# ENCOURAGING INDEPENDENT PLAY:

# VERBAL VERSUS NONVERBAL

# REINFORCEMENT

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# CHAPTER I

## INTRODUCTION

A hallmark of typical development in children aged 2-3 years is their emerging autonomy. As children's abilities to complete tasks independently increase, parents encounter many opportunities to act as agents of socialization. Parents approach their roles as teachers and guides in various ways to provide support, nurturance, and limits. While some parent-child dyads may negotiate the challenges of this developmental stage with relative ease, others may encounter regular conflicts and benefit from specialized strategies to overcome difficult behaviors (Campbell, 2002).

Many factors influence children's success during this stage of emerging autonomy, including individual differences in developmental capacities, such as intelligence, and the quality of parenting and the parent-child relationship. One important factor is child temperament, which includes such characteristics as attentional control and self-regulation of activity and affect (Campbell, 2002). Complementary theories of temperament suggest that early markers of temperament can be observed in terms of infant reactivity. Later in development, toddlers' awareness of environmental demands, attention capacities, and self-regulated behavioral responses are primary constructs associated with temperament (Rothbart, Ahadi, & Evans, 2000; Kopp, 1982). It appears that several early temperament constructs, such as anger/frustration and activity level, are relatively stable from infancy to childhood (Rothbart, Ahadi, & Evans, 2000), and there

is evidence of an inverse relation between self-regulation and negative affect (Derryberry & Rothbart, 1988). Studies also suggest children's level of effortful control or attentional persistence, increases with age and is associated with concurrent increases in emotional regulation (Kochanska, Murray, & Harlan, 2000). Numerous studies have demonstrated links between children's temperament characteristics and later behavioral problems (e.g., Caspi, Henry, McGee, Moffitt, & Silva, 1995; Eisenberg et al., 2000). In addition, certain aspects of temperament are thought to be related to children's motivation to master their environments (Rothbart & Ahadi, 1994). This link has been demonstrated in a study which found early problems with academics for children with difficult temperament (Howse, Calkins, Anastopoulos, Keane, & Shelton, 2003).

Of course, the environment plays an important role as well. For example, level of parental control emerges as an important variable influencing cognitive and behavioral outcome of children who are developing independence (e.g. Hess & McDevitt, 1984; Dumas, & Lafreniere, 1998). While many temperament characteristics are theorized to contribute to the ways in which children respond to such parenting behaviors, there is evidence that parenting behaviors moderate the relation between early childhood characteristics and later behavioral outcomes, such as externalizing behavior problems and the development of conscience (Bates, Pettit, Dodge, & Ridge, 1998; Kochanska, 1997).

The impact of particular parenting strategies upon children's behavior is a focus of the current study. Parental efforts to use positive strategies appear to influence toddlers' and preschoolers' cooperation with requests and limits (Campbell, 2002). Positive parenting strategies involve many different types of responses; however, the use

of positive reinforcement is most relevant to the current study. The literature on positive reinforcement emphasizes the use of praise and tangible rewards and includes a broad range of studies. However, most of the empirical work related to positive reinforcement has been conducted with clinical populations including children with behavioral and developmental disorders (e.g., Wahler, Winkle, Peterson, & Morrison, 1965; Roberts, Hatzenbuehler, & Bean, 1981; Piazza, Bowman, Contrucci, Delia, Adelinis, & Goh, 1999). Studies suggest praise can effectively strengthen children's behavior in game-like tasks (McCullers & Stevenson, 1960; Bernhardt & Forehand, 1975); however, it is not sufficient, or necessary, for producing compliance in clinically noncompliant children or for maintaining changes in deviant behavior (Roberts, 1985; Forehand, 1986). Nevertheless, praise remains a strategy that is viewed as useful by parents and professionals working with childhood behavior problems (Forehand, 1986). There is limited evidence to suggest nonverbal reinforcement (i.e., affection) can be more effective than praise in producing appropriate behavior while minimizing inappropriate behaviors in the context of targeted intervention (Piazza et al., 1999). Very few data are available on the normative use of positive reinforcement strategies (e.g., Thompson, Rayna, Cornah, Stevenson, & Sonuga-Barke, 2002), and no studies have examined their effectiveness in promoting children's autonomy in daily activities.

In fact, there is a lack of empirical data examining specific parenting strategies for fostering skill development in typically developing children. However, Christophersen and Mortweet (2003) have written a parenting book which outlines methods for parents to help children develop certain socialized skills, and they include a chapter devoted entirely to encouraging independent play skills in young children who are increasing in

their developmental capacities for self-regulation. Theories regarding the role of play in children's cognitive development, as well as practical observations of children in educational settings, suggest that it is beneficial for children to have a broad repertoire of play behaviors, including the ability to play independently (Piaget, 1962; Garner, 1998; Readdick, 1993; Strom, 1976). A great deal of research has been devoted to examining solitary play behaviors of preschool children while in the school setting (e.g., Rubin, Maioni, & Hornung, 1976; Rubin, 1982; Coplan, Gavinski-Molina, Lagace-Seguin, & Wichmann, 2001; Coplan, Wichmann, & Lagace-Seguin, 2001); however, the focus of these studies has been on the social meaning of isolated play behaviors. There have been few studies on normal patterns of independent play (e.g., Cockrell, 1935; Farnham-Diggory & Ramsey, 1971; Ruff & Lawson, 1990; Choi & Anderson, 1991).

The current study focuses on independent play as a specific example of developing autonomy in children aged 30 to 42 months. The main purpose of the study is to compare the effectiveness of two different types of positive reinforcement strategies, praise and nonverbal affection, used to encourage children's independent play behaviors. The nonverbal approach is expected to be characterized by greater amounts of appropriate play, fewer attempts to gain the parents' attention and lower levels of negative affect. The role of individual differences is explored using measures of children's adjustment and temperament, problem behaviors, and the parent-child relationship. This study represents an empirical investigation of clinically-based recommendations, and it begins filling a gap in the literature by examining specific parenting strategies for teaching young children skills which capitalize on their emerging autonomy.

# CHAPTER II

# REVIEW OF LITERATURE

## *Overview*

Developmental milestones for children aged 2-3 years are characterized primarily by the rapid increase in autonomy demonstrated across various domains of functioning. Erikson's theory states (Hergenhahn, 1994) that the successful resolution of this stage of early childhood development results in the emergence of the virtue of will, which he defined as "'the unbroken determination to exercise free choice as well as self-restraint'…" (p.175). The link between autonomy and self-regulation is forged by the process of internalization, which involves a shift from external to internal motivations and sustenance of behavior (Ryan, Deci, & Grolnick, 1995). The completion of toilet training is a hallmark milestone that illustrates how the internalization of societal values and practices can result in self-regulated, autonomous behavior. However, independent toileting is only one example of the sorts of behaviors young children develop as their sense of autonomy increases. Children this age also begin to take more responsibility for dressing and cleanliness, as they are better able to manipulate objects like clothing and verbally express their tastes and preferences. In addition, young children at this stage begin spending more time outside of the home participating in experiences that promote socialization (Brazelton, 1974). Playtime with peers can provide relief for tired caregivers

(Readdick, 1993), as well as opportunities for children to explore while learning the limits that structure adaptive social relations (Brazelton, 1974).

Although independent feeding, toileting, and dressing represent achievements that are expected and welcomed, parents' influence upon children at this age remains critical. Not all parents will interpret their children's efforts to assert independence in the same manner. Parents demonstrate varying levels of tolerance, as some can rationalize destructive, aggressive, and inappropriate behaviors as being consistent with gender expectations, while others see age-appropriate attempts to be independent as problematic, such as when a 2- or 3-year-old has a mild temper outburst or expresses defiance (Campbell, 1983). It can be a challenge for a parent to embrace the achievement of independence as a major task of toddlerhood while also guiding the exuberant will of the child according to social convention and morals. Thus, parent-child relations at this developmental stage have often been characterized as a chronic "battle of wills," (e.g., Hergenhahn, 1994; Brazelton, 1974).

In spite of the common concerns among parents of 2 ½ - to 3 ½ year-olds regarding discipline and limit-setting (Campbell, 1983), not all parent-child interactions during the preschool period are tumultuous and conflicted. In fact, many children do not seem to be generally resistant to parental authority during this stage. In addition, many parents have been found to demonstrate several responses that seem to foster children's independence with minimal conflict (Nucci, Killen, & Smetana, 1996). Specifically, the data suggest that children most often demonstrate resistance in order to express their desires and needs for personal choice. In addition, investigators have found that mothers support young children's autonomy primarily in the personal domain, which involves

decisions regarding what and how much to eat, what and whom to play with, and how to dress and keep one's body. The ways in which mothers support children's autonomy include offering choices, giving the child sole responsibility for a choice, and negotiating. Overall, the emergence of children's autonomy has been characterized by the coexistence of children's will and choice with obedience and conformity to common norms, as well as moral and prudential constraints (Nucci et al., 1996).

Nucci et al. (1996) reviewed additional research findings that have shown how teachers in the preschool classroom setting also supported children's autonomy by providing choices regarding personal issues; however, the opportunities for children to assert their choices or preferences were more constrained in the classroom than they were at home. The authors presumed that the teachers' responsibility to manage the group was prioritized over the nurturance of individuals' autonomy. A caveat to the findings presented thus far on how adults foster children's autonomy is that they may not represent the typical interactions of adults and children from all cultures. For example, Escovar (1982) reported that Hispanic and Latin American families tend to emphasize dependence more than self-reliance in their child-rearing practices.

Nevertheless, the studies reviewed by Nucci et al. (1996) illustrate the unique opportunities parents have to foster autonomy in their children while at home. Although the school setting does not typically provide the same quality or quantity of opportunities for fostering autonomy in young children, children's ability to be independent and autonomous is definitely important in the classroom setting. For example, in a study conducted by Deutsch (1960), teachers from a relatively impoverished school reported that many students lacked the attention spans and interest levels necessary to remain on

task with the curriculum being presented. Lacking the inner motivation to achieve, students behaved inappropriately and teachers typically spent 75 to 80 percent of their time disciplining students. Furthermore, whether in the school, home, or community, it is not uncommon to encounter children who seem to be unable to entertain themselves or dislike being alone and will, therefore, attempt to avoid such discomfort relentlessly (Christophersen & Mortweet, 2003). Strom (1976) described the problems associated with an ability to be alone and direct one's own activities as follows: "When people have no recourse to imagination, reflection, analytic thinking, and self-examination, then their mental health and the well-being of others they can influence are all in jeopardy" (p. 152). It is, therefore, important for parents to help their children at home to develop a balanced set of skills for relating to others effectively and pursuing solitary activities productively.

The literature review that follows will address three areas of research related to the current study. First, theory and research on temperament is presented. This literature is important to examine, because temperament exerts so much influence on a child's early experiences and accounts for some of the individual differences during the developmental period examined. Next, the literature on the effectiveness of positive reinforcement is presented. Although none of the studies in this area has examined the use of positive reinforcement in the same manner as the current study, the findings presented provide an empirical background for the specific parenting strategies being tested. Finally, the literature relevant to independent play as a specific developmental milestone is presented. The last section of the literature review includes studies that examine the play behaviors of young children, as well as elaboration on the value of independent play skills.

*Temperament: Attention, Affect, and Self-Regulation*

Temperament is defined as the individual differences in reactivity and self-regulation, which are assumed to have a biological basis. Reactivity refers to the excitability, responsiveness, and arousability of an individual's systems (Rothbart, Ahadi, & Evans, 2000), and the construct of self-regulation encompasses processes that can be observed on multiple levels, including the physiological, attentional, emotional, cognitive, and interpersonal domains of functioning (Calkins & Fox, 2002). Examples of such self-regulation processes include approach, avoidance, and attention (Rothbart & Ahadi, 1994). Current temperament theory asserts that an infant does not possess a full spectrum of reactive and regulatory systems at birth, but rather develops these systems as various emotions appear at different developmental stages (Rothbart et al., 2000). Thus, temperamental characteristics are not viewed as static and unchanging but as adaptive to environmental demands and influenced over time by heredity, maturation, and experience (Rothhbart & Ahadi, 1994). Yet, there is certainly evidence for the stability of temperament over time (Caspi, et al., 1995).

Developmental models of temperament and self-regulation have been offered that highlight the dynamic nature of these constructs. Kopp (1982) offers a developmental model of self-regulation and phases of control that begin at birth, while Rothbart and Ahadi (1994) describe the developmental course of temperament, which includes the development of self-regulatory capacities. Together, they provide much detail regarding the ways in which infants cope with and react to their internal and external environments.

Rothbart and Ahadi (1994) very simply describe temperament in the first few months of life as observed in an infant's levels of general distress. According to Kopp

(1982), from birth to age 2-3 months, the first antecedents of self-regulation are seen in the neurophysiologic modulation of arousal and activation, as well as organized patterns of behavior, such that at least some general distress signals are viewed as efforts to modulate and organize early experiences. Indicative behaviors include reflex movements, self-soothing, regulation of sensory input (i.e., looking at or away from stimuli), and development of clearly defined cycles of wakefulness. Between 3 months and 9 months, sensorimotor modulation enables the infant to change ongoing behavior in response to events and stimuli in the environment. For example, infants in this stage reach for and grasp objects to experience stimulation and comfort (Kopp, 1982). Rothbart and Ahadi (1994) indicate the development of frustration, fear, and approach behaviors during this phase. In addition, they note the development of caution and inhibition in novel situations between the ages of 8 and 10 months.

The earliest signs of control can be observed when an infant is between 12 and 18 months old. During this stage of developing self-regulation, an infant exhibits increased awareness of social and task demands and will initiate, maintain, and cease behaviors in response to those demands. In addition, infants in this age range begin using communication, demonstrate compliance, and exhibit rudimentary self-monitoring skills (Kopp, 1982). Beginning at this stage, the antecedents of self-regulation are considered primary markers of temperament, as the child's ability to inhibit responses and sustain effortful attention begins to modulate approach responses and expressiveness according to situational demands or explicit instructions from adults (Rothbart & Ahadi, 1994).

Kopp's (1982) model continues beyond the first two years and suggests that at 24 months of age and older, self-control emerges. Toddlers demonstrate more sophisticated

versions of the previously mentioned skills, as they begin to be able to delay upon request and behave according to social expectations without external monitors. Advances in representational thinking and recall memory differentiate toddlers' self-regulation abilities in this stage from previous stages; however, children this age do not yet exhibit the flexibility to adapt their skills in new situations. This flexibility emerges in children who are 36 months and older. At this age, children begin to exhibit control that is considered to be true self-regulation. Given that much of the development of self-regulation is related to increased control over attentional processes (Calkins & Fox, 2002), some additional information on attention as a component of temperament will be reviewed, especially with respect to the developmental period of the children targeted for the current study. First, however, the following studies provide information on several important components of temperament and how they relate to children's behavioral adjustment.

Caspi, et al. (1995) used a child sample from the general population to examine relations between early temperament and later adjustment. Using a longitudinal design with a large cohort, they measured temperament at ages 3, 5, 7, and 9 years based on behavioral observations during laboratory administered psychological evaluations. Their factor analyses yielded three- and four-factor solutions at various ages with some differences based on sex.

The factors included the following designations: Lack of Control, Irritability, and Distractibility; Approach; Sluggishness; and Wariness. The Lack of Control factor was found only at ages 3 and 5 years; it reflected reduced inhibition, lack of persistence, and negative reactivity. At ages 7 and 9 years, the Lack of Control factor split into two

factors, which included Irritability and Distractibility. The Irritability factor reflected reduced inhibition and emotional control, as well as restlessness, impulsive behavior, and rough behavior. The Distractibility factor reflected withdrawal from tasks, a high need for encouragement, short attention span, and lack of persistence.

