight increasing trend in spontaneous interaction only during indoor freeplay for the typical peers may be the result of the positive changes that occurred in the environment. The decrease in aggressive behavior, provision of more inviting learning centers and materials, and reduction of teacher stress, all probably contributed to higher levels of positive social behaviors for the classroom peers. As noted earlier, proper arrangement of the environment has been fundamental in implementing incidental teaching. Therefore, the provision of an environment that could sustain and provide for social behaviors was necessary for the implementation of incidental teaching for social skills. The full extent of the effect of the rearrangement of the environment alone on any increases in spontaneous interaction for Juan remains unknown.

Overall, empirical and anecdotal evidence suggests that incidental teaching, in combination with the support strategies used in this study, may be an effective means of promoting social interaction in young children with

disabilities. Therefore, further investigation into its direct and general effects is warranted. A replication of the present study using a multiple-baseline design across a minimum of three subjects should be employed to permit clear conclusions regarding the issue of causality. Conducting studies at times when stable peer attendance is insured and starting incidental teaching toward the beginning of the school year are also advisable. Investigators may want to examine to what extent incidental teaching may have to be modified for effective social skills training. Because incidental teaching was implemented on a child with a mild disability, future research should focus on the effectiveness of incidental teaching on the social skills of children with moderate to severe degrees of disabilities, including a broad range of disabling conditions.

The observation of typical peers in the present study provided valuable comparative information between the interactions of the participants and their peer group. However, future studies also may attempt to collect data on children with disabilities and their peers that reflects the reciprocity of peer interaction. Future investigators may also want to examine how incidental teaching influences the typical peer's perception of children with disabilities. Because durability of the effects of incidental teaching has not been measured, future studies should include follow-up measures of peer interaction after the

discontinuation of intervention. Likewise, measures taken in several settings, activities, and at different times of the day may yield additional information on the general effects of incidental teaching. Because incidental teaching required a great deal of teacher coaching by the researcher, investigators might examine the effectiveness of incidental teaching with child caregivers who have varying levels of education and experience. Finally, future investigations should include comparisons of incidental teaching with other methods of social skills training such as group affection activities to further determine the limitations and strengths of incidental teaching or assess it's use as a supplement to group activities and the corresponding generalization effects. Perhaps group affection activities and incidental teaching in coordination would produce much stronger and durable generalization effects.

In general, the present study indicates that incidental teaching is child-centered, play-based and can be incorporated into everyday freeplay activities with materials that are preferred by the child. Because only child-preferred materials that were found naturally in the classroom were utilized during intervention, incidental teaching utilized a natural community of reinforcers. Because incidental teaching was used at the teacher's discretion, an element of flexibility was instituted within the intervention. Anecdotal records suggest that the teacher was satisfied with incidental teaching and also believed that

Juan's social competence was enhanced because of the intervention. Although no strong causal conclusions can be drawn from either the empirical or anecdotal data, increases in social interaction that occurred during intervention warrant a closer examination of incidental teaching through future studies that are methodologically stronger and planned to occur at a more advantageous time than was possible in the present study.

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# APPENDICES

# APPENDIX A

# OBSERVATIONAL CODING SHEET

Page=_

Observer Name:_____ Date:_____

Activity: _____ Time:_____

Subject:_____

| SI | PrI | NI | SI | PrI | NI | SI | PrI | NI | SI | PrI | NI | SI | PrI | NI | SI | PrI | NI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On | NO | Sm | On | NO | Sm | On | NO | Sm | On | NO | Sm | On | NO | Sm | On | NO | Sm |
| TI | IT | CA | TI | IT | CA | TI | IT | CA | TI | IT | CA | TI | IT | CA | TI | IT | CA |
| T: | | | T: | | | T: | | | T: | | | T: | | | T: | | |
| A: | | | A: | | | A: | | | A: | | | A: | | | A: | | |
| C: | | | C: | | | C: | | | C: | | | C: | | | C: | | |

