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Using least-to-most assistive prompt hierarchy to increase chilld compliance with directives in an inclusive preschool classroom

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USING LEAST-TO-MOST ASSISTIVE PROMPT HIERARCHY TO INCREASE CHILD COMPLIANCE WITH DIRECTIVES IN AN INCLUSIVE PRESCHOOL CLASSROOM

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ABSTRACT

Prompt strategies have been used in the literature to increase the compliance of preschool-aged children to teacher directives (Wilder & Atwell, 2006; Wolery & Gast, 1984). The purpose of this study was to train teachers to use guidance/prompt strategies to increase child compliance with teacher directives related to play and social skills. This study builds on the current literature base by using prompting, specifically the least-to-most assistive prompt hierarchy (LtM) (first described by Horner & Keilitz, 1975), with the additional requirement of teacher-child proximity and teacher-child eye level prior to beginning the prompt sequence. These two additional requirements are consistent with recommended practice in early childhood education (Bredekamp & Copple, 1997). The participants consisted of 3 preschool teachers in an inclusive early childhood classroom. Teacher prompts and children's completion of teacher directives were measured during free choice center time. Results were consistent with previous research (Wilder & Atwell, 2006; Wolery & Gast, 1984) in that compliance to teacher directives increased in preschool children with the implementation of the least-to-most assistive prompt hierarchy.

CHAPTER 1. INTRODUCTION

The benefits of early childhood education have been well documented in the literature (Bredekamp & Copple, 1997; DiCarlo, Stricklin, & Reid, 2006; Hart, Charlesworth, & Burts, 1997; McClelland, Morrison, & Holmes, 2000; Wayne, DiCarlo, Burts, & Benedict, 2007). Early childhood classrooms are sometimes children's first experiences in learning to interact with peers and other adults, such as teachers. The early childhood teacher has a variety of responsibilities within the classroom environment; the teacher must organize the environment with materials to facilitate maximum learning experiences, nurture social relationships among peers, and provide guidance to assist children in taking advantage of both of these learning opportunities (Bredekamp & Copple, 1997). Research has shown that a well-designed developmentally appropriate classroom can foster rich learning experiences (DiCarlo, Stricklin, & Reid, 2006; Wayne, DiCarlo, Burts, & Benedict, 2007). Also, research has shown that poor social behavior may have short-term and long-term consequences; studies have indicated that poor social behavior in early childhood can lead to several other problems, such as loneliness and peer rejection, which can persist into adulthood (Buhs & Ladd, 2001; Coie, Terry, Lenox, Lochman, & Hyman, 1995; Cowen, Pederson, Babigian, Izzo, & Trost, 1973; Kupersmidt & Coie, 1990).

Statement of the Problem

For children to benefit maximally from the early childhood environment, they have to take advantage of materials present in the classroom centers, not only exploring materials, but modeling the behavior of both peers and adults (Bredekamp & Copple, 1997). When this does not occur, teachers can facilitate this process using prompts to guide children through these learning experiences (see Wolery & Gast, 1984). Additionally, children have opportunities to

practice a variety of social behaviors with peers, such as greetings, play, and negotiation. When children do not interact with peers or have difficulty in these interactions, teachers can facilitate this process using prompts to guide children through these learning experiences as well (see Wolery & Gast, 1984). Teachers can guide children to learn a variety of developmental skills and behaviors through prompting/coaching and the use of praise/reinforcement.

Background

In early childhood classrooms, children learn to understand others' thoughts, emotions, motives, and intentions through social behaviors such as social negotiation, discussion, and conflict (Hart et. al., 1997). After accomplishing this understanding, children are able to use appropriate and effective social behavior such as negotiation and cooperation (Hart et. al., 1997). These social behaviors can be used to build relationships that can lead to more desirable play and learning opportunities that develop from peer interactions during play.

Young children entering school with poor social skills or inappropriate behaviors tend to experience the additional problem of peer rejection (McClelland, Morrison, & Holmes, 2000). Peer rejection has been documented to have short-term and long-term consequences. Children experiencing peer rejection are often faced with everyday problems such as negative peer treatment, decreased classroom participation, and loneliness (Buhs & Ladd, 2001). Also, children may endure long-term consequences of academic failure, school dropout, adolescent delinquency, psychological difficulties, and psychosocial problems (Hart et. al., 1997). Through longitudinal studies, researchers have demonstrated a link between early peer relationship problems and mental health and criminal issues in adolescence and adulthood (Coie et. al., 1995; Cowen, et. al., 1973; Kupersmidt & Coie, 1990). It is estimated that about half of disordered adults have a history of peer relationship problems (Parker & Asher, 1987).

Research has shown that teacher prompting has been effective in increasing child compliance (Horner & Keilitz, 1975; Parsons & Reid, 1999; Wilder & Atwell, 2006; Wolery & Gast, 1984). Specifically, the least-to-most assistive prompt hierarchy (LtM) has been used to systematically guide children. This prompt hierarchy involves providing increasing amounts of guidance, interdispersed with wait time; the LtM only provides assistance when the child is not able or willing to complete the directive making fading of prompts unnecessary.

Importance of the Area of Research

Because young children exhibiting poor social skills may experience long-term consequences, it is important to investigate an effective intervention that teachers can use to guide children through engaging learning opportunities with both the environment and peers in the early childhood classroom. Through training, research has shown that teachers can incorporate guidance into their typical classroom routine to teach children new skills successfully (Wilder & Atwell, 2006).

Purpose of the Study

The focus of this investigation was on training teachers to use guidance/prompt strategies to increase child compliance with teacher directives related to play and social skills. The teacher will provide guidance in the form of prompting to assist children to complete directives related to engagement with materials in the environment (play) and/or social behavior with peers. This investigation applies previously used prompting interventions that are well documented in the literature (Parsons & Reid, 1999; Wilder & Atwell, 2006; Wolery & Gast, 1984) to promote child compliance within naturalistic environments, such as the early childhood classroom.