Another factor that changed over time was the Wariness factor. This factor was found only for boys at age 3 and included shyness, fear and apprehension, stranger anxiety, task refusals, and a high need for encouragement. The Approach factor, which reflected behaviors indicating a willingness and eagerness to explore in new situations, and the Sluggishness factor, which included ratings of flat affect, passive responses, and little verbal communication, emerged in each age period.

The researchers also collected parent and teacher reports on children's behavioral adjustment at ages 9, 11, 13, and 15 years. Correlation analyses indicated significant associations between the Lack of Control factor scores at ages 3 and 5 and later externalizing behaviors, such as hyperactivity, attention problems, antisocial behavior, and conduct disorder. Individual differences in Approach ratings were negatively correlated with ratings of boys' Anxiety/Fearfulness at age 9. However, this temperament factor was not significantly associated with any measure of later adjustment for girls. Finally, unique patterns of associations were found for the Sluggishness factor based on child sex. For boys, there were no consistent relations of this factor to later behavior, but Sluggishness in early childhood for girls was significantly related to anxiety, attention problems, and socialized delinquency in early adolescence.

Using the same cohort, Caspi and Silva (1995) demonstrated temperament in early childhood is also linked with personality differences in young adulthood. Using a

self-report personality questionnaire, they found stability in two constellations of behavioral items. They first designated groups of individuals based on their factor scores in early childhood. The group designated by high scores on the irritability and distractibility components of the Lack of Control factor were found to report high levels of impulsivity and negative emotions at age 18. In addition, a stable pattern of behavior and characteristics was found for the group of individuals who received high scores on the Sluggishness factor and the components of the Lack of Control factor indicating distractibility and difficulties with attention. As young adults, these individuals reported higher levels of caution and restraint, as well as social submissiveness.

Hart, Hoffman, Wolfgang, and Keller (1997) followed the work of Caspi and Silva (1995) by examining the implications of three childhood personality types on self-reported personality in adolescence. In an Icelandic sample of 7-year-olds they identified children as resilient (e.g., independent and focused), overcontrolled (e.g., shy and anxious), and undercontrolled (impulsive and physically active) using a standard set of personality descriptors which guided coding of three different interviews/assessments conducted with the children. Behavior ratings and grade point averages were gathered from teachers at three or four time periods (depending on whether children were from urban or rural areas) between the ages of 8 and 15 years. Three longitudinally consistent scales were derived from the behavior ratings, including Attention Problems, Negative Behavior, and Social Withdrawal. Using inverse factor analysis and mean comparisons, the results indicated that children in the resilient personality group had higher levels of academic achievement and fewer attention problems than children in the other two groups. In addition, children in the overcontrolled group were rated more highly on the

measure of social withdrawal, while children in the undercontrolled group demonstrated higher levels of aggression in adolescence than the other two groups.

These studies provide a broad and general view of temperament constructs and demonstrate how temperament in early childhood has been found to be related to later measures of behavioral adjustment and personality. Although the findings presented thus far are not based on contemporary measures of temperament, they provide a foundation for the body of evidence which points to the links between early patterns of childhood behaviors and later functioning. The following studies extend these earlier findings using more contemporary approaches to measuring temperament.

Eisenberg et al. (2000) collected data in a short-term longitudinal study designed to examine the relations between negative emotionality, attentional regulation, and externalizing behavior problems. Elementary school children participated in two assessments, which included a puzzle box task measuring behavioral regulation (i.e., control of emotion-related behaviors), as well as parents' and teachers' reports of attention regulation, which is conceptualized as a component of emotional control. Parents and teachers also rated children's levels of negative emotionality and externalizing behavior problems. Regression analyses indicated an inverse relation between measures of regulation and externalizing problem behaviors. Path analyses further indicated that negative emotionality moderated the relation between attentional control and externalizing problems across time, but it did not affect the relation between behavioral regulation and problem behavior. Specifically, results indicated low levels of attentional control were more important in the prediction of behavior problems for children who were high in negative emotionality. This finding was significant, because as

the authors point out, attentional control is a temperament construct which is thought to influence the internal regulation of emotions, whereas behavioral regulation is suggested to include observable emotion-related behaviors.

The ability to regulate emotions is not just linked with the emergence of behavior problems. It also appears to be related to success in the school setting. Recent short-term longitudinal data indicate that children who have difficulty regulating their emotions are at increased risk for academic problems (Howse et al. 2003). The results of this study indicated that children who have difficulty with frustration or maintaining positive mood may be more likely to have difficulty focusing attention, planning and finishing tasks, and regulating other achievement-related behaviors, such as distractibility, autonomy/independence, and interest in challenging tasks.

The ability to focus attention and resist distractions while working independently is influenced by a child's level of attentional persistence, also referred to as effortful control (Rothbart & Ahadi, 1994). This dimension of temperament is particularly relevant to the current study, because its role in the development of self-regulation is prominent in the early childhood years. Factor analysis using the Child Behavior Questionnaire suggests the global dimension of effortful control is comprised of low intensity pleasure, inhibitory control, attentional focusing, and perceptual sensitivity (Rothbart, Ahadi, & Hersey, 2001).

The development of effortful control first appears in the later months of the first year of life; it accompanies the maturation of attention processes, (Rothbart & Ahadi, 1994) and its development appears to involve a dramatic transition around age 30 months (Posner & Rothbart, 2000). Functions of effortful control have included delaying,

slowing down motor activity, suppressing or initiating activity to a signal, effortful attention, and lowering voice (Kochanska, Murray, & Harlan, 2000). From a neurophysiological perspective, effortful control is considered a component of executive attention and is suggested to involve a process wherein priority is assigned by voluntary means to certain areas of neural activity (Posner & Rothbart, 2000).

In a longitudinal study that used behavioral tasks and parent ratings to measure effortful control at 22 and 33 months of age, effortful control significantly improved over time and became more coherent as a construct (Kochanska, Murray, & Harlan, 2000). Girls exhibited higher levels of effortful control, and greater effortful control was predicted by children's focused attention at 9 months of age, mother's responsiveness at 22 months, and mothers' self-reported socialization level. Greater effortful control at 22 months was associated concurrently with more regulated anger, and at 33 months, it was associated with more regulated anger and joy, as well as stronger restraint in a forbidden objects task.

Age-related increases in control have also been demonstrated with measures of delay/response inhibition (Vaughn, Kopp, & Krakow, 1984). Increased cognitive development was positively related to increased ability to delay, suggesting that younger children with advanced cognitive development may exhibit greater self-control abilities than their less developed age-mates. From a temperament perspective, however, certain qualities, such as being high in effortful and inhibitory control, may actually predispose children to develop orientations toward achievement and mastery motivation (Rothbart & Ahadi 1994). Mastery motivation represents the intrinsic motivational force to achieve

and improve skills and to master the environment, which is often accomplished through self-directed exploratory and play behaviors (Glenn & Cunningham, 2002).

Kochanska, Murray, and Coy (1997) examined the link between inhibitory control and measures of conscience, which included observed levels of committed compliance. Kochanska and Aksan (1995) explain committed compliance as involving two types of compliance, which are particular relevant to the period in which children are developing autonomy. Specifically, they identified two types of compliance: 1) committed compliance, which is viewed as self-regulated and occurs when the child appears to fully adopt and accept the parental agenda; and 2) situational compliance, when the child is cooperative but lacks an internalized commitment to the parental agenda and, therefore, requires sustained parental monitoring and control. The study by Kochanska, Murray, and Coy (1997) conducted concurrent and longitudinal examinations of the relations between inhibitory control and various measures of conscience. Results indicated significant relations between inhibitory control measured at three time periods in development (toddler, preschool, and early school) and children's moral conscience at early school age.

More recently, Kochanska, Coy, and Murray (2001) conducted a longitudinal examination of rates of committed and situational compliance with “do” and “don’t” commands when children were 14, 22, 33, and 45 months of age. Overall, they found that rates of committed compliance increased significantly from 14 to 33 months and then leveled off. They also measured children’s levels of effortful control and found significant correlations between higher levels of effortful control and committed compliance in both “do” and “don’t” contexts, although the relation was stronger for the “don’t” commands.

Investigation into which temperamental characteristics might influence children's behavior during experimental tasks is beyond the scope of the current study; however, it would seem that higher levels of attention/self-regulation capacities would optimize children's ability to meet the expectations for playing independently. Furthermore, it seems there would be certain child characteristics, such as distractibility, impulsivity, and increased negative emotion/reactivity, which would make independent play difficult for both the child and the parent. High activity levels, reduced tolerance for frustration, low attentional control, and low levels of effortful control are all potential sources if behavior problems in the context of fostering children's independence.

Helping a child develop independence would certainly seem to increase the likelihood of his/her later success in school and beyond. The clinical recommendations investigated in the current study (Christophersen and Mortweet, 2003) provide a starting point for parents to strengthen the behaviors that seem to reflect such temperament and personality characteristics as effortful control and mastery motivation. However, because none of the studies on temperament characteristics involves independent play, it is not clear how these factors might influence the emergence of this skill.

Consideration of the relations between various temperament characteristics and behavior problems must take into account the role of the environment. In a study of the relations between temperament, parenting behavior, and externalizing behavior problems, Bates et al. (1998) demonstrated a moderating role of parental control in the relation between temperament and behavior problems. Using two samples and a longitudinal design, they measured infant/toddler temperament, specifically resistance to control, through mother-report questionnaires and home observations. Resistance to control is

thought to reflect a collection of other temperamental dispositions, such as decreased fear/inhibition and decreased effortful control. During middle childhood, mothers and teachers provided reports on children's behavior problems. Analyses included structural equation modeling to test the moderating effect of parenting behavior. Results suggested that child temperament was more strongly predicted externalizing behaviors in middle childhood under conditions of low levels of maternal control.

In another study, Kochanska (1995) demonstrated interaction effects between children's temperament and attachment security/parental discipline style when examining children's internalization of rules and committed compliance. A number of laboratory tasks and mother-report questionnaires were used to measure the variables of interest. The results of the regression analyses indicated that for children who were low in fear, higher levels of secure attachment predicted increased committed compliance and internalization of rules. However, for children who were relatively fearful, maternal gentle discipline (as opposed to reliance on control strategies) predicted committed compliance and internalization of rules**.** Thus, different aspects of the parent-child relationship were shown to influence children's behaviors in an interactive manner with child temperament.

Considering the literature on temperament and the development of self-regulatory capacities, it seems that some children are biologically predisposed to present greater behavioral difficulties, such as noncompliance. When families seek treatment for such conduct problems, there are empirically supported treatments available that involve training parents to modify environmental contingencies for their children’s appropriate and inappropriate behaviors (e.g., Hembree-Kigin & McNeil, 1995), and positive

reinforcement is a central therapeutic component. It is unknown whether successful treatment of noncompliance generally results in increases in committed versus situational compliance; however, the relation found between effortful control and committed compliance in the Kochanska et al. (2001) study suggests that perhaps a child's temperament and self-regulatory abilities may be influential in the outcome. Of course, parenting style plays a role, and parenting is typically the target of intervention. Therefore, one might hypothesize implications for the implementation of treatment, especially in terms of the interaction between temperament and the degree to which positive reinforcement is an effective method of behavioral control. It will be shown in the next section that the literature on the effectiveness and utility of positive reinforcement is controversial, especially when it is intended to increase compliance in noncompliant children.

*Effectiveness of Positive Reinforcement*

Miller and Dollard (1941) explained that reinforcement is a critical factor for learning and that people do not learn unless they are rewarded. They further indicated that acquired rewards, such as praise, are particularly important in social life. Filcheck, McNeil, and Herschell (2001) noted the rationale for using praise in clinical interventions with children is based on the assumption that social acceptance is reinforcing. However, the functional reinforcement value of praise has been called into question in numerous investigations (e.g., Forehand, 1986; Piazza et al., 1999). Overall, the utility and effectiveness of praise must be considered in context, as there are few, if any, absolute conclusions which can be drawn from the body of literature in current existence.

An early parent training study conducted by Wahler et al. (1965) provided promising results for the effectiveness of praise for helping parents improve the problem behaviors of their young children. The authors presented data from 3 case studies and used a multiple baseline design for 2 of the participants. The participants were two 4-year-old boys and one 6-year-old boy whose parents had presented for treatment of various problem behaviors. The author instructed parents to use differential attention during the treatment phases to reduce commanding behavior and increase cooperative behavior in boy 1, to reduce dependent behavior and increase independent behavior in boy 2, and to reduce oppositional behavior and increase cooperative behavior in boy 3. Parents ignored problem behaviors and provided social reinforcement (i.e., positive attention) for the incompatible, more desirable behaviors. The best results were obtained for behaviors which were unrelated to compliance, and a time-out procedure was necessary to effect change in noncompliant, oppositional behavior. Since then, there have been many studies showing the use of praise alone is not an effective approach to establishing or maintaining compliance in clinically non-compliant children (e.g., Budd, Green, & Baer, 1976; Roberts, 1985; Roberts, Hatzenbuehler, & Bean 1981). Budd et al. (1976) performed a single-subject study in which they trained a mother to modify her use of attention to her young child's noncompliance with instructions. They used a multiple baseline procedure. The mother was observed to praise an average of 98% of the child's compliance at baseline, which suggested this contingency alone was not sufficient to maintain consistent levels of compliance. Each treatment phase involved training on various parent behaviors related to giving instructions and intervening following an instruction. The last phase of intervention involved the implementation of a time-out

procedure for noncompliance. The results of the study indicated differential social attention did not effectively increase appropriate behavior in the absence of punishment for inappropriate behavior.

Roberts, Hatzenbuehler, and Bean (1981) also used a multiple baseline design with 32 children, ages 2 to 7, and their mothers. The children had been referred to treatment for conduct problems, including noncompliance, tantrums, back talking, and/or fighting. During baseline sessions mothers issued 30 commands, which were prompted by the researcher using a bug-in-the-ear device, in the clinic playroom and gave no other verbal or physical responses (This procedure is known as the Compliance Test). Researchers coded child compliance/noncompliance. There were two experimental conditions. In the attention condition, mothers practiced using positive verbal skills during free play and then repeated baseline procedures with the addition of praise following compliance. In the time-out condition, baseline procedures were repeated with the addition of a time-out procedure for noncompliance. Results indicated increased compliance ratios were strongly associated with the use of the time-out contingency, but the attention manipulation did not have a significant effect on child compliance.

In a later study Roberts (1985) conducted 3 projects designed to evaluate the hypotheses underlying the use of contingent praise. The main hypotheses tested were that conduct disordered children are relatively unresponsive to adult approval at pre-treatment and that they become responsive to it by post-treatment. To test these hypotheses, the author had mothers and their young children complete the Compliance Test (i.e., a series of 60 instructions given by the mother to the child to clean up the playroom) and the Social Reinforcer Effectiveness Test (SRET). The SRET involves a neutral

discrimination task (i.e., the "marble game") for which there are only two possible responses. To test a child's responsiveness to social reinforcement, he/she is given praise contingent on whichever response is determined to be less preferred according to baseline measurement. In this study, the mother was instructed via a bug-in-the-ear device to issue specific praise statements contingent on the less preferred response during a 6-minute reinforcement phase. The investigator calculated a reinforcement ratio by dividing the number of nonpreferred responses by the total response number. The baseline ratio (same calculation but from the baseline phase) was subtracted from the reinforcement ratio to yield a social reinforcement score (SR). A correlation analysis between compliance ratios during the Compliance Test and SR scores indicated no linear relationship between child responsiveness to contingent praise and compliance to maternal instructions. A sub-sample of clinically noncompliant children were retested following treatment and results indicated they were significantly responsive to contingent maternal praise on the SRET at both pre- and post-treatment with no significant increases in responsiveness due to treatment.