Child:_____

| SI | PrI | NI | SI | PrI | NI | SI | PrI | NI | SI | PrI | NI | SI | PrI | NI | SI | PrI | NI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| On | NO | Sm | On | NO | Sm | On | NO | Sm | On | NO | Sm | On | NO | Sm | On | NO | Sm |
| TI | IT | CA | TI | IT | CA | TI | IT | CA | TI | IT | CA | TI | IT | CA | TI | IT | CA |
| T: | | | T: | | | T: | | | T: | | | T: | | | T: | | |
| A: | | | A: | | | A: | | | A: | | | A: | | | A: | | |
| C: | | | C: | | | C: | | | C: | | | C: | | | C: | | |

SI= Spontaneous Interaction
NI= Negative Interaction
NO= No Interaction
TI= Teacher Interaction
IT= Incidental Teaching

PrI= Prompted Interaction
On= Onlooker
Sm= Smiling
CA= Caution

T= Toy
A= Area
C= Code

# APPENDIX B

NAME: _____ DATE: _____

| | | TIME | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INCIDENTAL TEACHING COMPONENT | | | | | | | | | | | | | | |
| 1) ID CHILD INTEREST | TOY | | | | | | | | | | | | | |
| | PEER | | | | | | | | | | | | | |
| 2) CUE BEHAVIOR | ATTENTION | | | | | | | | | | | | | |
| | ATTENTION+CUE | | | | | | | | | | | | | |
| 3) PROMPT BEHAVIOR | FULL | | | | | | | | | | | | | |
| | PARTIAL | | | | | | | | | | | | | |
| | MINIMAL | | | | | | | | | | | | | |
| 4) PRAISE RESPONSE | | | | | | | | | | | | | | |
| 5) FADE PRESENCE | | | | | | | | | | | | | | |

NOTES:

# APPENDIX C

Table 1.

Inter-observer agreement percentages for each behavioral code for subject and peers.

| | % Agreement | | |
|---|---|---|---|
| **CODE** | **Juan**<br>**Mean [Range]** | **Alexa**<br>**Mean [Range]** | **Peers**<br>**Mean [Range]** |
| **SI** | 98.2% [87.5% - 100%] | 100% | 96.7% [86.6%-100%] |
| **PrI** | 100% | 100% | 100% |
| **NI** | 100% | 100% | 100% |
| **ON** | 100% | 85.7% [0% - 100%] | 100% |
| **NO** | 95.8% [83.3% - 100%] | 100% | 95.3% [77.7 - 100%] |
| **Sm** | 85.7% [0% - 100%] | 85.7% [0% - 100%] | 75.1% [0% - 100%] |
| **TI** | 99.1% [94.1% - 100%] | 98.9% [92.8% - 100%] | 91.9% [63.6% - 100%] |
| **IT** | 100% | 100% | 100% |
| **CA** | 100% | 100% | 100% |

Table 2.

Mean standard deviation and corresponding ranges of spontaneous interaction from the mean representing the distribution of individual typical peer percentages of spontaneous interaction during baseline and intervention.

**Baseline**

Mean = 47.5% Standard Deviation = 17.9

| SD | Range |
|---|---|
| 1 | 29.6% - 65.4% |
| 1.5 | 20.7% - 74.3% |
| 2 | 11.7% - 83.3% |

**Intervention**

Mean = 49.6% Standard Deviation = 20.7

| SD | Range |
|---|---|
| 1 | 28.9% - 70.3% |
| 1.5 | 18.6% - 80.6% |
| 2 | 8.2% - 90.9% |

Table 3.

Mean percentage of intervals for Juan in which specific behaviors occurred during baseline and intervention conditions.

| | Mean Percentage | |
|---|---|---|
| **Code** | **Baseline** | **Intervention** |
| **SI** | 15.9% | 31.2% |
| **PrI** | .001% | 2.3% |
| **NI** | 0% | 0% |
| **ON** | 1.2% | .008% |
| **NO** | 62.5% | 39.7% |
| **Sm** | 3.9% | 2.3% |
| **TI** | 21.4% | 29.1% |
| **IT** | N/A | 1.6% |
| **CA** | N/A | 0% |

Figure 1. Components of Incidental Teaching.