The potential contribution of this study was to demonstrate that effective prompting could be used within the naturally occurring routine of the early childhood classroom. The specific

purposes were to determine if teachers could learn to use the LtM and if child compliance would increase in response to teacher behavior.

Research Questions

Prompt strategies have been used in the literature to increase the compliance of preschool-aged children to teacher directives (Wilder & Atwell, 2006; Wolery & Gast, 1984). This study builds on the current literature base by using prompting, specifically LtM (first described by Horner & Keilitz, 1975), with the additional requirement of teacher-child proximity and teacher-child eye level prior to beginning the prompt sequence. These two additional requirements are consistent with recommended practice in early childhood education (Bredekamp & Copple, 1997). Specifically, the research questions for this study are: (a) Can teachers learn to use the least-to-most assistive prompt hierarchy?; (b) Will children increase compliance in response to teacher behavior?

Conceptual Framework

Principles of Reinforcement. B.F. Skinner (1987) studied behavior, and he concluded that consequences remit responses. Meaning that, teacher behavior can impact child responses. Skinner focused on shaping behavior and developed a behavioral model called *operant conditioning.* Operant conditioning shapes behavior through reinforcement. Teachers can use praise as reinforcement to shape child behavior. Skinner's research suggests that punishment is ineffective and leads to short-term changes in behavior; however, he concluded that reinforcement achieves long-term changes in behavior. Rather than using time-out or other punishment when a child does not behave appropriately, teachers can use guidance strategies to assist children through appropriate interactions and praise to reinforce desirable behaviors. The National Association for the Education of Young Children (NAEYC- Bredekamp & Copple,

1997) recommends allowing children opportunities to be engaged in their environment. In this study, teachers can support this recommendation by using effective prompting paired with the reinforcement (praise) to increase children's compliance with teacher directives, which may lead to more engagement with the environment and peers.

Experimental Design

A single-subject research design was used to record teacher behavior and child behavior in response to prompting. In contrast to quantitative studies, which sample large numbers of individuals prior to and following an intervention (Snedecor & Cochran, 1989), single-subject research designs examine the performance of individuals before and during an intervention. In this study, teacher behavior (prompts) and child behavior (completed directives) were examined before and during the LtM intervention and again during a follow-up probe. In single-subject designs, individuals are compared to themselves instead of to other groups (Alberto & Troutman, 2006). In this study, each teacher's baseline level of prompting and child completion of directives was compared to their level of prompting and child completion of directives when the LtM was implemented. Experimental control is demonstrated by implementing the intervention across settings, people, or behavior at different periods in time and receiving the same outcome (Cooper, Heron, & Heward, 1987). This study focused on implementing the LtM intervention across teachers and looking at its effect on completion of child directives.

Single-subject research designs rely on clinical significance rather than statistical significance. The results of a study are said to have clinical significance if the intervention of the design shows an enhanced functioning, which is defined as an observable and measurable improvement in functioning for participants (Alberto & Troutman, 2006).

Single-subject research is beneficial because it answers applied research questions and consists of direct observations of performance. Researchers are able to focus on specific behaviors and provide treatment or intervention for the specific behaviors. In single-subject research, experimental control is exhibited by continuous assessment over time, which can be used to draw inferences about the effects of the intervention. Single-subject designs also evaluate the subject's behavior under different conditions, which allows the subject to serve as their own control (Kazdin, 1982).

A multiple baseline design (see Kazdin, 1982) was used to measure the LtM intervention across teachers. The LtM intervention was introduced to each teacher separately. Teacher behavior (prompts) was changed to determine if children's behavior (completed directives) changed when the LtM intervention was implemented.

Limitations

There are several problems and limitations that should be acknowledged when using a multiple-baseline design. Single-case research demonstrates high internal validity when carefully designed. There are several threats to internal validity that have been identified (history, maturation, testing, instrumentation, diffusion of treatment), which could account for changes in the independent variable (Kazdin, 1982). Each must be ruled out before stating that a study is internally valid. An external event (history) may coincide with intervention, such as a family crisis. The subject may mature, thus acquiring new behavior by nature of growing older or stronger with time, independent of the intervention. A subject may learn through repeated testing using a specialized assessment. There may be a change in the data based on changes in the observer's scoring, rather than in the subject's performance (instrumentation). Additionally, the

intervention procedures may not be properly adhered to (diffusion of treatment) across conditions.

Although the goal of single-case experimental research is to demonstrate a relationship between the independent and dependent variables, applied research also seeks to generalize these results beyond the experimental condition. External validity is the degree to which results can be generalized beyond experimental conditions. As with internal validity, there are several threats to external validity that must be considered. The first is whether the effects of the intervention will generalize to other subjects. Another threat to external validity is the ability to generalize across different settings, change agents, and times (Kazdin, 1982).

Assumptions

The following assumptions guide the study:

1. Appropriate social behavior as defined in the study is a desirable outcome for American children.
2. The instruments that are used in the study are appropriate for measuring the variables of interest in preschool children.
3. The data collected in the study is valid and reliable.
4. The classroom environment is developmentally appropriate.

CHAPTER 2. REVIEW OF LITERATURE

Early childhood teachers have the responsibility to organize the environment with materials to facilitate maximum learning experiences, nurture social relationships among peers, and provide guidance to assist children in taking advantage of both of these learning opportunities (Bredekamp & Copple, 1997). Previous research has suggested that teachers should make every attempt to craft a well-designed, developmentally appropriate classroom in order to foster rich learning experiences (DiCarlo, Stricklin, & Reid, 2006; Wayne, DiCarlo, Burts, & Benedict, 2007). The literature has highlighted both the short-term and long-term consequences of poor social behavior of preschool-aged children; these studies have identified problems, such as loneliness and peer rejection, which can persist into adulthood (Buhs & Ladd, 2001; Coie et. al., 1995; Cowen, et. al., 1973; Kupersmidt & Coie, 1990).

The review of literature is organized across major topics related to the study. The review of literature consists of learning through social interactions, teacher interventions, and the benefits of intervention in preschool.