Roberts (1985) also investigated whether contingent praise for compliance maintains compliant responding once compliance is acquired using a time-out procedure. He recruited 20 clinic-referred mother-child dyads at post-treatment. Participants were randomly assigned to either an attention or an ignore condition and underwent a Maintenance Test. The Maintenance Test was similar to the Compliance Test but was conducted in a novel room and preceded by a brief period of positive, interactive free play. During the Maintenance Test, children in the attention condition received praise following compliance and children in the ignore condition received no response from

their mothers following compliance. Although previous treatment had involved time-out and resulted in improved compliance, there was no intervention for noncompliance during the Maintenance Test until criteria for extinction was met (i.e., 10 successive noncompliant responses). Standardized treatment procedures were used to reinstate compliance in the event of extinction. ANOVA analyses revealed no effect of condition on compliance, which remained high for all children during the Maintenance Test. Therefore, the author concluded contingent praise had not served a reinforcement function for compliant responding. In the third project, the author used a single case reversal design to test the hypothesis that children had maintained compliance in order to avoid time-out. The first condition of the study was planned to involve cycles of the ignore condition of the Maintenance Test, brief periods of positive, interactive free play, and the Compliance Test until extinction occurred (i.e., 10 successive instances of noncompliance). The second condition was planned to follow extinction and involve only time-out contingent upon noncompliance; however, the child never met extinction criteria.

The studies conducted by Roberts (1985) provide compelling evidence that praise does not strengthen or maintain compliance in children who initially exhibit clinical levels of noncompliance. In addition, there does not appear to be any relation between child compliance during a clean-up task and child responsiveness to praise on a neutral discrimination task. In other words, children who were noncompliant during a clean-up task were no less responsive to praise during the neutral task. Given these conclusions, he suggested time-out may serve a negatively reinforcing effect on compliance (i.e., children comply to avoid time-out); however, the procedure designed to test this hypothesis could

not be completed due to the child's failure to meet extinction criteria. The child in the final study was the author's son and was, therefore, dissimilar to the clinic-referred children in the previous studies. Although the children in all of the studies appeared to maintain compliant responding for reasons other than immediate praise, the author suggested praise may affect other important variables, such as mother's self-perception or child's self-esteem. However, he did not explicitly mention the possibility that persistent compliance could result from the history of using both time-out and praise in the treatment of noncompliance. It is unknown whether the same results would have been obtained if the previous treatment had involved only giving time-out for noncompliance and no contingent praise.

In a controversial review, Forehand (1986) examined the data on the effectiveness of parental positive reinforcement of deviant children. He included non-intervention studies, intervention studies, and consumer satisfaction studies in his review. He concluded that the data from non-intervention and intervention studies suggested parental positive reinforcement is neither a necessary nor sufficient procedure to produce or maintain changes in deviant behavior. However, consumer satisfaction studies showed parents view positive reinforcement as acceptable and useful.

In their response to Forehand's review, Lutzker, Touchette, and Campbell (1988) suggested that positive reinforcement had not been adequately identified and measured. They also expressed concerns about the over-emphasis on punishment that emerged from the findings that showed positive reinforcement alone did not effectively change deviant behavior. They urged, as others have (e.g., Christophersen & Mortweet, 2003), that time-out procedures are maximally effective only when "time-in" (i.e., positive reinforcement)

is enriched. In spite of the lack of evidence for its effectiveness, it seems that researchers agree praise should continue being incorporated into clinical interventions, given the difficulties studying its direct effects, as well as the fact that parents seem to like it (Forehand, 1986; Lutzker et al., 1988; Roberts et al., 1981)

Studies conducted in classroom settings yield similar findings as those conducted with clinic-referred children. Pfiffner, Rosen, and O'Leary (1985) manipulated a special education teacher's behavior management approach with eight 2nd and 3rd graders who had behavior problems. The teacher typically used a combination of regular positive (i.e., praise, bonus work, and posting work) and negative (i.e., time-out, verbal reprimands, and response cost) approaches for managing students' behaviors in class. Using a multiple baseline design, experimental phases included withdrawal of negative consequences and enhancing positive consequences. In the condition for which negative consequences were removed, the teacher used only regular positives for appropriate behavior. In the enhanced positives condition, negative consequences continued to be withheld while the teacher increased the frequency of regular positives and added individual incentive programs for the students. Although reinforcements were given for on-task behavior and complete, accurate work throughout the entire school days, the researchers only used measures of on-task behavior during a 1-hour period of each day to measure the effects. The results indicated that praise and other regular positive reinforcement alone were not effective in maintaining on-task behavior in a special education classroom with students who had behavior problems. The students exhibited greater levels of on-task behavior under the enhanced positives condition, which involved individual incentive systems, than they did under the regular positives condition, but the

combined approach, which involved positive and negative consequences, was most effective in maintaining on-task behavior. A later study (Pfiffner & O'Leary, 1987) revealed the importance of having a history of negative consequences in order for incentive systems to be maximally effective. The methodology was similar to the earlier study, but it was conducted with a group of students enrolled in a summer class. Conditions were regular positive reinforcement (as in the 1985 study), enhanced positives alone (i.e., frequent praise and individual incentive systems), enhanced positives and negatives (i.e., added firm, brief, specific reprimands for off-task behavior), and enhanced positives and fading negatives (i.e., reprimands were gradually reduced over the last several days). On-task rates dropped in the regular positives alone condition but did not increase in the enhanced positives condition as they had in the previous study. The conditions in which negative consequences were used had the highest rates of on-task behavior. In contrast to these findings, Hall, Lund, and Jackson (1968) found positive results for the effects of teacher reinforcement on students' study behaviors. They conducted two single case studies in poverty-area classrooms with one 1st grader and five 3rd graders and their teachers. Using a reversal design, they analyzed the reliability with which teachers could modify the study behavior of children, rated as disruptive or dawdling, using systematic manipulation of contingent attention. The reinforcement condition involved teachers giving verbal and nonverbal social reinforcement for appropriate study behaviors. For all students, the reinforcement condition led to significant increases in study behavior, which were above baseline and reversal levels and were often associated with decreases in disruptive/off-task behaviors, as well as improved work quality and grades. Trolinder (2001) also found slight increases

in on-task behavior with an intervention that used praise accompanied by suggestions for future behavior. Two students identified as having low attention participated; however, a lack of return to baseline makes the conclusions much weaker.

Piazza and colleagues (1999) provide a unique examination of the functional value of praise, nonverbal positive reinforcement, and verbal reprimands with two 11-year-old boys diagnosed with developmental disabilities and behavioral disturbances. Functional analyses indicated that, for both boys, destructive behavior was maintained by attention (i.e., verbal reprimands). Functional communication training (FCT) was planned to help them develop alternate responses, thereby reducing destructive behaviors. Prior to embarking on FCT, researchers conducted a reinforcer assessment with Boy 1 to determine whether praise would function as an effective reinforcement when verbal reprimands were provided concurrently. Because Boy 1 allocated his responses exclusively toward toys that were associated with verbal reprimands, the assessment indicated verbal reprimands were a more effective reinforcement than praise. Therefore, FCT was conducted with extinction, such that destructive behaviors were no longer reprimanded. In spite of the lack of evidence that praise would function as reinforcement it was included in the treatment due to parental preference. Surprisingly, analysis of treatment indicated that praise alone did serve a reinforcing function during FCT with extinction, as destructive behaviors dropped and communication increased compared with multiple baseline conditions. However, it was not clear whether extinction alone would have produced the same results.

The limitations of the first study with Boy 1 included the failure to suggest non-extinction-based treatments and failure to address the problem of competition between

different forms of attention when ignoring cannot be used safely. Therefore, a different approach was used with Boy 2. During the reinforcer assessment phase, the authors evaluated the reinforcing properties of verbal attention in the form of verbal reprimands and nonverbal attention in the form of tickles. The results suggested physical attention was the more effective reinforcer for Boy 2. FCT was conducted without extinction, such that destructive behavior continued to result in verbal reprimand; however, there were two conditions of reinforcement for appropriate communication, including verbal reinforcement (i.e., praise) and nonverbal reinforcement (i.e., tickles). An ABAB design compared the two conditions. The results indicated that FCT using physical attention as reinforcement was more effective than FCT using praise as reinforcement, as destructive behaviors were significantly greater in the praise conditions and appropriate communication was greater in the physical attention condition.

The data on praise for increasing play and other behaviors are generally more supportive of its effectiveness. Labeled praise (i.e., praise which comments on specific desirable behaviors) has been shown to be effective in strengthening children's behavior during simple game-like tasks (Bernhardt & Forehand, 1975; Filcheck et al., 2001). However, when McCullers and Stevenson (1960) examined the relative influence of physical reinforcement (i.e., distribution of marbles) with and without additional verbal reinforcement (i.e., praise) with children aged 3 to 4 and 8 to 9, they found that verbal reinforcement had a significant influence only on the behavior of the younger children. In addition, praise appears to be effective in reinforcing preschool children's novel use of blocks, as Goetz (1981) found increased numbers of new block formations during the reinforcement phase of her controlled experiment. Furthermore, programs with children

and adults with developmental disabilities have shown that praise, along with provision of choices, prompts, and modeling, has served to increase appropriate toy play (Dicarlo, Reid, & Stricklin, 2003; Wehman, 1976).

In an exploratory study of the controlling variables upon persisting behavior, Wolf (1938) examined three incentive conditions with a sample of 20 5-year-olds using 5 different tasks. The tasks, which included construction with tinker toys, a large muscle motor task involving a ring toss, a fine motor task using a pegboard and tweezers, a paper-and-pencil cancellation task, and a repetitive ball dropping task, were performed by the children under conditions of no incentive, praise, and competition. Group averages indicated that incentives improved persistence with competition being the most effective incentive, followed by praise and working alone. However, the author concluded that the effect of incentives depended on the specific task involved, as the tinker toy construction task was distinguished from the other tasks.

In her examination of the individual quartile ranks under the two incentive conditions, the author also concluded the effect of praise was highly variable among the group of kindergarteners. Furthermore, her descriptions of individual case studies suggested personality and family background factors may have influenced persistence under various conditions. She noted differences in children's response patterns, such as consistency of responses, and she described characteristics that were consistent with contemporary variables of temperament. For example, some children were described as shy, quiet, and reticent, whereas others were more socially oriented and happy. Other children were described as having disrupted family backgrounds, sensitivity to criticism, and low frustration tolerance. Some were described as restless underachievers who were

irritable and resistant to praise, while others were viewed as adaptive in their responses, demonstrating mastery motivation and resilience to failure. Of course, the lack of sophisticated statistical analyses limited the study's conclusions; however, the author observed that behavioral persistence appeared highly dependent upon the type of task, the specific conditions of the incentive offered, and the broad personality characteristics of the children.

Whereas Wolf (1938) found that competition in a group was generally the most effective incentive for increasing persistence in her sample of typically developing young children, Wahler and Fox (1980) found competition was counterproductive to the development of appropriate behavior in a sample of oppositional/aggressive children. The results of the Wahler and Fox (1980) study suggested that solitary play was a more effective component than social (i.e., competitive) play or television watching to include in their treatment approach.

Using a single-subject design with four children ages 5 through 8 referred for treatment of conduct problems, the authors observed during the baseline period that solitary play, though initially low in frequency, was consistently negatively correlated with parent reports of aggression. Therefore, they designed the intervention to compare a social play contract and a solitary play contract with a time-out contingency added later. In-home observations and parent reports of problem behaviors were used as outcome measures. For 3 of the children, the social play contract was implemented first, such that the child played a game with rules with the mother and other family members during a time each day that had been identified as having an increased likelihood of misbehavior. For these 3 children, the second phase of treatment substituted the social play contract

with a solitary play contract, which involved the same schedule but required the child to play with any toy alone while in the presence of other family members. The child was not allowed to approach others or respond to others; however, parents were instructed to provide social approval to the child during play. For 1 child, treatment began with a T.V. watching contract and was followed by the solitary play contract. Compliance with the contracts resulted in points earned and exchanged for a reward at the end of 5 days.

The results indicated the same pattern for all 4 boys. Baseline measures indicated high rates of social interaction, low rates of oppositional behavior which increased over time, and low rates of toy play. In the social play and T.V. watching contract conditions, there were no decreases in oppositional behavior, teasing, demandingness, or fighting, and behaviors actually worsened in the social play condition. In contrast, in the solitary play contract condition, there were increases in toy play and decreases in oppositional behavior during the observational periods; however, gains were short-lived, and a combined approach with time-out was necessary to reinstate the previous positive changes. The authors concluded the data suggested a functional incompatibility between children's solitary toy play and oppositional actions. These results have been used to support the assertions that independent play skills are important and valuable to a child's development and that, at least for some children, having these skills might decrease the likelihood of getting into trouble (Christophersen and Mortweet, 2003).

Although the boys in the Wahler and Fox (1980) study were provided social approval during their solitary play activities, it is unknown what role this type of reinforcement provided, as this aspect of the treatment protocol was not manipulated or measured. In addition, because the presentation of treatments was not counterbalanced,

order effects are unknown and must be considered when interpreting the results. It is possible that such stark contrasts in the expectations and limits for the other two interventions as compared with the requirements of solitary play intervention may have been responsible for the changes in behavior. This certainly seems possible given that a time-out contingency was needed to regain initial positive treatment effects. Furthermore, the lack of treatment reversal weakens the causal attributions in favor of solitary play. However, the validity of Wahler and Fox's conclusions regarding solitary play are strengthened when one considers the implications of the order effects reported in the Wolf (1938) study. Of all the tasks presented to the children in Wolf's study, an order effect was found only for the unsolvable tinker toy task. The indication was that experience of failure on this task seemed to cancel the effect of praise or competition in subsequent presentations of the task. If this had been the case in the Wahler and Fox study, one would have expected the boys' failures during the social play and television contract phases to have negatively impacted their sensitivity to reinforcement in the solitary play contract phase. Of course, just as an order effect cannot be ruled out in the Wahler and Fox study, there were instructive exceptions to the order effect found in the Wolf study. As summarized earlier, Wolf (1938) described some of the children in her study as being resilient to failure, such that they were eager and persistent in their attempts to solve the tinker toy task at each presentation. When considering the results of these two very different studies together, it seems they both reflect how children tend to differ in their responses to various environmental contingencies. These variations are likely based, in part, on differences in temperament, personality, and behavioral patterns.

The Wahler and Fox (1980) and Wolf (1938) studies also demonstrate how these variations may impact children's independent and play activities.