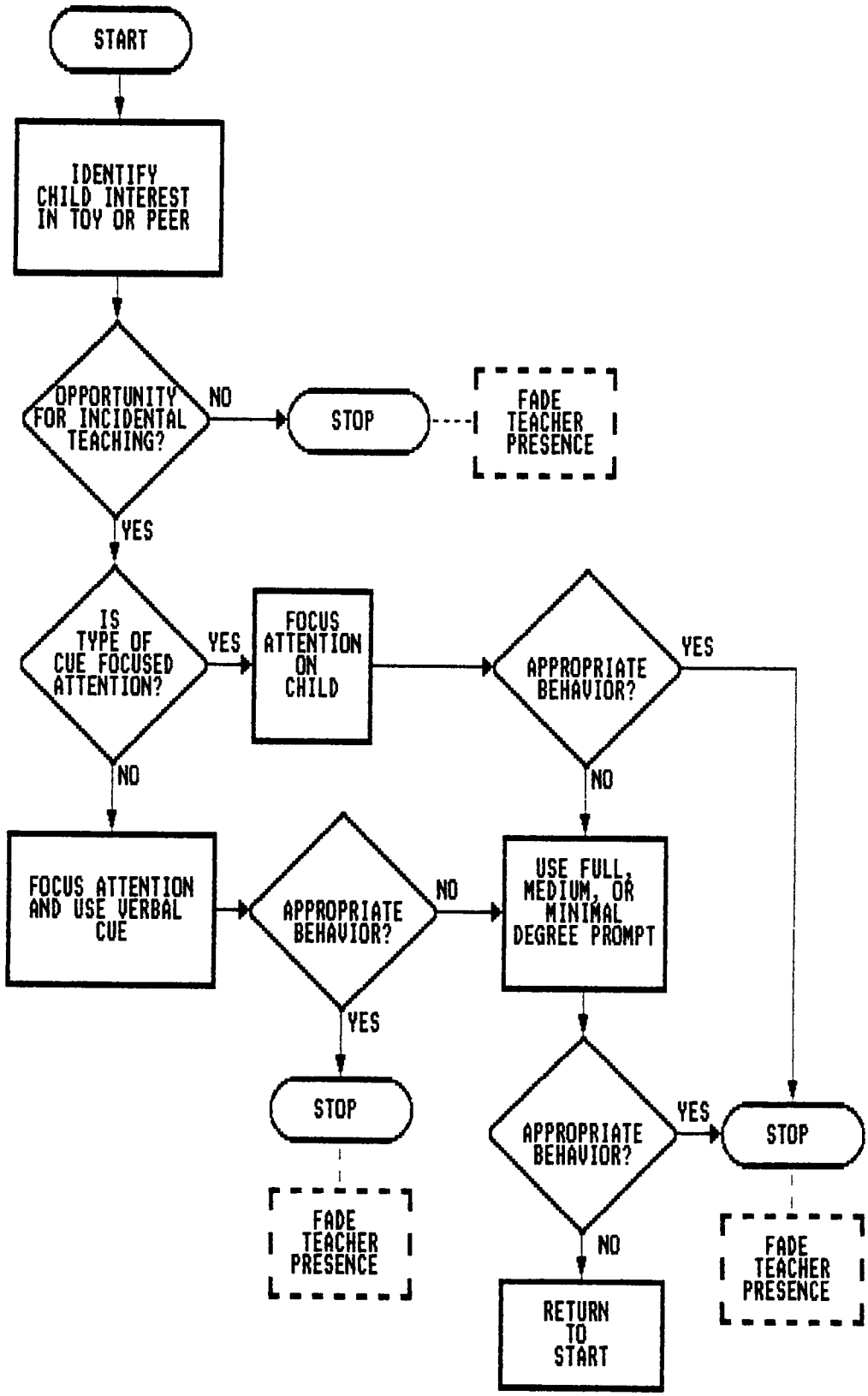

START
IDENTIFY CHILD INTEREST IN TOY OR PEER
OPPORTUNITY FOR INCIDENTAL TEACHING?
NO
STOP
FADE TEACHER PRESENCE
YES
IS TYPE OF CUE FOCUSED ATTENTION?
YES
FOCUS ATTENTION ON CHILD
APPROPRIATE BEHAVIOR?
YES
NO
NO
FOCUS ATTENTION AND USE VERBAL CUE
APPROPRIATE BEHAVIOR?
NO
USE FULL, MEDIUM, OR MINIMAL DEGREE PROMPT
YES
STOP
FADE TEACHER PRESENCE
APPROPRIATE BEHAVIOR?
YES
STOP
FADE TEACHER PRESENCE
NO
RETURN TO START

Figure 2. Spontaneous Interaction for Juan, Alexa, and Typical Peers Across Conditions.