Learning through Social Interactions

Children learn appropriate social behavior through social interactions (Campbell, 2002). Through social interaction, children quickly learn what is socially acceptable and what is socially unacceptable. In most developmentally appropriate classrooms, children learn to work through conflicts by stating the problem, identifying solutions, and implementing a solution that is agreed upon by all parties (Hart et. al., 1997). Through peer conflict resolution and other interactions, children learn to understand others (Hart et. al., 1997). After developing an understanding of others, children are able to use appropriate and positive social behavior (Hart et. al., 1997).

Previous studies have provided evidence that reveals the negative effects of poor social behavior (Buhs & Ladd, 2001; Coie et. al., 1995; Cowen, et. al., 1973; Hart et. al., 1997; Kupersmidt & Coie, 1990; McClelland, Morrison, & Holmes, 2000; Parker & Asher, 1987). Studies have revealed short-term consequences from poor social behavior, but more importantly, studies have shown long-term consequences from poor social behavior in early childhood (Buhs & Ladd, 2001; Coie et. al., 1995; Cowen, et. al., 1973; Hart et. al., 1997; Kupersmidt & Coie, 1990; McClelland, Morrison, & Holmes, 2000; Parker & Asher, 1987).

Young children entering school with poor social skills or behaviors tend to experience other problems including peer rejection, behavior problems, and low levels of academic success (McClelland, Morrison, & Holmes, 2000). Through longitudinal studies, researchers believe that there is a link between early peer relationship problems and mental health and criminal issues in adolescence and adulthood (Coie et. al., 1995; Cowen, et. al., 1973; Kupersmidt & Coie, 1990). About half of disordered adults have a history of peer relationship problems (Parker & Asher, 1987).

The behaviors children display in peer interactions influence their acceptance by the peer group. Higher levels of cooperative play and social conversation are positively related to peer status. When children are accepted by their peer group, more opportunities for play can occur. Learning new skills can happen through this interaction. Arguing, aggression, and rough play are negatively related to peer status. Peer rejection is a predictor of academic failure, school dropout, adolescent delinquency and psychological difficulties such as anxiety or depression. Children who are rejected by their peers due to aggressiveness or other forms of inappropriate behavior tend to have later psychosocial adjustment problems (Hart et. al., 1997). Additionally, when children are rejected they miss opportunities to learn new skills from their peers.

Other studies have suggested associations with early behavior and future behavior (Coie et. al., 1995; Cowen, et. al., 1973; Kupersmidt & Coie, 1990; Wong et. al. et. al., 2006). According to a previous study (Wong et. al., 2006), behavior control, which is defined as the ability to control impulses and behavior, and resiliency, which is defined as the flexibility to adapt self control to environmental demands, may predict the later use of alcohol and drugs. Children with lower levels of behavioral control at ages 3 to 5 and those with behavioral levels that increased at a slower rate over time were more likely to drink at an early age, to report having been drunk, to have more alcohol-related problems, and to have used other drugs. Adolescents with higher resiliency in early childhood were less likely to start drinking at an early age.

A second study conducted suggested that children with behavioral problems at an early age may experience mental health problems later in life. Children with early behavioral problems also seemed to be at risk of criminality later in life (Coie et. al., 1995; Cowen, et. al., 1973; Kupersmidt & Coie, 1990).

Also, some evidence suggests that untreated behavior problems worsen over time. As the behavior becomes more difficult to manage, there is a possibility that more restrictive interventions may need to be implemented, and the individual may be exposed to greater risks (Hunt & Johnson, 1990).

Because young children exhibiting inappropriate behaviors, such as noncompliance, may experience negative long-term consequences, it is important to investigate an effective strategy that may increase appropriate behaviors, such as compliance. As a preventative strategy, poor social behavior needs to be addressed during the early childhood years through intervention.

Teacher Interventions

Prompt strategies have been described in the literature and have been used to increase the compliance of preschoolers in response to teacher directives (Wilder & Atwell, 2006; Wolery & Gast, 1984). The current study builds on the foundation of current literature by using prompting, specifically a LtM (Horner & Keilitz, 1975), with the additional requirements of teacher-child proximity and teacher-child eye level prior to beginning the prompt sequence. These two prerequisites are consistent with recommended practice in early childhood education (Bredekamp & Copple, 1997).

Several studies suggest that child compliance may be increased through reinforcement (Lalli & Vollmer, 1999; Wilder et. al., 2007, Wilder & Atwell, 2006). Lalli and Vollmer (1999) studied the effects of positive reinforcement and negative reinforcement. The participants of the study varied in age and included a 3 year old. The participants were given a positive or negative reinforcer in response to their escape-maintained problem behavior. When positive reinforcement was given, compliance increased and problem behavior decreased for all participants.

Wilder et. al. (2007) used a functional analysis to increase child compliance. The participants were two typically developing preschoolers that were reported as ignoring the teacher's instructions and noncompliant. Differential reinforcement was used as an intervention. Each child was given a coupon that could be exchanged for a preferred activity (without interruption). The results of the study suggest that compliance increased with the implementation of differential reinforcement.

Wilder & Atwell (2006) used differential reinforcement and guided compliance (prompting) in an attempt to increase compliance. A coupon method and a least-to-most prompt

system were administered to six typically developing preschoolers. When the least-to-most prompt system was implemented, compliance increased for four of the six children. When differential reinforcement was implemented, compliance increased for the remaining two participants.

The previously mentioned studies have suggested that child compliance among preschool children may be increased through intervention. Assessment was conducted before and during an intervention in most of the studies, and the interventions from each study suggested positive effects on child compliance. It is necessary for children to comply to teacher directives because it allows children to effectively interact with their environment and peers, and it maximizes rich learning experiences.

Benefits of Intervention in Preschool

As previously stated in the above-mentioned studies, interventions have been used to increase child compliance. These interventions have been beneficial, allowing optimal opportunities for children to engage in their environment and effectively interact with their peers. However, if children lack social skills and are not able to effectively interact with their peers, children may experience peer rejection (McClelland, Morrison, & Holmes, 2000) and other problems associated with peer rejection (Buhs & Ladd, 2001; Coie et. al., 1995; Cowen, et. al., 1973; Kupersmidt & Coie, 1990). It is the teacher's responsibility to intervene and guide children through these experiences in order for children to learn these important social skills.