*Play Behavior: Solitary and Independent Play*

The early childhood developmental period is an ideal time to foster independent play skills, as parents can capitalize on children's emerging independence and autonomy and prepare them for later success in school and adulthood. Christophersen and Mortweet (2003) devoted an entire chapter in their book on parenting to present a method for encouraging independent play. They define independent play skills as the child's ability to entertain himself or herself for extended periods of time without any help from an adult. In addition, the authors assert that independent play skills help to develop the child's ability to concentrate, persist with tasks, enjoy time alone, and play well with others. They also suggest that children with independent play skills will be less likely to get into trouble and require less adult supervision, which provides more time for parents to fulfill their responsibilities. Readdick (1993) discussed independent play skills when advocating for young children's privacy needs. The author cited self-regulation of privacy needs as a central early childhood task and gave several reasons for supporting children's private play. Specifically, she indicated children's time alone provides opportunities to construct a sense of self as separate from others, to test and foster autonomy, and to consolidate skills as they work toward mastery or creation of unique products. Readdick (1993) recommended adults give verbal feedback and guidance while structuring the environment appropriately to support children's solitary pursuits; however, she focused on children who have already developed the ability to play alone.

Christophersen and Mortweet (2003) provide guidelines for parents of children who have not yet achieved this ability. They offer three recommendations for parents: 1) make sure your child has time for independent play (i.e., scheduling); 2) model good independent play skills (i.e., demonstrate parental competence with tasks like reading, paying bills, etc…); and 3) provide positive feedback (i.e., reinforce your child's independent play skills).

Christophersen and Mortweet (2003) urge parents to use nonverbal techniques to foster independent play, because they assert that nonverbal reinforcement works better to encourage independent play skills than verbal reinforcement (i.e., praise). They explain as follows:

> Nonverbal feedback strategies such as a pat on the head or squeeze of the shoulder as you walk by work best; many parents discover that when they verbally praise a child (for example, "Hey, you are doing a good job playing in there.") she will stop playing and want the parent to interact with her. It may seem like the more you try to praise your child for playing independently, particularly a younger child, the more he wants you to play with him! That is why we recommend quiet feedback instead. It is far less distracting to your child but will still communicate that you are pleased with his playing alone. (pp 198-199)

Although the rationale presented by Christophersen and Mortweet (2003) seems reasonable, it is based on clinical experience rather than empirical data. The accuracy of the authors' assertion is important, as it has been found that the use of praise for good behavior is quite common across parents, regardless of their general approach to discipline (Thompson et al., 2002). In addition, in an observational study of non-clinical

families, girls received praise from parents more than boys (Fagot, 1974), which suggests differences in parent-child relations should be considered when determining appropriate strategies. However, as the literature presented on positive reinforcement demonstrated, few studies have been conducted with non-clinical or "normal" child samples to determine the most effective way to reinforce desired behavior.

The literature on children's play behaviors is also limited in the extent to which it applies to the current investigation. Specifically, most studies on children's solitary play pursuits are framed within the social context of a classroom or nursery school rather than the home environment. These investigations have typically involved peer comparisons based on well-developed hierarchical theories of play behavior and do not consider parents' or teachers' expectations for the development of self-regulation and autonomy. Therefore, many of the studies presented in the following section are based on a different conceptualization of independent play than what is used in the current investigation. For a broader perspective on the role of play in early childhood development, Piaget's (1962) theory of play and a contemporary overview of play development will be reviewed. A review of the literature on children's solitary play pursuits in the classroom setting will then be presented, followed by studies describing the nature of young children's play under various conditions.

Piaget (1962) presented a developmental model of play that reflected his theory on cognitive development. The essence of his theory suggests that play is an integral part of the development of intelligence, primarily as it represents the predominance of assimilation over accommodation. He concluded there are 3 types of games: 1) practice games, 2) symbolic games, and 3) games with rules. These types of games correspond

with successive forms of intelligence (i.e., sensory motor, representational, and reflective). He explained that playful exercises occur throughout childhood as new skills are acquired, such that adaptive behaviors develop during play through a process that involves practice, as well as the rewarding emotional experiences involving pleasure at being the cause of action and feelings of power that accompany such control. Thus, play, in general, supports the consolidation of intelligence.

In a more contemporary review of play development, Garner (1998) categorized infant and toddler play into four categories, including object play, motor play, social play, and symbolic/pretend play. The developmental progression of play with objects begins in infancy with repetitive motor behaviors, which use the body as the object of play. Between seven and twelve months, infants' abilities to physically manipulate objects in the environment increase and exploratory play with objects begins to show clear patterns between nine and sixteen months of age. For example, 10- to 12-month-olds have been observed to use play objects differently based on the objects' texture and sound-making potentials (Dai, B. 1999). Manipulative object play remains the focus throughout the second and third years of life; however, by age 3, children's play becomes more functional or goal-oriented rather than exploratory (Garner, 1998). Motor play for two- and three-year-olds is characterized by climbing, pushing, pulling, and riding, and as fine motor control increases, children are typically beginning to cut, paste, and create with art materials. Regarding social play, parents engage infants with motor and object play to assist their exploration. However, children develop more interest in peers during the second year. Symbolic/pretend play has been linked to cognitive development, and it is

initially a solitary activity that emerged at about 1 year of age. In the preschool years, children may begin linking together pretend actions to create social themes.

In an early observational study of 42 nursery school children aged 1 to 4 years, Parten (1932) set the stage for numerous investigations into children's play activities in the school setting. The methodology used in this classic study has served as a model for many of the later studies, and the categories used to describe children's play have also endured. The author observed children during the same hour each day when they were engaged in free play activities. Each child was observed for 1 minute at a time on numerous occasions. Children's intelligence quotients (IQ) ranged from 81 to 145, and the children came from a variety of socioeconomic backgrounds. The method for measuring intelligence was not reported.

Play behaviors were coded in terms of the level of social participation. The following categories were introduced [1]: 1) unoccupied behavior, 2) onlooker behavior, 3) solitary independent play (i.e., playing in proximity to others but using different toy(s) and making to no reference to others' activities), 4) parallel activity (i.e., independent play of children next to each other using separate but equal toys/materials), 5) associative play (i.e., children sharing materials), and 6) cooperative play (i.e., a group organized activity).

The results of the author's observations indicated that unoccupied behavior was uncommon among the children in the sample. Solitary play was common, but there was a great deal of variation in the amount of time children spent engaged in this type of activity. Onlooker behavior was observed for all but 2 children, but was not generally a

[1] Similar categories were described by Piaget (1962) in Play, dreams, and imitation in childhood and were attributed to Charlotte Būhler.

frequent activity. Parallel play was common and frequent for almost all of the children studied. Associative play was fairly common, and cooperative play was highly variable among the sample; both of these types of play were more common in older children. Correlation analyses revealed a negative association between solitary play and measured intelligence, as well as a positive association between parallel play and intelligence quotients. The author suggested these findings reflected a pattern of the more intelligent younger children choosing parallel play, because they were, at the very least, more interested in what were considered the most rudimentary social activities. The implication of these conclusions was that solitary play represented a less mature, and therefore a less desirable, form of play.

Unfortunately, Parten (1932) did not discuss the potential influence that limited materials or space may have had on her findings. This information is particularly important given the slight distinction between solitary independent and parallel play. That is, these play categories differed only in whether children used the same materials or toys as the children nearest to them. It seems possible that some children may have engaged in solitary play due to an insufficient amount of materials, which would have resulted in fewer options. In addition, the author of the study was interested in children's social participation and may have presented an unwarranted bias and/or an overgeneralization in the interpretation of her results. It is important to note that both solitary and parallel play, as defined in the Parten study, would be considered independent play as it is defined in the present study.

Moore, Evertson, and Brophy (1974) challenged the presumption that solitary play was indicative of non-sociability. In their observational study of 6 private

kindergarten classes during free play periods, teachers observed and recorded the frequency and quality of the children's solitary play activities. The participants were 116 Caucasian children who were classified as middle class. The authors determined that almost half of all the solitary play activities recorded were goal-directed or educational and that less than 6% were indicative of maladjusted or inhibited/withdrawn behavior. The implication of their findings was that solitary play was most often characterized by independent, task-oriented behavior that was functional in school settings and indicative of maturity rather than immaturity.

Rubin, Maioni, and Hornung (1976) also contended with the implications of Parten's (1932) study in their observational study investigating the relationship between the social play hierarchy posited by Parten (1932) and the cognitive theory of Piaget. They specifically examined the differences between the free play behaviors of middle and lower class preschoolers using an observational coding system. In addition to the categories from Parten (1932), they included the following types of play: 1) functional play (i.e., simple, repetitive sensory-motor movements), 2) constructive play, 3) dramatic play, and 4) games with rules. There were 40 preschoolers in the study, all of whom were of Caucasian descent. The method employed was similar to that of Parten (1932).

The results of their analyses of variance indicated that middle class children displayed more constructive, associative, and cooperative play and that lower socioeconomic status (SES) children displayed more parallel and functional play. They also found that girls displayed more constructive and less dramatic play than boys, while boys displayed more solitary-functional and associative-dramatic play than girls. Lower SES children displayed more solitary-functional and parallel-functional and less

associative-constructive and cooperative-dramatic play than middle class children. For all children, parallel play was most frequent, followed by associative and solitary. Cooperative play was significantly less frequent than the other forms of play. There were no differences found for onlooker, unoccupied or solitary play behaviors. Similar to the conclusions of Moore et al. (1974), the authors proposed that solitary play was not the least mature form of play, given the predominance of constructive activities in that category.

Rubin (1982) aimed to identify the forms of nonsocial play in 4-year-olds that correlated, either positively or negatively, with assessments of competence in the social, social-cognitive, and cognitive domains. He hypothesized that solitary-functional play, solitary-dramatic play, and unoccupied and onlooker behaviors would be negatively correlated with markers of competence. In addition, he hypothesized that constructive play would correlate positively with measures of competence. Multiple in-class observations were conducted over time, and other measures included a sociometric popularity rating, teacher ratings of social competence on the Preschool Behavior Questionnaire, performance on measures of role-taking, social problem solving, and impersonal problem solving, and the Peabody Picture Vocabulary Test (a measure of receptive vocabulary).

Results indicated that solitary-functional, solitary-dramatic, and parallel-functional play behaviors were correlated negatively with all indices of preschool competence. However, other forms of nonsocial activity, including solitary-constructive play and onlooker behavior appeared to be relatively benign with respect to their relations

to competence. Parallel constructive play was highly predictive of competence, and it was the most frequently observed activity in the preschool setting under study.

Coplan, Wichmann, and Lagace-Seguin (2001) reported similar findings as Rubin (1982). They combined solitary-dramatic and solitary-functional play into one category and called it solitary-active. They explored the relations between this category of play with behavioral adjustment, temperament, and cognitive functioning. Their sample included 153 children aged 45 to 57 months. Their measures included the Colorado Child Temperament Inventory (parent report), a 2-item parent-report rating of child's attitude to school, and the Preschool Behavior Questionnaire (teacher report of problem behavior). Also, children's performances on the Peabody Picture Vocabulary Test-Revised, "Sand: Concepts about Print" (an index of early literacy), and a numeric skills assessment were used. The early literacy and the numeric skills assessment were combined to yield an aggregate measure of early academic skills. Researchers also conducted behavioral observations and divided the sample into groups according to extreme frequencies of solitary-active play.

The results from their multivariate analysis of variance indicated children in the solitary-active group were significantly less attentive, shyer, and more difficult to soothe than children in the comparison group. Children in the solitary-active group also demonstrated more externalizing behavior problems, lower scores on early academic skills, and a significantly less positive attitude toward school than their counterparts.

In a similar study Coplan, Gavisnki-Molina, Lagace-Seguin, & Wichmann (2001) examined the relations between nonsocial play behaviors and adjustment in kindergarten. There were 77 children in the study who were observed during free play periods in class.

Additional measures were similar to those of the previously reported study by the same principle investigator; however, academic achievement was measured differently and more thoroughly. Also, in this study, the behavioral category of reticent behavior included both onlooker and unoccupied behaviors previously reported elsewhere (e.g., Rubin, 1982). The results of their regression analyses indicated that parent-rated child shyness was associated with reticent behavior observed in class. For boys, shyness was also significantly related to solitary-passive play (i.e., quiet exploration and constructive behavior), which, in turn, was related to maladjustment in the form of internalizing problems. For girls, solitary-active play was related to maladjustment in the form of externalizing problems. For both sexes, reticent behavior was associated with indices of maladjustment.

Similarly, Lloyd and Howe (2003) reported reticent behavior to be negatively associated with convergent and divergent thinking skills. However, Spinrad et al. (2004) presented a different view of reticent behavior. They reported that reticent play was not associated with low social competence and that children who engaged in this behavior were well-liked by peers and rated low on problem behavior by teachers and parents. They were also seen as being high in effortful regulation and low in anger and observed emotion. The findings related to solitary play were somewhat more consistent with previous findings, though. Specifically, they reported that solitary play, which did not include distinctions between solitary-active (i.e., functional) and solitary-passive (i.e., constructive), was initially found to be related to low self-regulation, higher rates of peer exclusion/rejection, and increased anxiety/fearfulness. However, the relation between anxiety and solitary play was not found to be consistent over time. Although Spinrad et

al. (2004) collected behavioral observations during free play nearly every day for two semesters, their observations included outdoor play in addition to the typically observed indoor play. Furthermore, they employed a "scan method" (p. 72) to make behavioral observations, which may not have provided the same quality of observations as in other studies. Thus, their conclusions may be less reliable due to methodological differences.

In summary, the collected investigations of Rubin and colleagues, Coplan and colleagues, and others indicate that certain forms of solitary play, namely functional and dramatic play, are likely indicators of poor adjustment. Generally, solitary-passive (i.e., solitary-constructive) play is considered adaptive, with the exception that it has been found to be related to shyness and internalizing behaviors in boys. This gender effect should be replicated before accepting that solitary-constructive play consistently represents maladjustment in boys, especially given the fact that group data have not necessarily supported this finding. Lloyd and Howe (2003) failed to find a correlation between gender and solitary-passive play. However, some support for the relation between anxiety and solitary-passive play is found in Henderson, Marshall, Fox, and Rubin (2004), in which play behaviors and other characteristics, such as temperament and EEG patterns, in 4-year-olds were observed. Observations were conducted in a laboratory with small groups of children. Children who were classified as reticent and that exhibiting solitary-passive play received higher ratings of mother-reported shyness, as well as a pattern of right frontal EEG asymmetry; however, only the reticent children were found to have fearful temperaments. The authors concluded that solitary-passive play may provide a way for children to cope with unease in social situations with peers.

The solitary play studies provide a perspective on independent and nonsocial play as they occur in the preschool and kindergarten settings. In addition, they generate a basic understanding of the diversity of children's play and how certain forms of solitary play may or may not be adaptive. Furthermore, the findings regarding links between solitary play and adjustment and competence represent empirical data that is certainly relevant to the early intervention and prevention of later behavioral or emotional problems.

The solitary play studies were designed within a framework that places priority on social play; thus, the context of these studies is quite different from that of the present investigation. Whereas the emphasis in the solitary play studies is on the educational arena and peer relations, the present study is most relevant to the home environment and parent-child relations, where a child's ability to play independently may be more consistently functional and adaptive. However, there has been a call for supporting children's needs for privacy and allowing solitary pursuits in the classroom, based upon the argument that such play leads to academic/intellectual benefits (Readdick, 1993). In fact, there are many activities that are suited to independent play which have been shown to foster mathematical understanding, such as block play, water play, sorting play, and constructive play (Jarrell, 1998).

Given that children ages 3 to 11 spend about 2 to 3 hours playing each day across both the home and school settings (Timmer, Eccles, & O'Brien, 1985), there are likely daily opportunities for parents to foster their children's ability to engage in such activities at home. However, there are many considerations regarding how it would be best to foster such skills. For example, parents should have reasonable expectations about the temporal qualities of such play, as well as what steps should be taken to encourage

children to play independently. The following studies will address the former issue, while the latter issue is addressed in the present study. Again, several of the studies that follow were conducted in the school setting; however, there is more emphasis on independent play as it is defined in the current investigation and its normative qualities.