Mean percentages of spontaneous interaction for Juan and typical peers, and Alexa and typical peers during indoor and outdoor freeplay activities. Horizontal lines represent the typical peer range that corresponds to the peer with the highest mean percentage of spontaneous interaction and the peer with the lowest mean percentage of spontaneous interaction during baseline and intervention.

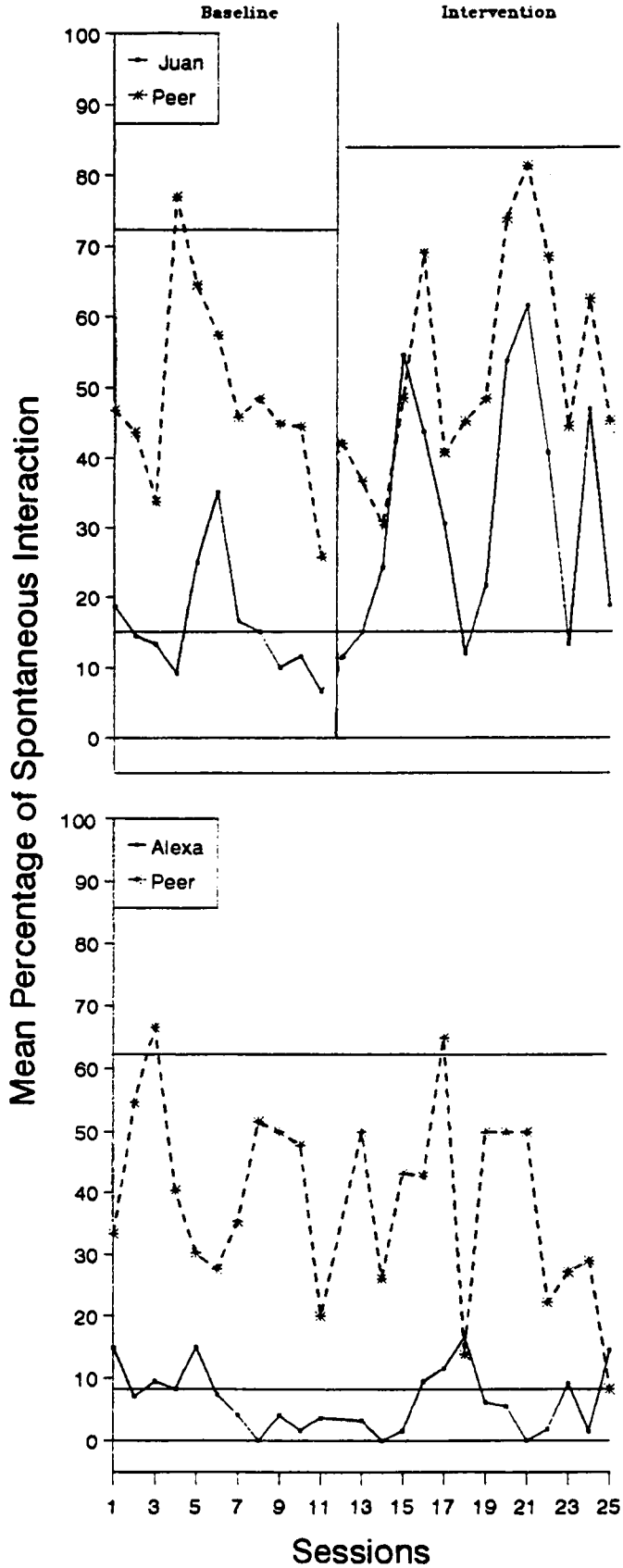

Baseline
Intervention
Juan
Peer
Alexa
Peer
Mean Percentage of Spontaneous Interaction
Sessions
0
10
20
30
40
50
60
70
80
90
100
1
3
5
7
9
11
13
15
17
19
21
23
25

Figure 3. Concurrent Teacher Attention for Juan and Alexa Across Conditions.