The literature indicates that intervention benefits children that exhibit poor social behavior in early childhood. Without early intervention, poor social behavior may lead to more severe problems (Webster-Stratton et. al., 2004; Hunt & Johnson, 1990; Reynolds, Mann,

Miedel, Smokowski, 1997; New Freedom Commission on Mental Health, 2003; Shonkoff & Phillips, 2000).

Evidence suggests that without intervention, behavioral problems (i.e. aggression, oppositional behavior, or conduct problems) in young children may become an evident pattern of behavior by 8 years of age, which can lead to other problems such as academic problems, school dropout, substance abuse, delinquency, and violence. By treating aggressive behavior when the child's behavior is more adaptable (prior to age 8), the progression of the behavior is disturbed and a change in behavior is more likely to occur (Webster-Stratton et. al., 2004).

Also, there is evidence that interventions can generate long-term effects. A study analyzed several early intervention programs (Reynolds et. al., 1997). The study suggests that intervention programs can produce long-term positive effects on school achievement, special education placement, grade retention, disruptive behavior, and school dropout.

Recent research on the importance of emotional and social well-being in school readiness and the negative paths that result from early problem behavior has gained national attention (New Freedom Commission on Mental Health, 2003; Shonkoff & Phillips, 2000). National focus has turned to the importance of providing prevention and intervention services to young children with challenging behavior because of the critical role it serves in young children's lives. Intervention may prevent the problem from escalating and may eliminate future risks for children (Hunt & Johnson, 1990).

Because there seem to be associations with early behavior and future behavior, it is essential for teacher's to intervene early to eliminate higher risks for children later in life. In order to overcome short and long-term consequences and decrease the risk of the behavior worsening over time, it is necessary for teachers to provide intervention that can guide children

through engaging learning experiences with both peers and the environment in the early childhood classroom.

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CHAPTER 3. METHOD

Setting

This study was conducted in an inclusive, four day a week, half-day program that served 18 three- and four-year old children, with equal amounts of males and females. There were 16 typically developing children and 2 children with identified special needs in the program. The classroom staff included a lead teacher, two graduate assistants, and two student teachers. The program was accredited by the National Association for the Education of Young Children. It was organized into the following nine interest areas: table toys and games, blocks, discovery, reading, art, music, dramatic play, computer, and writing. The classroom used a project approach based on the children's interest, and materials were rotated regularly.

Participants

This study focused on the behavior of the teachers in the preschool classroom. One graduate assistant (referred to as Teacher One) and the two student teachers (referred to as Teacher Two and Teacher Three) were observed interacting with the children. Teacher One was Caucasian and had a Bachelor of Science in special education. Teacher One was working toward a master's degree in early childhood education. Teacher Two and Teacher Three were both Caucasian and third-year undergraduate students working towards a bachelor's degree in pre-kindergarten to third grade certification. The three teachers were observed interacting with various children enrolled in the program (see *Setting*). The three teachers had no prior experience working in a preschool setting, and each had been working with the current group of children for one week at the beginning of the study.

Behavior Definitions

Teacher Behavior. Teacher behaviors of interest are the prompts that the teachers give children, which, in a specific sequence, comprise the LtM intervention. *Teacher prompts* were defined as the teacher's verbal, model, or physical cue given to a child to complete a task related to interacting appropriately with materials or with a peer. A *verbal prompt* was defined as any directive statement told to the child by the teacher. An example of a verbal prompt was the teacher telling a child, "Gentle, move the paint brush up and down" or "You need to give that back to her." A *model prompt* was defined as the teacher demonstrating the desired behavior. An example of a model prompt from the above-mentioned verbal directives was for the teacher to model moving the paint brush up and down. When it was not appropriate or possible for the teacher to model the desired behavior, the teacher proceeded from a verbal prompt directly to a physical prompt. A *physical prompt* was defined as the teacher physically helping the child complete the task. An example of a physical prompt from the above-mentioned verbal prompts was the teacher physically assisting the child to give a toy back to the peer. *No directive given* was defined as the teacher never issuing a directive to any child.

Other aspects of teacher behavior were also recorded: (a) teacher proximity to the child; (b) teacher-child eye level; (c) teacher praise toward the child. *Teacher proximity* was defined as the teacher being within arm's reach of the child; when prompting, *eye level* was defined as the teacher being on the child's eye level. A *praise statement* was defined as any encouraging statement that acknowledged the child's completed directive. An example of a praise statement was the teacher telling a child (after completing a directive), "You moved the paint brush up and down!" or "Thank you for giving the toy back to her."

Child Behavior in Response to Teacher Prompts. A *completed directive* was defined as a completed action performed in response to a teacher prompt within 3-5 seconds. A *not completed directive* was defined as an action not performed in response to a teacher prompt within 3-5 seconds. An example of a task that would have been recorded as *not completed* would have been when a child was told to move the paint brush up and down, and one of the following events occurred: (a) the child walked away from the art easel; (b) the child continued to beat the paint brush on the easel, ignoring the teacher directive; (c) the teacher gave another verbal prompt (not paired with a model or physical prompt).

Procedures

Observation System. Event recording is a method used to tally or count behaviors as they occur (Cooper, Heron, & Heward, 1987). Researchers use event recording because it does not interfere with continuous activities; it is easy; and it always produces numerical products (Cooper et. al., 1987). Event recording was used in this study to allow the researcher to continue with the naturally occurring classroom routine. However, a limitation of event recording is that the researcher may not capture every behavior; some behaviors may be overlooked (Kazdin, 1982).