In an early observational study of play with 6 nursery school children aged 2 years, 2 months to 3 years, 6 months, Cockrell (1935) coded thousands of play behaviors while watching children play alone and in dyads. She conducted her observations with 6 different play settings, 4 of which made only one type of toy available, 1 of which was a combination of all play materials, and 1 which was just a bare room with only a table and chairs. During the observations, children played in an observable room that was separate from the nursery. The children were permitted to leave the observation room anytime they wished, and play materials were evaluated to determine how long they could hold the children's attention. Data were tabulated into time graphs and activity charts.

Based on group data, Cockrell (1935) concluded that the combined materials had the highest ranked "holding power," followed by clay and crayons, pictures and books, blocks, housekeeping materials, and companions only (i.e., bare room). Although the author found no consistent differences between children, she suggested that consistencies within each child's behaviors indicated personality differences were influential in the play behaviors observed. Of particular relevance to the current study was the example of one child having good independent play skills compared with one who did not. In general, however, the children were able to play alone and did so for more than a half an hour in some cases. The average time that elapsed before children needed or wanted adult guidance during solitary play was approximately 14 minutes.

Ruff and Lawson (1990) conducted two studies of young children's sustained, focused attention during free play and used procedures which required children to engage in independent play defined in the same manner as Christophersen and Mortweet (2003). They defined focused attention as times during which the child was judged to be concentrating on an object or on some activity with the object, with the following exclusions: a) instances in which the child was talking to the mother or examiner, even while looking at toys; b) instances in which the child's eyes were moving around the entire collection of toys or when the child was picking up toys in succession; c) instances in which the child was laughing or smiling; d) engagement in stereotyped, repetitive activity; and e) times when the child was just looking at the toys without engaging in any activity.

In their first study, Ruff and Lawson (1990) observed children's focused attention during independent play longitudinally at ages 1, 2, and 3 ½ years. The mother and the experimenter were engaged in their own work while they child played. The overall results indicated that children sustained attention longer as they got older. The second study was a cross-sectional investigation with 2 ½-, 3 ½-, and 4 ½-year-olds, which replicated the main findings of the longitudinal study but showed that the increase in focused attention from 2 ½ to 3 ½ years was the only significant increase from one age to another. However, the authors noted the results for general attention were much different than those obtained for focused attention. In other words, if the definition of attention excluded fewer conditions, there would not have been a significant linear trend of increased attention with age in the longitudinal study. Further analysis indicated that while there was a 98% increase in focused attention from 2 ½ to 3 ½ years, there was

only a 7% increase in duration of total orientation to toys. The authors speculated that higher frequencies and longer episodes of attention found with increased age were related to children's growing ability to perform more elaborate activities and to their developing self-regulation skills.

Choi and Anderson (1991) investigated free toy play in 5-year-olds and hypothesized that the temporal patterns of attention and distractibility during such play would be similar to those found during television viewing. In their first study, children were observed individually during two 90-minute play sessions. Parents were in the same room, and children were asked to play alone while the parent was busy reading. Parents were instructed to avoid distracting their children from the play with toys.

The researchers found that children were engaged with toys throughout most of the sessions, playing approximately 78% to 93% of the total play sessions. When the children were not engaged with toys, they were interacting with parents, eating, engaging in play not focused on toys, or napping. They were also noted to engage in "diffuse activity" (p.49). Episodes of toy play were defined as continuous play activity, which included examining or handling a toy. Play episodes began when visual orientation or handling was focused on a toy and ended when these behaviors shifted to a different toy or a non-play activity. Median play episodes ranged from 10 to 34 seconds and mean lengths ranged from 34 to 106 seconds. Play episodes were widely variable and were not normally distributed. Rather, they were highly skewed and best fit by a lognormal distribution, which was reported to be similar to findings for looks at television. Although most play episodes were under 30 seconds, the longest play episodes ranged from 5.7 minutes to 18.9 minutes. No autocorrelation was found for play episodes, meaning that

current episode length did not predict future episode length for any subject. The conditional probability that a play episode would terminate (i.e., its hazard value) peaked between 3 and 14 seconds and then declined. The average time to peak was 7 seconds; however, hazard values were one of the two most individually variable measures. After one minute of continuous play the episode was 1/3 as likely to terminate in any given second as it was during its peak vulnerability.

In a second study, the authors used a slide show distractor to test the hypothesis that the hazard function reflects attentional engagement. The main analysis targeted changes in distractibility as a function of play episode length at the time of the distractor. They used a 2 (sex) by 9 (interval) multivariate analysis of variance using the interval variable, which was logarithmically structured and bounded by 1, 2, 4, 8, 16, 32, 64, and 128 seconds (plus the interval consisting of all play episodes greater than 128 seconds), as a repeated measure. The dependent variable was the proportion of head turns to the distractor. They found a main effect of interval and determined from inspection that the mean probability of distraction as a function of play episode length prior to the distractor peaked at between 8 and 16 seconds. The authors reported that analyses were complicated by the fact that only about 25% of all distractor presentations resulted in head turns. However, they concluded that distractibility from play episodes follows a time course that was reasonably parallel to that of the hazard function, such that distractibility increased to a peak at about 12 seconds and declined thereafter. They suggested their findings reflect a generalized tendency known as attentional inertia, which is also seen in television watching. In other words, they argued that children's

tendencies to sustain their orientation to a stimulus, such as a toy or television, are strengthened as a function of the time that orientation has already been sustained.

These findings may have implications for the current study in that they suggest there may be intervals during the independent play task in which children are more distractible. It is important to note, however, the authors' narrow definition of a play episode results in a measure of distractibility that includes shifts from one toy to another. In the present study, this type of shift would only be viewed as a distraction if the child engaged in other behavior that is not defined as appropriate play (e.g., talking to the parent or leaving the area). Nevertheless, it seems that children may be less distracted by parental reinforcement once they have become fully engaged with a particular play task. Sensitivity to this possibility in the present study must be limited, though, so that experimental control can be maintained. Thus, this may be a pertinent issue when interpreting the current results and discussing future investigations.

Farnham-Diggory and Ramsey (1971) conducted a study that provides information on the effects of frequent interruptions during children's play, which is also highly relevant to the current study. They based their study on the hypothesis that poor play skills in young children are attributable to such prior home experiences as lack of social reinforcement for sustained play, interruptions from other children or adults, or damaged play materials. To test their hypothesis, the authors created analogous conditions in the laboratory during a 10-minute free play period and then measured subsequent play persistence on a block task. They used a sample of 56 African American 5-year-old female children and randomly assigned the participants to 4 conditions.

In the neutral condition, children were permitted to play freely with toys in good condition. The toys included a puzzle, bubbles, play dough, a magic slate, paints, a whistle, and a book. In the defective toy condition, the free play was the same as the neutral condition except none of the toys worked properly. In the interruption condition, the toys were the same as the neutral condition; however, the experimenter interrupted the children's play as soon as they appeared fully interested in a toy. Interruptions involved statements such as, "I bet you haven't tried *this* toy yet," (p.297) and the experimenter would push a different toy in front of the child. In the reinforcement condition, children were given social reinforcement on schedules that matched the rates of interruptions in the interruption condition, which was about every 27 seconds. Following the 10-minute treatment, children were invited to play with a set of blocks for as long as they wished.

The results indicated that the average time of persistence on the block task was 11.5 minutes across all 4 conditions. Compared to the neutral condition, there were no differences in play persistence from those in the defective toys or social reinforcement conditions. In addition, there was no difference between the persistence of children in the reinforcement and defective toys conditions. However, children in the interruption condition demonstrated significantly less persistence than the children in the social reinforcement and defective conditions. Thus, the authors concluded that constant interruptions upon the play activities of young children may interfere with subsequent play persistence.

The Farnham-Diggory and Ramsey (1971) study illustrates the concerns of Christophersen and Mortweet (2003) relatively well in that it supports the notion that

parents should avoid distracting their children during independent play. However, it is interesting to note that the social reinforcement condition, which involved frequent reinforcement on the same schedule as the interruption condition, did not result in decreased persistence on the subsequent play task. Unfortunately, the authors did not elaborate on the specifics of the type of social reinforcement used; therefore, it is unknown whether they used a verbal or nonverbal method. This issue will be addressed directly in the present study, such that differences in levels of distraction, or the absence of play persistence, will be tested under each condition of social reinforcement.

*Summary*

In summary, the present study aim is to determine children's levels of sustained engagement in an independent play task when their parents use a nonverbal reinforcement technique versus a verbal reinforcement technique to encourage the child's independent play. Because the early childhood period of development is ideal for fostering independence, the sample will be comprised of parents and their 2 ½ to 3 ½ – year-old children. The research question for the current investigation emerged from the work of Christophersen and Mortweet (2003) who suggest that children are more likely to become distracted from their independent play activity when parents use praise. Instead of praise, they strongly advocate for the use of brief, nonverbal signs of affection to reinforce a child's emerging independent play skills. In the present study, the hypothesis that children demonstrate higher levels of engagement in independent play when they are given nonverbal reinforcement than when they are given verbal reinforcement will be tested directly.

The development of independent and autonomous behaviors, such as independent play, is potentially influenced by socio-cultural expectations (Escovar, 1982), parents' skills for encouraging independence (e.g., Nucci et al., 1996), and child temperament. Currently, there are no studies that link temperament variables directly to independent play skills. However, there is evidence that early difficulties with emotion regulation and high levels of negative emotion are associated with disruptions in later achievement-related behaviors, such as autonomy/independence, as well as externalizing behavior problems (Eisenberg et al., 2000; Howse et al., 2003). In the current study, parents will complete behavioral questionnaires that will identify levels of negative emotion and externalizing behaviors in their children. Therefore, relations between these factors and the child's behavior during the independent play task will be examined in the analyses. If significant relations are found between parent-rated behavioral/emotional adjustment and children's persistence in the independent play task, they would provide a unique basis for future inquiries into the interactions between child temperaments, developmental issues, and parenting.

The current study also presents an opportunity to broaden the research on positive reinforcement and clarify the contexts and manners in which it might be used most effectively. The literature on positive reinforcement provides mixed evidence regarding its effectiveness, especially when it is in the form of praise. Researchers studying interventions for clinically noncompliant children have consistently found, in both the home and classroom settings, that a time-out contingency is necessary to establish stable gains in compliance and that positive reinforcement alone is not sufficient to do so (e.g., Roberts, 1985; Pfiffner, Rosen, & O'Leary, 1985). However, positive reinforcement

continues to be used and recommended by leaders in the field for the treatment of such behavior problems. Furthermore, there is substantial evidence that praise can be used to effectively strengthen behaviors unrelated to compliance (e.g., Bernhardt & Forehand, 1975; Goetz, 1981). Perhaps most intriguing is the possibility that children vary systematically in their responses to praise (Wolf, 1938); however, even the most noncompliant children have been shown to be responsive to adult approval (Roberts, 1985). Similarly, even when data suggest the functional value of praise is less than an alternative consequence, such as a verbal reprimand for inappropriate behavior, it has been shown that it can still serve to effectively reinforce appropriate behavior (Piazza et al., 1999).

There are currently no studies that examine the use of positive reinforcement as a way to foster independent play. Thus, there is limited opportunity to demonstrate how the present study will improve upon the methodologies of previous investigations. There will be an effort to avoid potential confounds that complicated previous conclusions regarding effective methods of reinforcement and behavior change (Wolf, 1938; Wahler & Fox, 1980). Specifically, experimental conditions will be counterbalanced to avoid confounding the study with potential order effects. Also, parents' use of praise and affection during an interactive free play will provide some, albeit limited, information regarding the rates of positive reinforcement to which the children are accustomed.

# CHAPTER III

# METHODOLOGY

## *Participants*

Thirty-nine parent-child dyads participated in the study. Parent-child dyads were recruited from the community using a variety of methods, including telephone calls, newspaper advertisements, fliers, and participant referrals. Experimental procedures were discontinued prior to completion for two dyads due to children's excessive emotional upset during experimental conditions. One dyad was dropped due to a technical problem resulting in incomplete videotaping of participation. Thus, analyses are based on the remaining participants (N = 36). An equal number of participants completed procedures in each counterbalanced presentation of conditions, and the final sample included 16 boys and 20 girls. All of the children dropped from the study were girls.

The children were 30 to 42 months of age ($M$ = 35.72, $SD$ = 3.84), and mothers' mean age was 31 years ($SD$ = 4.4). The majority of mothers and children were Caucasian (91.7% of mothers; 86.1% of children). Asian ethnicity was reported for one mother and two children. In addition, two mothers and one child were indicated as being in the ethnic category of "other," and one child was reported to be Bi-racial. English was a second language for two of the dyads who participated; however, the mothers were fluent in English and their children regularly participated in classroom activities with exposure to English. Mothers' education levels ranged from 12 to 17 years, and 41% of the sample

worked as homemakers. Monthly family income was over $2500 for 66.7% of the sample, and all but one mother was currently married. The majority of mothers reported non-clinical levels of parenting stress as measured by the Parenting Stress Index—Short Form (PSI-SF) (Abidin, 1995). The mean total score percentile rank on the PSI-SF was 50.1 (*SD* = 27.49), and only 4 mothers' total scores were above the cut-off for clinical significance (i.e., ≥85$^{th}$ percentile). Children in the current sample presented as typically developing with receptive vocabulary test scores on the Peabody Picture Vocabulary Test—Third Edition (PPVT-III) in the normal range (*M* = 99.86, *SD* = 11.59); however, one child was observed to have limited expressive vocabulary, and her behavior problems prevented completion of the PPVT-III. No other difficulties were experienced with this participant; therefore, she was retained in the sample.

*Measures*

*Demographic Questionnaire*. Each parent completed a demographic questionnaire to provide basic descriptive information about the sample. The questionnaire included the following information: parent's age and education level, parent's marital status and ethnicity, parent's work status (i.e. employed full-time, part-time, or not at all), the number of people in the home, estimated family income, and child's date of birth and ethnicity.

*The Peabody Picture Vocabulary Test—Third Edition (PPVT-III).* The PPVT-III (Dunn & Dunn, 1997) is a measure of receptive vocabulary and also serves as a screening test of intellectual functioning. This test was used for descriptive purposes, and the results were offered to parents as an incentive for participation. The PPVT-III is individually administered and requires examinees to indicate, with a verbal or non-verbal response,

the picture in a stimulus book that matches the stimulus word provided by the examiner. The PPVT-III has two comparable forms (L and M), which are ideal for test-retest purposes. In the manual, it is reported that alternate forms reliability coefficients based on standard scores range from .88 to .96; similar coefficients were found using raw scores, as well. Split-half reliability coefficients were calculated using only the actual items taken by each participant. W-ability scale scores were estimated for each half of odd and even-numbered items, and these scale scores were correlated. Reliability coefficients ranged from .86 to .97. For children aged two years, six months to three years, six months the coefficients ranged from .89 to .92 on both forms. Test-retest reliability coefficients for the youngest age group were .92 for Form IIIA and .91 for Form IIIB.