Mean percentages of Juan's and Alexa's spontaneous interaction intervals for which concurrent teacher attention occurred during baseline and intervention.

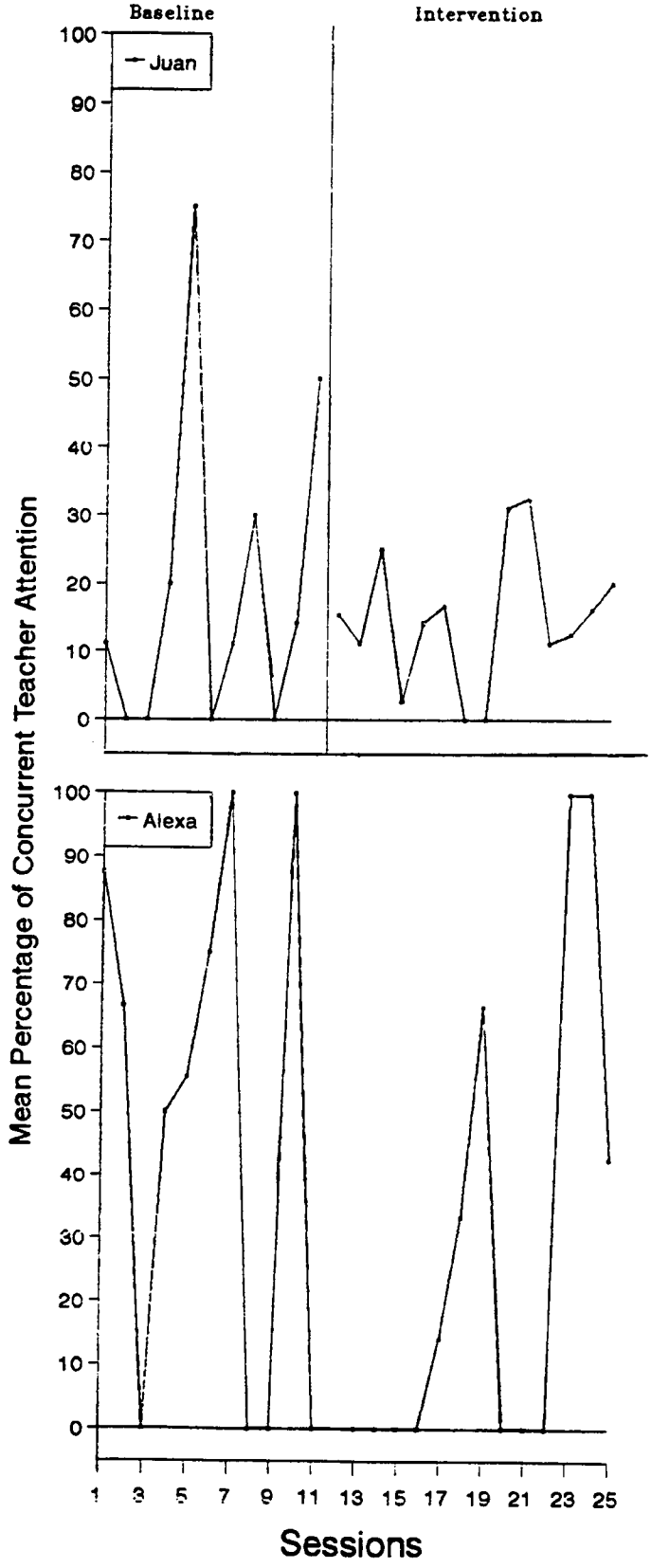

Baseline
Intervention
Juan
Alexa
Mean Percentage of Concurrent Teacher Attention
Sessions
0
10
20
30
40
50
60
70
80
90
100
1
3
5
7
9
11
13
15
17
19
21
23
25

Figure 4. Spontaneous Interaction During Indoor Freeplay.

Mean percentages of spontaneous interaction during indoor freeplay for Juan and typical peers.