Each teacher was observed interacting with children for 10-minute observation sessions during free choice center time over the course of 3 weeks (not including follow-up). Behavior was recorded continuously over each 10-minute session. One to two data points (sessions) were recorded for each teacher in a given day; when more than one data point (session) was recorded, there was at least 15-20 minutes between observation sessions. There were a total of 18 observation sessions across baseline, intervention, and follow-up. Events were arranged on a minute-by-minute basis for reliability purposes (see **Interobserver Reliability**). Event

recording was used to record the teacher's behavior and the child's behavior in response to the teacher's prompt. An event was defined as a teacher providing any directive to a child; specifically, a directive event began when the teacher under observation gave any prompt to a child and ended when one of the following occurred: (a) the child completed the task within five seconds; (b) the child did not complete task within 5 seconds; (c) the teacher under observation issued a new or repeated verbal prompt.

For this study, the data sheet shown in Appendix C was constructed for data collection. Each defined behavior (teacher-child proximity, teacher-child eye level, verbal prompt, model prompt, physical prompt, praise statement, completed directive, and not completed directive) was placed in a square that was divided into 8 small boxes. A code for each of the 8 defined behaviors was inserted into each box (AR = arm's reach, EL= eye level, V = verbal, M = model, PH = physical, PR = praise, C = completed, NC = not completed). Each behavior was coded as present or absent by putting a tally mark through the code. Each large square comprised one event. *No directive given (NDG)* was tallied for each minute when the teacher under observation did not issue any directives to any child. Notes were taken on characteristics of the event and the child involved in the event. One data sheet was used per teacher per session for all observations.

The observers included two graduate students who were trained with written instructions and example scenarios until each reached 80% agreement (Kazdin, 1982) with the primary researcher. The observers reviewed the instructions with the primary researcher before conducting the observation sessions. This study occurred over 3 weeks (not including follow-up) and consisted of 3 phases (baseline, LtM intervention, and follow-up).

Study Phases

Phase 1: Baseline. Teachers were not given any instructions regarding their behavior in the classroom. The purpose of collecting baseline data was to determine current teacher behavior and current child behavior in response to teacher directives. Teacher prompts and child completion of teacher directives were measured. The researchers observed the teachers interacting with the children until a stable pattern of behavior was observed (Kazdin, 1982). Teacher One was observed for 4 sessions during baseline; Teacher Two was observed for 4 sessions during baseline; and Teacher Three was observed for 7 sessions during baseline.

Phase 2: Least-to-Most Assistive Prompt Hierarchy Intervention. A system of least-to-most assistive prompts (Parsons & Reid, 1999; Wilder & Atwell, 2006; Wolery & Gast, 1984; Wolery & Wilbers, 1994) was implemented contingent on the child's completion of a teacher's directive. The teacher provided prompts through completion of the directive and praised verbally for correct responding. Consistent with guidelines for least-to-most prompting, teachers allowed a wait time (Snell & Brown, 2000; Wilder & Atwell, 2006; DiCarlo, Reid, & Stricklin, 2003) of 5 seconds between each level of prompting. This prompt hierarchy has a built-in fade procedure; successive prompts were provided only if the child did not complete the directive with the previous prompt.

The LtM consisted of the following 8 step sequence: (a) teacher-child proximity; (b) teacher- child eye level; (c) issue a verbal request; (d) wait 3-5 seconds for a response; (e) if not completed, issue the verbal request again paired with a model; (f) wait 3-5 seconds for a response; (g) if not completed, issue the verbal request again paired with physical assistance to task completion; (h) praise completion (steps c-h based on Horner & Keilitz, 1975; Parsons & Reid, 1999; Wilder & Atwell, 2006). The first two steps (teacher-child proximity and teacher-

child eye level) were added because each is considered a recommended early childhood practice by the NAEYC (Bredekamp & Copple, 1997). Teachers were given the above instructions in written form; the behavior definitions and example scenarios were discussed prior to implementing the intervention.

Table 1
Steps in the LtM Intervention

(a) teacher-child proximity
(b) teacher- child eye level
(c) issue a verbal request
(d) wait 3-5 seconds for a response
(e) if not completed, issue the verbal request again paired with a model;
(f) wait 3-5 seconds for a response
(g) if not completed, issue the verbal request again paired with physical assistance to task completion
(h) praise completion

During the observation sessions, the researcher coached the teachers through the LtM. This coaching procedure was used to preserve treatment integrity; that is, that the intervention was implemented as written (Cooper, Heron, & Hewing, 1987; Kazdin, 1982; Wilder, Atwell, & Wine, 2006). An event was scored as correctly prompted when the teacher followed the above-mentioned steps of the LtM in order. An event was scored as incorrectly prompted when the teacher did not follow the steps of the LtM in order. For example, if the teacher immediately used physical assistance, the event was scored as incorrectly prompted. An event was also scored as incorrectly prompted if the teacher was not within arm's reach of the child (teacher-

child proximity), was not on the child's eye-level (teacher-child eye level), or did not praise completion. Because the LtM states that increasing amounts of assistance are given, an event was scored as correctly prompted even if a model prompt was not provided (the teacher moved directly from a verbal prompt to a verbal paired with physical assistance). Teacher One was observed for 9 sessions during intervention; Teacher Two was observed for 6 sessions during intervention; and Teacher Three was observed for 3 sessions during intervention.

Phase 3: Follow-Up. A follow-up data point was taken on each teacher approximately 2 weeks after intervention ceased. Teachers were not given any instructions, review, or coaching. Each teacher was observed for a 10-minute session during free choice play center time.

Interobserver Reliability

Interobserver agreement refers to the evaluation of how well the data from separate observers correspond (Cooper, Heron, & Heward, 1987; Kazdin, 1982). It is generally assumed that if observers record the same behavior, their data probably reflects the actions of the participants (Kazdin, 1982). It is recommended that reliability checks be conducted throughout all phases of the study on at least 20% of the observation sessions with interobserver agreement of 80% or higher (Cooper, Heron, Heward, 1987; Kazdin, 1982).