Content validity for the use of the PPVT-III as a measure of receptive vocabulary is indicated by its consistency with the Webster's New Collegiate Dictionary (1953, 1967, 1981). Construct validity for the use of this test as a screening measure of intellectual functioning is supported by claims in the literature that vocabulary tests are highly indicative of general intellectual ability and correlated most highly with overall Intelligence Quotient (IQ) scores on commonly used intelligence tests. Criterion-related validity for the PPVT-III was established by correlational studies, which were completed during the standardization of the test. Correlation coefficients ranged from .65 to .91 for all measures of cognitive ability and oral language that were examined. The highest correlation was found for the Verbal IQ on the Wechsler Intelligence Scale for Children-Third Edition, while the lowest correlation was found for the Matrices score on the Kaufman Brief Intelligence Test.

*Parent-Reports of Child Adjustment, Behavior, and Parent-Child Relations.* Although the measures of children's adjustment and behavior problems described below are limited by parents' perceptions, research has shown they provide valid estimates of child behavior in both referred and non-referred populations (Achenbach & Rescorla, 2000; Eyberg & Pincus, 1999). Parent report measures have been criticized for failing to meet all psychometric standards (Humphreys & Ciminero, 1979); however, there is evidence to suggest parental report on behavior measures accurately predicts observed child behavior in the laboratory (Webster-Stratton & Eyberg, 1982). Thus, the parent-report measures are considered to be adequate for their intended purposes in the current study.

*Achenbach's System of Empirically-Based Assessment (ASEBA).* This measure was used to describe the sample in terms of children's adjustment and was used in correlation analyses to examine the relation between parent-reported child behavior and coded child behaviors. Parents completed the Child Behavior Checklist for ages 1 ½ to 5 years (CBCL/1 ½ -5), which is a component of the ASEBA (Achenbach & Rescorla, 2000). The CBCL/1 ½ - 5 is a revision of the CBCL/2-3 (Achenbach, 1992), and it is designed to obtain standardized ratings and descriptive details of children's functioning as seen by parents. It is comprised of seven syndrome scales and three problem scales. In addition, the measure includes five DSM-oriented scales, which are based on the American Psychiatric Association's (1994) Diagnostic and Statistical Manual—Fourth Edition (DSM-IV).

The syndrome scales include Emotionally Reactive, Anxious/Depressed, Somatic Complaints, Withdrawn, Sleep Problems, Attention Problems, and Aggressive Behavior.

The borderline clinical range for syndrome scales includes T-scores from 65 to 69, while T scores greater than or equal to 70 are in the clinical range. Test-retest reliability for the syndrome scales has been reported to range from *r* = .68 (Anxious/Depressed) to .92 (Sleep Problems). Inter-rater reliability, or cross-informant agreement, for the syndrome scales has also been reported and ranged from *r* = .48 (Anxious/Depressed) to .67 (Sleep Problems). The syndrome scales are combined to yield the Internalizing, Externalizing, and Total Problems scales. The borderline clinical range for these global scales includes T-scores ranging from 60 to 63, while T-scores greater than or equal to 64 are considered to be in the clinical range. Test-retest reliability coefficients for Internalizing, Externalizing and Total Problems scales were high (*r* = .90, .87, and .90, respectively). Inter-rater agreement on the global scales was reported to range from *r* = .59 (Internalizing) to .67 (Externalizing). All of the scale scores have been shown to be stable over a 12-month period, with a mean *r* = .55. Therefore, the CBCL/1 ½ -5 appears to be a fairly stable measure of children's behavior as reported by parents, and it has adequate to high reliability on both the syndrome and problems scales.

Evidence for the content validity of the CBCL/1 ½ - 5 is based on the validity of the CBCL/2-3 version. Epidemiological findings, consultations with practitioners, researchers, and parents of preschoolers, as well as reviews of previous research were used to establish the content validity of the CBCL/2-3 version, details of which can be found in the published manual (Achenbach, 1992). Achenbach and Rescorla (2000) reported criterion-related validity data for the CBCL/1 ½ -5 using the association between raw scale scores and independently judged referral status. Using Cohen's (1988) criteria for effect sizes in multiple regressions, the authors found significant

effects, ranging from small to medium in size, for the scales' ability to discriminate between demographically similar referred and non-referred children. Furthermore, the proportion of referred children who scored in the borderline clinical and clinical ranges was significantly greater than the proportion of non-referred children.

Achenbach & Rescorla (2000) reported the construct validity of ASEBA Problem scales can be inferred from the evidence supporting the construct validity of the CBCL/2-3 using correlation analyses with other measures of problems among preschoolers. For example, they reported correlations ranging from .56 to .77 between the Total Problems scores on the CBCL/2-3 and the Behavior Checklist (BCL) developed in England (Richman, 1977; Richman, Stevenson, & Graham, 1982). In addition, the CBCL/1 ½ -5 Total Problem score at ages 2 and 3 were significantly correlated to Total Problem scores from ages 4 through 9 ($r$ = .55-.75). Longitudinal correlations for Externalizing and Internalizing Problem scores were also significant at the same time intervals and alpha levels. However, longitudinal correlations for the syndrome scales were variable, with Aggressive Behavior scores correlating consistently across time and scores on other scales, such as Somatic Problems and Attention Problems, being less consistently correlated across time.

*The Eyberg Child Behavior Inventory (ECBI).* This measure was used to measure parent's perceptions of children's problem behaviors. It was used to describe the sample and was included in exploratory correlation analyses to examine the relation between parent-reported child problem behaviors and coded child behaviors. The ECBI (Eyberg & Pincus, 1999) is a 36-item parent-report questionnaire that measures the number and intensity of various problem behaviors. In addition, the inventory provides an indicator of

how problematic parents view their children's behaviors. Intensity ratings are based on a 7-point scale and yield an overall Intensity score, which can range from 36-252. In addition, for each behavior item, parents respond "yes" or "no" to the question, "Is this behavior a problem for you?" The number of "yes" responses yields a Problem score, which can range from 1-36. The authors reported reliability and normative data on the measure with a sample of children aged 2 to 12. The instrument was found to have high levels of internal consistency for both the Intensity and Problem scales. For children aged 2 to 6 years, Chronbach's alpha coefficient was .94 for the Intensity scale, and Kuder-Richardson formula 20 was .93 for the Problem scale. In the current sample, Chronbach's alpha coefficient was .89 for the Intensity scale and Kuder-Richardson formula 20 was .91 for the Problems scale. According to the test manual, test-retest correlations for the Intensity and Problem scales were .86 and .88, respectively, using a 3-week interval.

The construct validity of the ECBI has been demonstrated with samples of younger (i.e., ages 3-5 years) and older (i.e., ages 4-16) children in various studies. Significant correlations have been found between scores on the Intensity and Problems scales and observational measures of child negative affect, nonacceptance, and dominance. Convergent and divergent relationships in the expected directions were also shown between the ECBI scales and a widely used measure of temperament. Furthermore, ECBI scores have been shown to be significantly correlated with scores on the Child Behavior Checklist and Parenting Stress Index (Eyberg & Pincus, 1999).

*Parenting Stress Index—Short Form (PSI/SF).* Each parent completed the Parenting Stress Index—Short Form (PSI/SF) (Abidin, 1995) to provide descriptive information about the parent-child relationship. The PSI/SF is a paper-and-pencil self-

report measure that contains 36 items directly derived directly from the full-length test. It requires approximately 10 minutes to complete, and respondents indicate their level of agreement with each item by circling a number from 1 to 5 associated with answers ranging from "strongly agree" to "strongly disagree." The full-length PSI has been found to have good internal consistency with alpha coefficients ranging from .70 to .83 for the subscales of the Child Domain and from .70 to .84 for the subscales of the Parent Domain (Abidin, 1995). In the current sample, Chronbach's alpha for the Total PSI scale was .84. The construct and predictive validity of the full-length PSI has been demonstrated in many studies of child behavior problems (e.g. Kazdin, 1990; Webster-Stratton, 1988).

The PSI/SF contains three subscales labeled Parenting Distress (PD), Parent-Child Dysfunctional Interaction (P-CDI), and Difficult Child (DC). A Total Stress score is also found. Reliability data are available for the short form; however, each scale's validity must be inferred from its relations to the full-length scores. The PD subscale indicates the level of stress a parent experiences in his or her role as a parent. Test-retest reliability for this subscale was $r$ = .85, and it was strongly correlated with the Parent Domain score of the full-length PSI ($r$ = .92). The P-CDI subscale indicates the degree to which parents perceive their interactions with the target child to be unrewarding. The P-CDI subscale test-retest reliability was $r$ = .68, and it was correlated with both the Child Domain ($r$ = .73) and the Parent Domain ($r$ = .50), as it contains items from both full-length scales. The DC subscale indicates the presence of child behavioral characteristics that make the child either easy or difficult to manage. Test-retest reliability was $r$ = .78, and it was highly correlated with the Child Domain score of the full-length PSI ($r$ = .87) (Abidin, 1995).

*Coding System.* The Oklahoma State University Child Behavior Lab Behavioral Coding Manual was revised to meet the needs of the current study and used to train coders. The parent behaviors coded included: directives (D), interaction (I), praise (PR), positive touch (PT), neutral touch (NT), and physical prompts (PP). Directives include parental directions or instructions to the child regarding play behavior. Interactions are comprised of conversational statements and questions, while Praise includes specific positive verbal feedback to the child regarding his/her behavior. Positive touch includes any gesture of affection initiated by the parent, and neutral touch includes other types of parent-initiated touching behaviors, such as tapping the child's shoulder to gain his/her attention or adjusting the child's clothing or hair. Physical prompts are instances of physical guidance given to encourage compliance with directives. Please refer to Appendix A for more details regarding specific definitions in the parent code.

Coders also recorded child behaviors, which included appropriate play (AP), solicitation for parent's attention (SA), negative affect (NA), and leaving the area (LA). Solicitation for Attention includes verbal and nonverbal attempts to gain the mother's attention, such as calling her name or tugging on her arm. Negative affect includes whining, yelling, crying, and tantrums, and leaving the area occurs when children leave the boundaries of the play area. Appendix B includes specific definitions included in the child code.

*Materials*

Constructive toys, including block sets (plastic and wooden), crayon/markers and paper, a wooden children's tool set, a pair of Mr. Potato Heads ™, plastic jungle and farm animal sets, a set of foam alphabet letters, a magnetic drawing board, and books and

puzzles were variously assigned to three standard sets of toys. A video camera was used to tape the procedures, and the room was equipped with a table and chair. A bug-in-the-ear device was used to provide instructions to parents during the experimental procedures. A small snack was available during the break between each procedural condition.

*Design and Procedure*

A within-subjects design was implemented with two levels of reinforcement strategy: verbal reinforcement and nonverbal reinforcement. The order of presentation of conditions was counterbalanced across participants. In each condition, parents used the designated reinforcement strategy while their children played independently. In the verbal reinforcement strategy condition, parents gave verbal positive feedback to their children in the form of praise statements, and in the nonverbal reinforcement strategy condition parents gave their children nonverbal positive feedback in the form of physical affection.

The procedure began with 10 minutes of interactive free play with the parent-child dyad seated on the floor in the laboratory. Toys for all portions of the procedure were standardized. During the interactive free play, blank paper and crayons, two Mr. Potato Heads ™, and wooden block and tool sets were available. At the end of the interactive free play, the parent and child were given a brief break in the anteroom of the laboratory. During the break, parents received instructions to prepare them for the next activity, and they were given paperwork consisting of the behavioral measures and demographic form. New sets of toys were set out in the playroom, and at the beginning of each experimental condition, the parent and child were given a brief period of time to

explore the toys together on the floor. After 1 to 2 minutes, the parent received a standardized set of instructions to begin the independent play task. The instructions were as follows: “I need to do some work now. I need you to stay here and play while I do my work over there (points to a desk facing away from the child).” The parent then took the behavior measures over to the desk and completed them while the child played in the designated area on the floor. The parent’s desk was set approximately 1-2 feet from play area.

Each condition lasted 15 minutes. Two sets of toys were used and counterbalanced across conditions. One of the sets of toys included a large coloring pad and washable, non-toxic markers, Duplo ® blocks, and a set of jungle animals. The other set of toys included a Magnadoodle ™, a foam alphabet mat, and a farm animal set. A set of books and puzzles were also available to the child during both conditions. Toy sets were counterbalanced across conditions.

In addition to receiving instructions for each reinforcement strategy, parents received instructions to move around the room and perform other brief tasks in order to create opportunities for them to give the children positive reinforcement as they passed by the children on their way back to the desk. All other instances of positive reinforcement occurred with the parents remaining in their chair. The rationale for incorporating parental movement around the room was to create a more naturalistic scenario that would be similar to a situation at home when the parent is completing various tasks while the child plays alone; however, parents were only prompted to perform these brief, out-of-seat tasks when children were engaged in appropriate play. Parents also received instructions to follow a few rules during the experimental

conditions. These rules included: a) remaining seated at the desk or otherwise standing and walking as instructed but not getting on the floor with the child; b) not allowing the child into one's lap; and c) saying only the words they are instructed to say via the bug-in-the-ear device. Parents received instructions to refrain from responding to the children if they approached the parents or talked to the parents from across the room. During the experimental procedure, when it was appropriate, parents were given reminders about these rules via the bug-in-the-ear.

In the verbal reinforcement condition, parents received instructions to deliver brief praise statements about the child's activities. Praise statements came from a predetermined list of statements and included comments, such as "Good job playing by yourself," "I'm glad you're playing so nicely," and "That looks great!" Many of the praise statements included a combination of standardized wording with spontaneous words that were based on the child's activity. For example, a standard phrase was: "Great job with…" with the remainder of the statement based on the child's play at the moment, such that it could become, "Great job with the colors," or "Great job with the blocks," depending on what the child had chosen to play. Praise statements were only given if and when the child was engaged in appropriate play, according to the observational coding system definition of appropriate play. As long as children were engaged in appropriate play, parents received prompts to deliver praise statements once per 1-minute interval.

During the nonverbal reinforcement condition, parents received instructions to use brief, nonverbal positive touches. These touches included light pats, brushes, and squeezes on the child's head, shoulder, and back. A list of specific touches guided which prompts parents received to provide the nonverbal positive feedback, omitting any that

the parent had identified as typically bothersome to the child. Between each condition, the parent-child dyad moved into the anteroom of the laboratory where a snack and books were available.

If children did not exhibit appropriate play for more than one minute, the parent was told to remind the child to “Keep playing." A maximum of 4 cued directives to continue playing was allowed. In cases when the child had not exhibited appropriate play for more than 3 consecutive one-minute intervals, the parent subsequently received instructions to deliver reinforcement at a more frequent rate so that the manipulation could be sufficiently implemented. When increasing the rate of reinforcement, instances of reinforcement were delivered at least 20 seconds apart such that a maximum of 2 praises or positive touches were delivered in any given one-minute interval. A minimum number of praises/positive touches per minute was not set; however, at least 4 instances of reinforcement during each of the experimental conditions was required for inclusion in the analyses.

All parents were offered modest material incentives (e.g., coupons/gift certificates to local vendors), and children were given a book or a small toy for their participation. In addition, all parents were offered a typed report of the results of their children’s language screening, as well as the results of the study.

*Observational coding.* Undergraduate research assistants were trained as coders to use the Oklahoma State University Child Behavior Lab Coding Manual and completed coding for approximately two-thirds of the sample. Coder training involved didactic and interactive activities and was continued over the 2005 spring and summer semesters until coders demonstrated consistent levels of reliability greater than or equal to kappa

coefficients of .80 for the majority of the coded behaviors. Inter-rater reliability on experimental data was closely monitored on a weekly basis. In addition, weekly quizzes were administered to address areas of concern and refresh coders on coding rules. Furthermore, two test tapes with master codes were used to check for observer drift. When the undergraduate research assistants completed their coding commitment, a graduate student in the lab was trained to help complete coding for the remaining portion of the sample with the author of the study.