Indoor

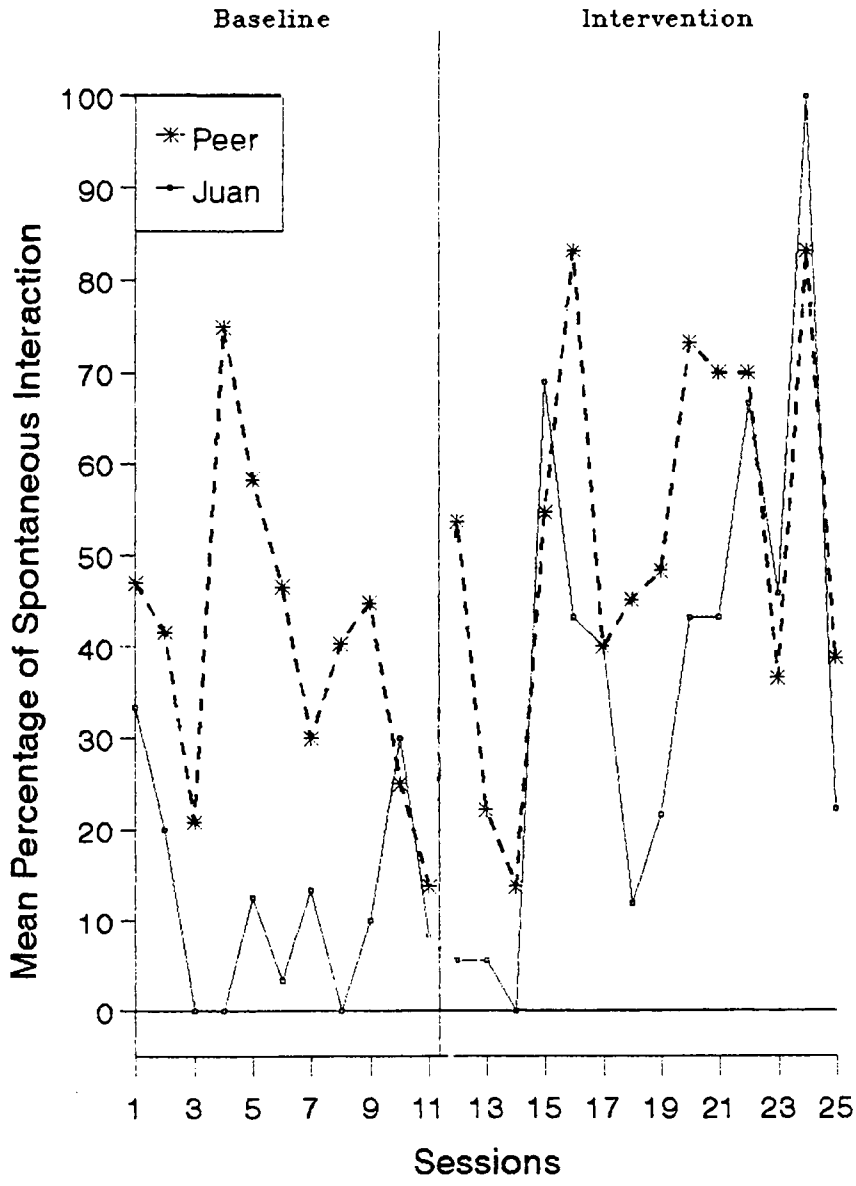
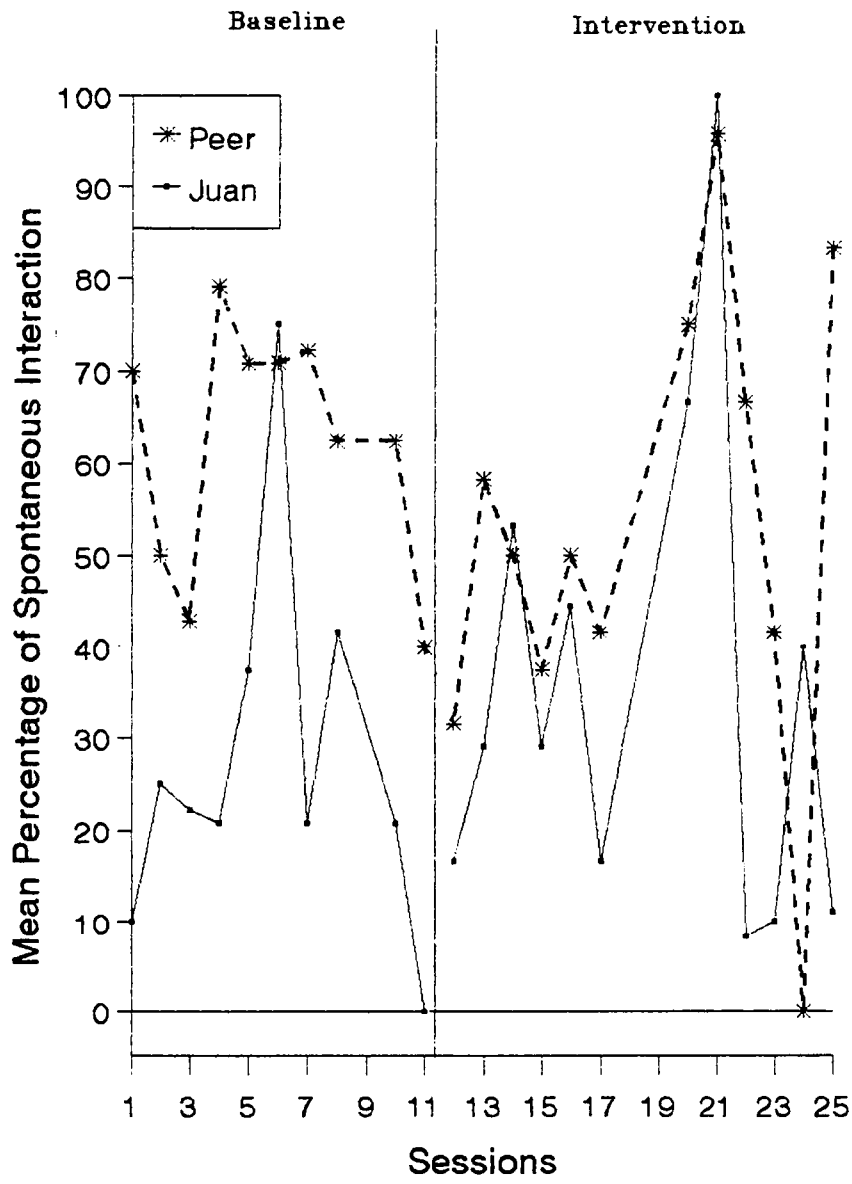