Interobserver agreement checks were conducted during 19% of all observation sessions, across baseline, during the LtM intervention conditions, and follow-up. Agreements were recorded when observers recorded the same prompt, whereas disagreements were recorded when the observers recorded different prompts. Events on the data sheet were organized in a minute-by-minute format for reliability purposes. Because events were organized in a minute-by-minute format, this allowed a more stringent method of reliability to be calculated. Interobserver agreement was determined on a minute-by-minute basis for overall agreement, occurrence

agreement, and nonoccurrence using the formula of number of agreements divided by number of agreements plus disagreements multiplied by 100%. For correct prompts for Teacher One, overall agreement averaged 89% (range, 67-100%), occurrence agreement averaged 89% (range, 67-100%), and nonoccurrence agreement averaged 83% (range, 50-100%). For correct prompts for Teacher Two, overall agreement, occurrence agreement, and nonoccurrence agreement all averaged 100%. For correct prompts for Teacher Three, overall agreement, occurrence agreement, and nonoccurrence agreement all averaged 100%.

For completed directives for Teacher One, overall agreement averaged 100%, occurrence agreement averaged 100%, and nonoccurrence agreement averaged 100%. For completed directives for Teacher Two, overall agreement, occurrence agreement, and nonoccurrence agreement all averaged 100%. For completed directives for Teacher Three, overall agreement, occurrence agreement, and nonoccurrence agreement all averaged 100%.

Experimental Design

A single-subject research design was used to record teacher behavior and child behavior in response to prompting. In contrast to quantitative studies, which sample large numbers of individuals prior to and following an intervention (Snedecor & Cochran, 1989), single-subject research designs examine the performance of individuals before and during an intervention. In this study, teacher behavior (prompts) and child behavior (completed directives) were examined before and during the LtM intervention and again during a follow-up probe. In single-subject designs, individuals are compared to themselves instead of to other groups (Alberto & Troutman, 2006). In this study, each teacher's baseline level of prompting and child completion of directives was compared to their level of prompting and child completion of directives when the LtM was implemented. Experimental control is demonstrated by implementing the intervention

across settings, people, or behavior at different periods in time and receiving the same outcome (Cooper, Heron, & Heward, 1987). This study focused on implementing the intervention across teachers and looking at its effect on completion of child directives.

Single-subject research designs rely on clinical significance rather than statistical significance. The results of a study are said to have clinical significance if the intervention of the design shows an enhanced functioning, which is defined as an observable and measurable improvement in functioning for participants (Alberto & Troutman, 2006- see **Results**).

Single-subject research is beneficial because it answers applied research questions and consists of direct observations of performance. Researchers are able to focus on specific behaviors and provide treatment or intervention for the specific behaviors. In single-subject research, experimental control is exhibited by continuous assessment over time, which can be used to draw inferences about the effects of the intervention. Single-subject designs also evaluate the subject's behavior under different conditions, which allows the subject to serve as their own control (Kazdin, 1982).

A multiple baseline design (see Kazdin, 1982) was used to measure the LtM intervention across teachers. The LtM intervention was introduced to each teacher separately. Teacher behavior (prompts) was changed to determine if children's behavior (completed directives) changed when the LtM intervention was implemented.

CHAPTER 4. RESULTS

This study examined the effect of changing teacher behavior (prompts) through the LtM intervention in an attempt to change children's behavior (completed directives). Specifically, the study examined the percentage of correct teacher prompts and the percentage of children's completed directives before and during the LtM intervention. Percentages were calculated by dividing the number of each behavior (teacher prompts or children's completed directives) by the total number of events and multiplied by 100. Results are presented for each teacher across baseline and intervention as shown in Figure 1. Sessions represent a 10-minute observation period and are depicted chronologically on Figure 1.

As indicated in Figure 1, during baseline, correct teacher prompts and completed child directives varied for each teacher. When the LtM intervention was implemented, correct teacher prompts and completed child directives increased for all teachers.

During baseline for Teacher One, *correct prompts* averaged 4% (range, 0-17%) and children's *completed directives* averaged 37% (range, 0-50%) of observation intervals. During intervention for Teacher One, *correct prompts* averaged 80% (range, 50-100%), which was a 76% increase; children's *completed directives* averaged 94% (range, 75-100%), which was a 57% increase. During follow-up for Teacher One, *correct prompts* and children's *completed directives* averaged 100%.

During baseline for Teacher Two, *correct prompts* averaged 0%, and children's *completed directives* averaged 50% (range, 50-50%) of observation intervals during baseline. During intervention for Teacher Two, *correct prompts* averaged 93% (range, 75-100%), which was a 93% increase; children's *completed directives* averaged 96% (range, 75-100%), which was

a 46% increase. During follow-up for Teacher Two, *correct prompts* and children's *completed directives* averaged 100%.

During baseline for Teacher Three, *correct prompts* averaged 4% (range, 0-25%) and children's *completed directives* averaged 50% (range, 33-75%) of observation intervals during baseline. During intervention for Teacher Three, *correct prompts* averaged 89% (range, 66-100%), which was an 85% increase; children's *completed directives* averaged 100% (range, 100%), which was a 50% increase. During follow-up for Teacher Three, *correct prompts* and children's *completed directives* averaged 100%.