Coders watched videotapes of parent-child dyads and recorded behaviors in 10-second intervals for all phases of the experiment. To optimize coder reliability, a rechecks procedure was implemented for all experimental data, such that each coder had the opportunity to correct errors in intervals where initial disagreements were found. After all segments of the experiment were coded by two coders, an independent observer marked the intervals in which there were disagreements by comparing the coding sheets on which each coder recorded their observations. Coders then independently reviewed intervals containing disagreement(s) and made corrections to their coding sheets if necessary. Inter-rater reliability was calculated for 100% of the sample, which involved having each participant's behaviors coded independently by two coders.

*Data Tabulation.* Data generated from the coding procedures were tabulated in various ways. Discretely coded parent and child behaviors (i.e., behaviors coded multiple times per interval) were tabulated for the following: duration of behavior (based on the number of intervals across which a new instance of behavior occurred), the number of intervals containing the behavior, the number of new instances of the behavior, the mean duration of the behavior, and the percent of intervals during which behaviors occurred.

Parent and child behaviors coded continuously (i.e., only once per interval) were tabulated to measure the percent of intervals in which such behaviors occurred.

For the behaviors coded multiples times per interval, data were inspected to determine the most appropriate measure for use in analyses. In other words, descriptive statistics (i.e., minimums, maximums, means, and standard deviations) for each type of tabulated data (i.e., duration, number of intervals, number of new instances, mean duration, and percent of intervals) were visually compared to determine whether any of the behaviors were characterized by relatively high frequency of occurrence or relatively long duration of occurrence. None of the behaviors met these criteria, as the number of new instances was usually one per interval and the average duration of behaviors was approximately 10 seconds. Therefore, percent of intervals in which behaviors occurred was selected for use in statistical analyses.

# CHAPTER IV

# RESULTS

*Inter-rater reliability.* Reliability was calculated using kappa coefficients for parent and child behaviors collapsed across the entire sample. With the exception of two low base rate behaviors, all behaviors were coded with high levels of reliability. Table 1 shows kappa values for each coded behavior. Percent agreement for seconds of speech was 98.1%.

Table 1

*Kappa Values for Coded Behaviors*

| Parent Behaviors | kappa | Child Behaviors | kappa |
|---|---|---|---|
| Directives | .91 | Leaving the Area | .99 |
| Interaction | .97 | Solicitation for Attention | .88 |
| Praise | .96 | Appropriate Play | .94 |
| Positive Touch | .96 | Negative Affect | .88 |
| Neutral Touch | .59 | | |
| Physical Prompt | .73 | | |

*Manipulation check.* Means and standard deviations of parent behaviors observed during interactive free play and the experimental conditions are presented in Table 2. Except for seconds of speech, data reflect the average percent of intervals in which each

behavior occurred. The seconds of speech data are averages of the cumulative seconds during which parents engaged in coded verbalizations during each phase.

Based on the manipulation planned, observational data were expected to indicate differential rates of praise and positive touch across experimental conditions. Specifically, with proper manipulation of the independent variable, praise was predicted to be significantly higher in the verbal condition and positive touch was predicted to be significantly higher in the nonverbal condition. As predicted, one-tailed dependent *t*-tests comparing the verbal and nonverbal reinforcement conditions yielded significant differences in praise, $t(35) = 25.37$, $p < .001$, and positive touch, $t(35) = -20.38$, $p < .001$.

Table 2

*Means (SD) of Parent Behaviors in Each Condition*

| | Free Play | Verbal | Nonverbal |
|---|---|---|---|
| Directives | 20.83 (14.93) | 3.87 (2.11) | 4.21 (2.69) |
| Interaction | 86.16 (14.43) | 5.97 (2.51) | 6.13 (2.54) |
| Praise | 20.62 (9.80) | 15.91 (3.79) | 6.13 (2.54) |
| Positive Touch | 2.37 (4.13) | 0.76 (1.67) | 15.83 (3.96) |
| Neutral Touch | 1.06 (1.91) | 0.15 (0.66) | 0.15 (0.47) |
| Physical Prompt | 0.09 (0.38) | 0.55 (1.74) | 1.02 (2.69) |
| Seconds of Speech | 287.61 (64.43) | 76.78 (16.34) | 44.83 (16.06) |

Furthermore, the procedures were planned to hold all other parent behaviors constant to avoid potential confounds of the independent variable. Thus, it was also expected that directive and interaction would be comparable across experimental

conditions. As planned, there were no significant differences in directive or interaction, $t(35) = -.67$, $p = .51$ for directive and $t(35) = -.32$, $p = .75$ for interaction. These comparisons demonstrate the manipulations were delivered as intended with all other parent behaviors held constant.

*Main analyses.* Means and standard deviations of child behaviors are presented in Table 3.

Table 3

*Means (SD) and Ranges of Child Behaviors in Experimental Conditions*

| | Verbal | | Nonverbal | |
|---|---|---|---|---|
| | Mean (SD) | Range | Mean (SD) | Range |
| Leaving the Area | 4.83 (9.81) | 0.00 – 45.56 | 3.38 (6.01) | 0.00 – 28.80 |
| Solicitation for Attention | 25.04 (18.57) | 0.00 – 75.56 | 29.94 (17.39) | 0.00 – 61.10 |
| Appropriate Play | 83.85 (19.59) | 26.67 –100.00 | 82.90 (14.43) | 54.40 –100.00 |
| Negative Affect | 8.60 (13.45) | 0.00 – 58.89 | 9.71 (12.67) | 0.00 – 52.20 |

*Note.* All data reflect percent of intervals in which behaviors occurred.

The child data indicate children were engaged in the play task but with relatively wide-ranging levels of non-play behaviors. One-tailed dependent *t*-tests comparing the verbal and nonverbal reinforcement conditions indicated no significant differences in child behaviors. Thus, the hypothesis predicting increased solicitation for attention, decreased appropriate play, and increased negative affect during the verbal reinforcement condition was not supported.

Due to observations that some children appeared to exhibit less appropriate play and increases in other behaviors during the last halves of the experimental conditions, child behaviors were also tabulated for each half of the experimental manipulation phases. The means and standard deviations of child behaviors within each half of the experimental conditions are shown in Table 4.

Table 4

*Means (SD) of Child Behaviors in Each Half of Experimental Conditions*

| | Verbal | | | Nonverbal | | |
|---|---|---|---|---|---|---|
| | Total | First Half | Second Half | Total | First Half | Second Half |
| LA | 4.8 (9.8) | 2.2 (5.3) | 6.8 (15.9) | 3.4 (6.0) | 2.0 (5.9) | 4.6 (8.6) |
| SA | 25.04 (18.57) | 23.82 (17.05) | 26.54 (25.01) | 29.94 (17.39) | 25.65 (15.25) | 34.81 (23.22) |
| AP | 83.85 (19.59) | 88.03 (16.14) | 79.08 (26.63) | 82.90 (14.43) | 87.78 (13.95) | 76.29 (21.88) |
| NA | 8.60 (13.45) | 6.17 (12.89) | 11.04 (19.54) | 9.71 (12.67) | 5.92 (8.02) | 13.58 (21.14) |

*Note*. LA = Leaving the Area; SA = Solicitation for Attention; AP = Appropriate Play; NA = Negative Affect

One-tailed dependent *t*-tests indicated there were several differences in child behaviors between the first and second halves within each experimental condition. Within the verbal reinforcement condition, there was a significant difference in rate of appropriate play, $t(35) = 2.58$, $p = .007$; however, no differences were found for solicitation for attention or negative affect. Appropriate play was also significantly different in each half of the nonverbal reinforcement condition, $t(35) = 3.06$, $p = .002$.

Within the nonverbal reinforcement condition, there were also significant differences for solicitation for attention, $t(35) = -2.55$, $p = .008$, and negative affect, $t(35) = -2.64$, $p = .006$.

Because there were changes in rates of child behavior across time, analyses compared the two conditions using data only from the second half of each condition. Although the rates of solicitation for attention and negative affect appeared somewhat higher in the second half of the nonverbal reinforcement condition compared to the second half of the verbal reinforcement condition, one-tailed dependent *t*-tests indicated no statistically significant differences between the latter halves of the conditions.

*Effect Sizes.* Effect sizes were calculated for solicitation for attention, appropriate play, and negative affect based on the observational data from the full experimental conditions. Calculations were based on Cohen's (1988) effect size *d* using the *t* test on dependent samples (p. 48). Please see Appendix C for details regarding the formula and calculations. The results indicated an effect size of .23 for solicitation for attention; .04 for appropriate play; and .06 for negative affect. All of these represent small effect sizes.

*Parent-Report Measures.* Parents completed measures for descriptive purposes, as well as to provide indices of children's problem behaviors for exploration in correlation analyses with observed child behaviors under experimental conditions. Please refer to Table 5 for a descriptive summary of scores on the ECBI scales. Most scores were within normal limits, suggesting generally low levels of problem behaviors in the sample.

Table 5

*Means (SD), Ranges, and Clinical Significance of ECBI Scores*

| | Mean (SD) | Range | Percentage Clinically Significant |
|---|---|---|---|
| ECBI Intensity scale | 110.2 (20.6) | 68-161 | 11.1 |
| ECBI Problem scale | 7.1 (6.7) | 0-34 | 8.3 |

*Note.* Cut-off for clinical significance on Intensity scale = 131; Cut-off for clinical significance on Problem scale = 15

Refer to Table 6 for a descriptive summary of the CBCL Syndrome scales and Table 7 for a descriptive summary of the CBCL Problems scales.

Table 6

*Means (SD), Ranges, and Clinical Significance of CBCL Syndrome Scales Scores*

| | Mean (SD) | Range | Percentage in Borderline – Clinical ranges |
|---|---|---|---|
| Emotionally Reactive | 55.5 (6.3) | 50-69 | 13.9 |
| Somatic Problems | 56.4 (7.6) | 50-72 | 25.0 |
| Anxious/Depressed | 53.1 (4.2) | 50-69 | 2.8 |
| Withdrawn | 53.9 (5.4) | 50-67 | 5.6 |
| Attention Problems | 53.3 (4.6) | 50-67 | 5.6 |
| Aggressive Behaviors | 53.1 (4.0) | 50-64 | 0.0 |
| Sleep Problems | 57.2 (9.1) | 50-94 | 13.9 |

*Note.* Borderline clinical range T = 65 -69 and Clinical range T ≥70

Table 7

*Means (SD), Ranges, and Clinical Significance of CBCL Problems Scales Scores*

| Problem Scales | Mean (SD) | Range | Percentage in Borderline – Clinical ranges |
|---|---|---|---|
| Internalizing Problems | 51.4 (10.4) | 29-71 | 13.9 |
| Externalizing Problems | 50.4 (6.6) | 32-65 | 2.8 |
| Total Problems | 51.5 (8.7) | 30-66 | 8.4 |

*Note*. Borderline clinical range T = 60-64 and Clinical range T ≥ 65

All CBCL scores are reported as T-scores. Most of these scores were within normal limits. The highest scores were found on the Emotionally Reactive, Somatic Problems, and Sleep Problems scales. The Emotionally Reactive and Somatic Problems scales load onto the Internalizing Problems and Total Problems scales, while the Sleep Problems scale loads only onto the Total Problems scale. Overall, the current sample generally demonstrated non-clinical levels of problem behaviors.

*Correlation analyses.* Exploratory correlation analyses were conducted with outcomes on the parent-report measures and observed child behaviors. Although there is a notable amount of shared variance among the behavior measures, the correlation analyses did not control for any overlapping variance. This approach was chosen, because the correlations were conducted for exploratory purposes only, and they represent a unique examination of potential relations between child behavior problems and observed child behavior during an independent play task.

Based on the logic that children with emotional and attention problems might have particular difficulty with the independent play task, correlations between observed

child behaviors and four of the CBCL scales were conducted. Children's scores on the emotional reactivity, anxious/depressed, withdrawn, and attention problems scales were used. These scales were chosen because they represent narrow indicators of the types of problems which seemed most likely to have implications for children's responses to the independent play task. Table 8 presents correlations for these variables. Correlations were calculated using the measures of children's behavior over the entire experimental conditions (i.e., not half-phases).

Table 8

Relations of Observed Child Behaviors with CBCL Syndrome Scales

| | Emotionally Reactive | Anxious/ Depressed | Withdrawn | Attention Problems |
|---|---|---|---|---|
| NV-NA | .30 | .35* | .32 | .03 |
| NV-SA | .22 | .18 | .22 | -.09 |
| NV-AP | -.08 | -.12 | .04 | -.01 |
| PR-NA | -.30 | -.26 | -.30 | .01 |
| PR-SA | -.21 | -.18 | -.06 | -.22 |
| PR-AP | .38* | .30 | .36* | .05 |

Note. * $p < .05$ NV = nonverbal reinforcement condition; PR = verbal reinforcement condition; NA = negative affect; SA = solicitation for attention; AP = appropriate play

The significant correlations suggest a very modest, positive association between anxious/depressed symptoms and negative affect in the nonverbal reinforcement condition. In addition, a positive relation was found between appropriate play in the

verbal reinforcement condition and two measures of internalizing problems. Specifically, the Emotionally Reactive and Withdrawn scales were positively associated with appropriate play in the verbal condition.

However, the variables selected for initial exploratory analyses may have been too narrow in their measures of problem behaviors to adequately determine possible relations, especially with respect to externalizing types of problem behavior. Thus, additional analyses were conducted with broader measures of problem behaviors, including the ECBI scales and the Internalizing, Externalizing, and Total Problem scales from the CBCL. Table 9 presents the results of these additional analyses.

Table 9

Relations of Observed Child Behaviors with Broad Measures of Behavior

| | ECBI Intensity | ECBI Problem | CBCL Int. Prob. | CBCL Ext. Prob. | CBCL Tot. Prob. |
|---|---|---|---|---|---|
| NV-NA | .41* | .19 | .27 | .29 | .39* |
| NV-SA | .15 | -.04 | .10 | .02 | .11 |
| NV-AP | -.23 | -.09 | -.08 | -.14 | -.18 |
| PR-NA | .14 | -.14 | -.35* | .16 | -.13 |
| PR-SA | .00 | -.21 | -.27 | -.08 | -.25 |
| PR-AP | -.10 | .31 | .43* | -.07 | .21 |

Note. * $p < .05$ NV = nonverbal reinforcement condition; PR = verbal reinforcement condition; NA = negative affect; SA = solicitation for attention; AP = appropriate play; Int. Prob. = Internalizing Problems Scale; Ext. Prob. = Externalizing Problems Scale; Tot. Int. = Total Problems Scale

The correlations between children's observed behaviors and broader measures of problem behaviors indicate that, in the nonverbal reinforcement condition, negative affect was positively related to problem behaviors measured by the ECBI Intensity scale, which measures externalizing types of behavior. Negative affect in the nonverbal reinforcement condition was also related to the CBCL Total Problems scale, which includes measures of internalizing and externalizing, as well as other types of problem behavior (i.e., sleep problems).

In the verbal reinforcement condition, the correlation between negative affect and the broad measure of internalizing problem behaviors was significant; however, the direction of association was in the opposite direction of the relation found between the anxious/depressed syndrome scale (an internalizing cluster of symptoms) and negative affect in the nonverbal reinforcement condition. That is, higher overall levels of internalizing behaviors were associated with lower rates of negative affect in the verbal reinforcement condition, whereas higher ratings on the anxious/depressed scale were related to higher levels of negative affect in the nonverbal reinforcement condition. In addition, overall levels of internalizing behaviors were positively related to appropriate play in the verbal reinforcement condition.