Baseline
Intervention
Peer
Juan
Mean Percentage of Spontaneous Interaction
100
90
80
70
60
50
40
30
20
10
0
1
3
5
7
9
11
13
15
17
19
21
23
25
Sessions

Figure 5. Spontaneous Interaction During Outdoor Freeplay.

Percentages of spontaneous interaction for Juan and typical peers during outdoor freeplay.

Outdoor


Baseline
Intervention
Peer
Juan
Mean Percentage of Spontaneous Interaction
100
90
80
70
60
50
40
30
20
10
0
1
3
5
7
9
11
13
15
17
19
21
23
25
Sessions

## VITA

Lisa Ann Bleattler Kelly was born in Camden, New Jersey, on April 4, 1969 and spent the first 12 years of her life in the suburbs of Philadelphia. Her family then moved to Colonial Heights, Virginia. After finishing high school at Colonial Heights High School in 1987, she attended Virginia Polytechnic Institute and State University, from which she graduated in 1991 with a Bachelor of Science Degree in Family and Child Development. Soon after her marriage to Sean Kelly in 1991, Lisa took a job as home visitor with the New River Community Action Head Start in Christiansburg, Virginia. Upon acceptance into the Master of Science Degree program in Child and Family Studies at The University of Tennessee, Knoxville in 1992, she terminated her employment with Head Start and moved with her husband to Knoxville, Tennessee. During her first two years in the program, she worked in an assistantship as the Administrative Graduate Assistant in the Child Development Laboratories at Cumberland on campus. She is currently working in an assistantship for Tennessee's Early Intervention System and beginning the doctoral program in Human Ecology at UTK.