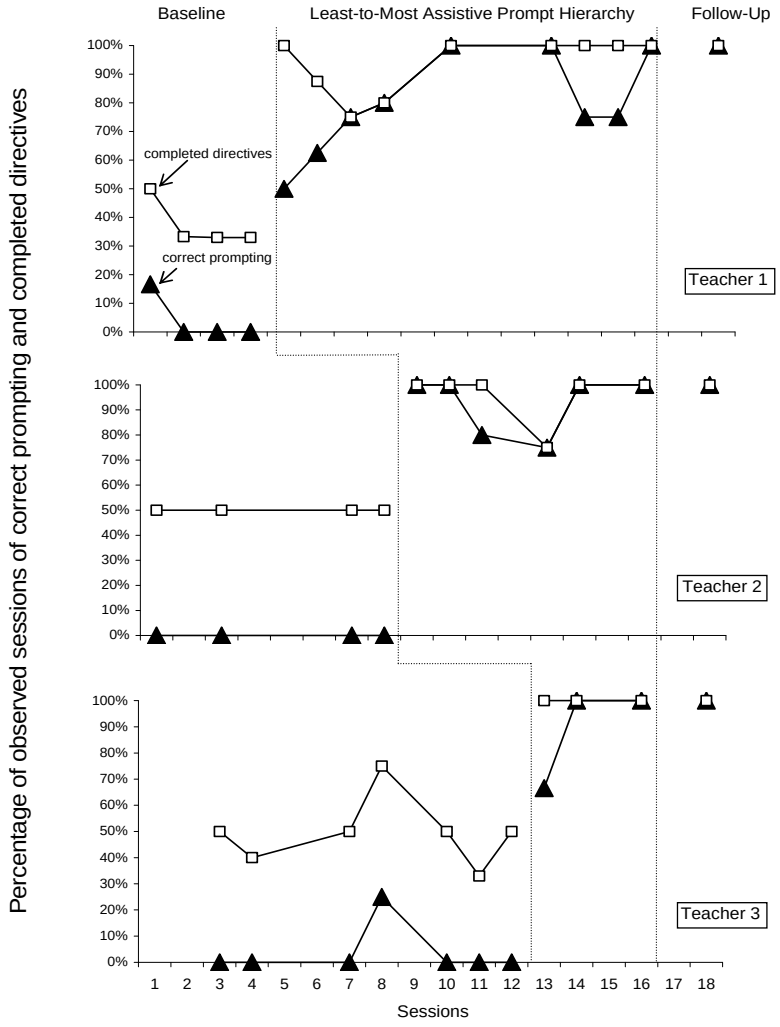

Figure 1. Percent of sessions observed with correct teacher prompting and children's completed directives across baseline and intervention.

Table 2
Average Percentage of Correct Teacher Prompts and Children's Completed Directives Across Baseline and Intervention

	Phase 1: Baseline	Phase 2: LtM	Increase
Teacher One			
Correct prompts	4%	80%	76%
Completed directives	37%	94%	57%
Teacher Two			
Correct prompts	0%	93%	93%
Completed directives	50%	96%	46%
Teacher Three			
Correct prompts	4%	89%	85%
Completed directives	50%	100%	50%

During baseline, 54% of all events represent a teacher's interaction with a child that had an identified disability; during intervention, 33% of all events represent a teacher's interaction with a child that had an identified disability. The number of events per teacher remained approximately the same across baseline and intervention sessions (Teacher One-5/4; Teacher Two-2/3; Teacher Three-4/3). During each 10-minute session, teachers interacted with approximately 2 children.

CHAPTER 5. DISCUSSION

This LtM intervention increased correct prompting for all 3 teachers relative to baseline. This is consistent with previous research (Horner & Keilitz, 1975; Wolery & Gast, 1984) that recommends using a system of least-to-most assistive prompts to teach specific behaviors to varying ages of individuals (infants to adults). Child completion of teacher directives increased across all teachers when a LtM intervention was used during the ongoing routine of an inclusive preschool classroom.

For Teacher One, the low percentage of correct prompts during baseline observations was due to the teacher only being on children's eye level for approximately 17% of the observations and only praising the children for approximately 6% of the observations. After changing the teacher's behavior through the implementation of the LtM intervention, Teacher One's correct prompts increased as a result of being on the children's eye level for approximately 89% of the observations and praising the children for approximately 73% of the observations. This increase was correspondent to an increase in child completion of directives; that is, the more correct prompting used by the teacher corresponded to more completed directives by the children.

During baseline, Teacher Two was not observed praising the children or using systematic prompting for 34% of the observations. For example, children were observed either ignoring teacher directives or escaping the situation (i.e. running away), and Teacher Two was not observed taking any further action. After introducing the LtM intervention, Teacher Two's correct prompting increased. This was due to Teacher Two's increased amount of praising the children (approximately 87% of the observations) and use of the LtM sequence (approximately 81% of the observations).

For Teacher Three, the low percentage of correct prompts during baseline observations was due to the lack of praise statements (only praising children for approximately 9% of the observations). After introducing the LtM intervention, Teacher Three's correct prompting increased. This was due to Teacher Three's increased amount of praising the children (approximately 90% of the observations).

Completion of child directives corresponded to increases in teacher prompts for all three teachers relative to baseline. This is consistent with previous research that recommends the use of teacher-child proximity, teacher-child eye level (Bredekamp & Copple, 1997), and praise (Parsons & Reid, 1999; Wilder & Atwell, 2006). Sixty-nine percent of all completed directives occurred when the teacher used the LtM intervention correctly. There was only one instance of a completed directive when the teacher used the correct LtM without also using the teacher-child proximity and teacher-child eye level prerequisites. This demonstrates that the additional two steps added to the LtM are valid in early childhood practice.

A follow-up probe on correct teacher prompts and children's completed directives revealed that gains made persisted approximately 2 weeks after the initial intervention ceased. This would seem to indicate that teachers incorporated the LtM procedure into their teaching repertoire.

Clinical Implications

The stability of the number of prompted events recorded for each teacher across baseline and the LtM intervention is noteworthy because the teachers were able to increase the amount of child completion of directives without having to increase the number of prompted events. Ultimately, teachers do not have to increase the amount of prompting, but teachers should become more efficient through the use of the LtM intervention.

Future Research

Additional research is warranted to examine the correct teacher prompts and completed child directives before and during the implementation of the LtM intervention during transition times which were not addressed in this study. Observation sessions for this study focused on free choice play center time. Measuring the correct teacher prompts and completed child directives during transition times and implementing the LtM may provide useful information to educators and researchers about the effectiveness of the LtM during different times of the day.

This study did not examine the frequency and appropriateness of teacher prompting. Teachers were not provided with guidelines on when to prompt children. Additionally, this study did not examine teachers' knowledge related to the need for child compliance. These above-mentioned questions warrant future investigation.

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INSTITUTIONAL REVIEW BOARD

ACTION ON PROTOCOL APPROVAL REQUEST

TO: Cynthia DiCarlo
Human Ecology

FROM: Robert C. Mathews
Chair, Institutional Review Board for Research with Human Subjects

DATE: April 26, 2007

RE: **IRB# 2713**

TITLE: Social Behaviors of Preschool Children

New Protocol/Modification/Continuation : N

Review type: Full ____ Expedited X **Review date:** 04/25/2007

Risk Factor: Minimal X Uncertain ____ Greater Than Minimal ____

Approved X **Disapproved** ____

Approval Date: 04/26/2007 **Approval Expiration Date:** 04/25/2008

Re-review frequency: (annual unless otherwise stated) ____

Number of subjects approved: 20

Protocol Matches Scope of Work in Grant proposal : (if applicable) N.A.

By: Robert C. Mathews, Chairman Robert C Mathews

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING -- Continuing approval is CONDITIONAL on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. SPECIAL NOTE:

**All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at http://www.fas.lsu.edu/osp/irb*

APPENDIX B: CONSENT FORM

Consent Form

1. **Study Title:**
   Social Behaviors in Preschool Children

2. **Performance Sites:**
   Louisiana State University Human Ecology Laboratory Preschool

3. **Contacts:**
   Jamie Ourso, Graduate Student
   (225)717-0480 M-F 8:30 a.m. - 4:30 p.m.
   Dr. Cynthia Dicarlo, Assistant Professor
   (225)578-7005 M-F 8:30 a.m. - 3:00 p.m.

4. **Purpose of the Study:**
   The purpose of the study is to examine the social behaviors of preschool children.

5. **Subjects:**
   A. **Inclusion Criteria**
   Preschool students, ages 3 to 5, who are enrolled at the LSU Human Ecology Child Development Laboratory Preschool.

   B. **Exclusion Criteria**
   Children not enrolled in the LSU Human Ecology Child Development Laboratory Preschool.

   C. **Maximum number of subjects:** 20

6. **Study Procedures:**

   The researcher will observe the social behavior of children in the preschool classroom. Teachers will use guidance strategies to increase children's positive social behavior. Data will then be collected to determine the effects of the teacher guidance strategies.

7. **Benefits:**
   After intervention, students may show an increase in social behavior.

8. **Risks/Discomforts:**
   There are no known risks for participation in this study.

9. **Measures taken to reduce risk**
   There are no known risks for participation in this study.

10. **Right to Refuse:**
    Participation in the study is voluntary and that subjects may change their mind and withdraw from the study at any time without penalty or loss of any benefit to which they may otherwise be entitled.

11. Privacy:

This study is confidential. Results of the study may be publicly presented for educational purposes and no identifying information will be included in the presentation. Information will only be shared with a child's parent(s), the child's teacher(s), and the director of the preschool. Specific information concerning a child other than their own, will not be shared with parents.

12. Financial Information:

Any compensation for participating and any uncompensated costs incurred by subjects are specified. No incentives will be delivered.

13. Withdrawal:

Subjects may withdraw at any time.

14. Removal:

Individuals will be removed from the study if they withdraw from the LSU Human Ecology Laboratory Preschool.

15. Signatures:

'The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Robert C. Mathews, Chairman, LSU Institutional Review Board, (225)578-8692. I agree to participate in the study described above and acknowledge the researchers' obligation to provide me with a copy of this consent form if signed by me.'

My child, _____, has permission to participate in the "Social Behaviors of Preschool Children" study.

Parent Signature_____
Date_____

---

16. Child Assent:

A researcher will read the following statement:

"Someone will watch you during interest areas, group time, or outdoor play to see how you play with your friends and your teachers. Is it okay if we watch how you play with your friends and your teachers?"

Subject Signature_____
Date_____

Study approved by
Louisiana State University
Institutional Review Board
203 B-1 David Boyd Hall
225-578-8692
Robert C. Mathews, Chair
Approval Expires 4/25/08

Students may write their name, mark an X, or give verbal assent.

Student gives verbal assent_____

Student does not give verbal assent_____

Study approved by
Louisiana State University
Institutional Review Board
203 B-1 David Boyd Hall
225-578-8692
Robert C. Mathews, Chair
Approval Expires 4/25/08

APPENDIX C: DATA SHEET

Teacher Behaviors
AR= arm's reach EL= eye level
V= verbal M= model
PH= physical PR= praise
NDG= no directive given

Child Behaviors
C= completed
NC= not completed

Date:

Session:

MINUTES

1	AR EL V / M PH PR / C NC — Event:	AR EL V / M PH PR / C NC — Event:	NDG
2	AR EL V / M PH PR / C NC — Event:	AR EL V / M PH PR / C NC — Event:	NDG
3	AR EL V / M PH PR / C NC — Event:	AR EL V / M PH PR / C NC — Event:	NDG
4	AR EL V / M PH PR / C NC — Event:	AR EL V / M PH PR / C NC — Event:	NDG
5	AR EL V / M PH PR / C NC — Event:	AR EL V / M PH PR / C NC — Event:	NDG
6	AR EL V / M PH PR / C NC — Event:	AR EL V / M PH PR / C NC — Event:	NDG
7	AR EL V / M PH PR / C NC — Event:	AR EL V / M PH PR / C NC — Event:	NDG
8	AR EL V / M PH PR / C NC — Event:	AR EL V / M PH PR / C NC — Event:	NDG
9	AR EL V / M PH PR / C NC — Event:	AR EL V / M PH PR / C NC — Event:	NDG
10	AR EL V / M PH PR / C NC — Event:	AR EL V / M PH PR / C NC — Event:	NDG

VITA

Jamie L. Ourso is a native of Donaldsonville, Louisiana. She graduated from Ascension Catholic High School in 2001. She received her Bachelor of Science in human ecology with a concentration in family, child, and consumer sciences: nursery school/kindergarten teaching from Louisiana State University in 2006. She received her Master of Science in human ecology with a concentration in family, child, and consumer sciences: early childhood education in 2007.

As a graduate student, Jamie worked in the Louisiana State University Child Development Laboratory Preschool where she taught three and four year old children. She also conducted trainings for child care providers and continues to do so today.