# CHAPTER V

# DISCUSSION

## *Summary and Implications of Findings*

The present study represents a laboratory-based investigation of two different types of positive reinforcement used to encourage children's independent play behavior. The findings indicated no significant differences between the verbal and nonverbal reinforcement strategies compared. Thus, the assertion made by Christophersen and Mortweet (2003) that nonverbal positive feedback is superior to verbal positive feedback for encouraging independent play was not supported. In fact, both praise and physical affection appeared to be equally effective in reinforcing children's behavior during the independent play task in the lab. Alternatively, it is possible that neither strategy reinforced independent play during the experimental conditions, which would lead to the conclusion that the two strategies were equally non-reinforcing. Nevertheless, children's behaviors were not significantly different between the two conditions, which suggests, until further evidence indicates otherwise, advice to parents should reflect the conclusion that either strategy would be appropriate and could be used interchangeably. Furthermore, it seems parents who have a particular preference or situational need should be able to select whichever method feels most comfortable or is most convenient to them and not expect significant differences in children's responses based on the strategy they select.

Opposing the suggestions of Christophersen and Mortweet (2003), parents of children in this age group may actually prefer and rely more heavily upon the verbal strategy in their natural environment, as it is more consistent with parenting approaches that foster rapidly developing language skills in preschoolers. In fact, a number of mothers in the current study commented that it was difficult to have no verbal interactions with their children during the nonverbal reinforcement condition. However, if children were not navigating a period of development so dominated by the use of language, it is possible different results would have been obtained.

Thus, it is possible the current study did not capture the conditions under which differences between the two strategies might be found. For example, perhaps only older children would exhibit differential responses to contingent praise and affection. Furthermore, the design of the current study could not include certain components of the approach outlined in Christophersen and Mortweet (2003), such as the shaping procedures they suggest using to gradually extend the length of time a child is left alone to play. It is certainly possible that children who would benefit from the shaping procedures might also exhibit differences in their responses to contingent praise and affection.

In addition, it is important to highlight that the current study was designed to detect moderate effect sizes. Thus, if differences actually do exist between the two reinforcement strategies they may have been too subtle to detect with the current design. Furthermore, it is possible differences would have emerged if the study conditions had allowed for greater exposure to each reinforcement strategy. For example, repeated trials

of each condition or extended durations of exposure to conditions may result in significant differences between the two strategies.

In fact, informal observations of children suggested some struggled more with the demands of independent play near the end of experimental conditions. Follow-up analyses conducted to explore this observation indicated significant differences in children's independent play behavior (i.e., appropriate play) within each condition, suggesting children played independently at significantly lower rates during the latter halves of the time periods they were expected to play, regardless of reinforcement strategy being used. Other interesting findings indicated significantly more attempts to gain the mothers' attention and increased expressions of negative emotion during the second half versus the first half of the nonverbal condition.

The implications of these findings support the speculation that if experimental conditions involved longer time periods for each condition, or if children's behaviors could be observed over multiple exposures to the same conditions, a significant difference in the two strategies might be detected. Alternatively, a longer experimental session may not be developmentally appropriate. Specifically, children's abilities to play independently might have been maximized in the current study, suggesting that an extension of the experimental conditions would risk confounding results with the effects of fatigue.

A considerable amount of background information regarding childhood temperament and its relation to behavior problems provided a rationale for exploring individual differences in the current study. The results of the exploratory correlation analyses suggested children's problem behaviors should be considered in the

interpretation of the results regarding the efficacy of verbal and nonverbal reinforcement in strengthening independent play skills. Specifically, patterns of externalizing and internalizing behavior problems were related to various child outcomes during experimental conditions. Externalizing problem behaviors, as measured by the intensity score on the Eyberg Child Behavior Inventory (Eyberg & Pincus, 1999), and internalizing behaviors, as measured by the Anxious/Depressed scale of the Child Behavior Checklist (CBCL) (Achenbach & Rescorla, 2000) were related to the overall rate of negative affect in the nonverbal condition. In addition, internalizing behaviors reported on the CBCL were positively related to overall rates of children's appropriate play and inversely related to the overall rate of negative affect during the verbal reinforcement condition. Although the relations identified should be considered preliminary, as no error correction procedures were employed, they provide support for the conclusion that individual differences may play an important role in children's responses to parents' attempts to encourage independent play skills.

Based on these correlations, it seems plausible that young children with clinically or borderline significant externalizing behaviors or anxiety/depression might demonstrate differences in their affective responses to the two reinforcement strategies. Christophersen and Mortweet (2003) emphasize the importance of ensuring the positive nature of independent play. Thus, the impact of reinforcement strategy upon children's affect would be important to the success of any targeted attempts to foster independent play skills. Furthermore, the fact that children's negative affect was not related to indices of behavior problems in the verbal reinforcement condition leads one to question whether there is something about praise that helps certain children regulate their emotional and/or

behavioral responses. The relations found between internalizing behavior and observed child behaviors in the verbal reinforcement condition (i.e., positive association with appropriate play, negative association with solicitation for attention) seem to provide additional support for this possibility. Taken together, all of the significant correlations provide a rationale for the idea that positive comments from parents during independent play may help prevent children from escalating in their levels of frustration by providing frequent messages which contain explicit positive emotional content.

Informal observations of children's reactions to the nonverbal reinforcement strategy also provide anecdotal information which suggests parents should consider individual differences in children's comfort levels with physical affection versus verbal praise. Although most children appeared equally comfortable with both reinforcement strategies, the experimenter noted stark differences in a small number of children's reactions to parents' gestures of affection. Overall, various child reactions included indifference, curiosity/confusion, anticipation and apparent enjoyment, and marked irritation. One memorable moment occurred when a child became so bothered by the physical affection that he finally held out his hand as his mother approached and commanded her with a firm, "No!" Nonverbal positive feedback clearly did not appear to be reinforcing for this child. In contrast, another child was observed to look toward her mother in anticipation of the physical attention and silently smiled with pleasure as she received her mother's affection. Therefore, a logical implication of these observations is that if a child responds with a strong negative reaction to either positive feedback strategy it would probably be more useful to try an alternate approach.

*Strengths and Limitations*

In spite of the fact that the study hypotheses were not supported, there are several strengths of the current investigation. The design was highly controlled, as evidenced by experimental manipulation checks and inclusion of counterbalancing procedures, resulting in good internal validity. Also, high rates of inter-rater reliability were achieved for the observational measures included in the main analyses, which indicates the results obtained were based on legitimate, standardized data.

The sample was comprised of parents from the community with children who exhibited typical development, which appeared to include ongoing mastery of autonomy. In addition, the range of behaviors observed indicated the demands of the experimental task were age-appropriate. Furthermore, the experimental setting provided a situation that reflected common experiences at home or in the community when parents must complete important tasks which require most or all of their attention for at least a 15-minute period. During recruitment and consent procedures mothers indicated high levels of interest in the study topic in general, and some of them expressed how relevant it was to their daily lives. Thus, there was some support for the ecological validity of the study.

However, certain aspects of the experiment limit the extent to which results can be generalized. Although the majority of the children studied demonstrated fairly well-developed independent play skills in the laboratory, it is possible they would exhibit differences in their responses to the reinforcement strategies if they were observed in a different setting. Specifically, it is possible children exhibited similar behaviors in each condition due to the physical arrangement of the laboratory or the novelty of their

surroundings, whereas the specific environmental conditions and/or familiarity in their own homes might induce differences in the effectiveness of the strategies used.

It is also important to consider how the results may have been influenced by procedural artifacts through the manipulation of all parent behaviors during the experimental conditions. The use of ignoring during experimental conditions, which was required to maintain experimental control of parent behaviors, is of particular interest. Anecdotally, some mothers indicated they did not typically ignore their children's bids for attention. The observations of interactive free play indicated parents provided a good deal of directive instructions and guidance to their children, whereas they were restricted in their use of these strategies during the experimental conditions. Minton, Kagan, and Levine's (1971) study of mother-child interactions in the home environment indicated mothers interacted with their children every few minutes during unstructured, naturalistic daily life. In their study, mother-child interactions were often initiated either because the mothers gave reprimands for minor misconduct or because children wanted something from the mother. They also found mothers were likely to grant children's' requests about half the time. Their findings provide additional evidence in support of the conclusion that mothers are likely to maintain a relatively high level of engagement with their children in their natural environment. Thus, it is possible the current laboratory results were influenced by children's reactivity to parental ignoring and/or the lack of direction from parents, both of which were held constant across experimental conditions.

Christophersen and Mortweet (2003) do not provide any recommendations for how to handle children's attempts to interact when they are supposed to be playing independently. However, it is possible that differences in the reinforcement strategies

could be detected if parents used more frequent redirection to the play activities (and consequently, less ignoring) than was permitted in the current procedures. At this point, the conclusion that no differences exist between the two strategies can only be generalized to conditions similar to those implemented in the study (i.e., differential reinforcement of independent play with limited directions/reminders and no other types of parental attention).

In addition, study conclusions can only be generalized to populations with similar characteristics as the current sample. Results indicated that all parents gave praise during the interactive free play, while physical affection was observed but much less frequently. Thus, it appears this sample was comprised of parents who relied more on the verbal reinforcement rather than nonverbal reinforcement strategy in their natural interactions. This pattern of behavior indicates it is possible the distracting nature of praise suggested by Chrisophersen and Mortweet (2003) was simply not an issue for the current sample, because children were accustomed to receiving praise at relatively high rates in their natural environments. In addition, all of the parents were very interactive during the free play activities, suggesting mothers were adept at creating a positive atmosphere and many opportunities for verbal exchanges. Therefore, it is possible parents' histories of fostering positive and highly verbal patterns of relating to their children outside of the laboratory could have been a factor contributing to the comparable levels of children's responses during each of the experimental conditions.

In terms of demographics, the current sample identified predominantly as Caucasian with an annual family income above $30,000. In addition, almost all of the mothers were married and well-educated. Furthermore, all participants were volunteers

from the community. Although recruitment strategies were diverse, the reliance on volunteers is limiting insofar as it may result in a sample with certain characteristics that other populations might not have. For example, there were few mothers who reported significant levels of parenting stress. The study is also limited by the fact that it included mothers exclusively. Recruitment strategies were not limited to mothers, but only one father expressed interest in participating and then did not keep his appointment to participate.

Overall, it must be acknowledged that a more diverse sample with paid participants might have resulted in different experimental outcomes. For example, parents with lower income and less education are typically much less verbal in their natural interactions with young children than parents with higher socioeconomic status (e.g., Hart and Risley, 1995). This difference in early parent-child relations could certainly influence children's responses to the reinforcement strategies.

The current results are mainly applicable to 2 ½ - to 3 ½ - year-old children with typical levels of behavior problems and development. In fact, all of the children who completed the receptive vocabulary test (n = 35) received scores in the normal range. Finally, boys (n = 16) and girls (n = 20) were represented in the sample almost equally, but sex comparisons were not conducted due to small sample size.

*Future Directions*

There are several considerations for future studies investigating independent play skills. First, it would be interesting to use a between-groups design with children of the same age so that longer experimental conditions could be examined. Additionally, modifications to the study procedures should address other concerns. For example, it

would be interesting to limit recruitment to only those children who exhibit lower levels of independent play. Of course, it would be important to ensure recruitment of a large enough sample to detect small effect sizes, so the cut-off for determining "lower levels of independent play" may need to be liberal. Another modification worth testing is the manner in which directives and ignoring are controlled in the experimental conditions. Rather than limiting the number of directives parents give, it would be interesting to have parents respond to each bid for attention using standardized statements and brief redirection to the toys. Using this approach might reflect parents' natural tendencies better than the current procedures while also maintaining experimental control.

Further exploration of individual differences and, specifically, how problem behaviors may interfere with the development of autonomous behaviors seems warranted. The correlation analyses suggested a positive association between negative affect during the nonverbal condition and disruptive problem behaviors, as well as anxiety/depression. Therefore, one possible direction for future research would include further investigation of differences in the effects of contingent affection versus other types of positive feedback for building skills in children with these types of behavior problems. Based on the preliminary correlation analyses, one might expect the nonverbal reinforcement strategy to result in higher levels of negative affect. The question of whether other child behaviors would show differences seems to be more open-ended. However, the relations among observed child behaviors would suggest that rates of appropriate play would be lower while solicitation for attention would be higher in the nonverbal condition for children with these behavior problems.

Eisenberg et al. (2000) found a moderating role of negative emotionality upon the prediction of externalizing behavior problems from attentional control. Thus, it would also be interesting to investigate the relation between children's attentional control and their behaviors during the independent play task. Although no correlation was found between the Attention Problems scale on the CBCL and observed child behaviors in the current study, it is possible that a measure of temperament, rather than behavioral adjustment, would be more appropriate for capturing the link between child characteristics related to the ability to play independently.

Furthermore, it seems there is great potential for linking the current methodology with the study of other various temperament constructs. Specifically, the area of research on effortful control seems particularly promising. Ruff and Lawson (1990) found that even when children's focused attention increased over time, the increase in the duration of their orientation to toys during free play was minimal. The concept of effortful control represents a broader measure of attention, which includes persistence and inhibitory control (Rothbart & Ahadi, 1994; Rothbart et al., 2001). It is possible that even as children become better at focusing on their play activities, their abilities for continuous engagement with a task and resistance to impulses, such as asking for help or giving up on a challenging problem, would significantly impact their behavior during an independent play task.

It is also important for future research to address the limits of this study, as well as issues addressed in the caveats outlined in the interpretation of results. In particular, sampling efforts should target populations the current study did not by including more ethnic minorities and children with higher levels of behavioral problems. Both of these

sampling aims could potentially be accomplished by recruiting parents from lower socioeconomic backgrounds. For young children with externalizing behavior problems, there is a question of whether it would be more appropriate and beneficial to treat the independent play task as a discipline situation, given the findings of Wahler and Fox (1980). In their study of clinically non-compliant children, decreases in problem behaviors were observed under conditions of independent play, but a time-out contingency was eventually needed to maintain behavioral improvements. Thus, research on encouraging independent play in preschool-aged children who exhibit increased problem behaviors might be enhanced by integrating discipline strategies, such as time-out, which are commonly recommended in parenting books, including Christophersen and Mortweet (2003).

In addition, children of different ages and children with developmental disabilities should be studied using procedures similar to the current study; however, modifications may be appropriate. Specifically, younger children and those with developmental delays would likely require shorter time periods in experimental conditions. Experimental investigation of the shaping procedure suggested by Christophersen and Mortweet (2003) would certainly be interesting and potentially useful with these populations. However, it may not be appropriate to design studies of the shaping procedure for the laboratory, unless the environment could closely mimic the home environment, such that mothers could easily move in and out of the child's play space. Also, because children have more difficulty separating from parents in unfamiliar environments, the shaping procedure might be more appropriately studied in the home.

For older children, it is possible that additional methods of reinforcement would need to be included, as their developmental sophistication in other areas might demand more creative and complex strategies of encouragement.

Finally, investigations of the broader importance of developing independent play skills represent an important future direction of this research. Embedded within the research on temperament and behavioral adjustment, longitudinal studies incorporating observations of children's independent play behaviors in early childhood might enhance identification of children who are at greatest risk for struggling with the demands for autonomy in the school setting. Significant findings could be used to help ensure that early interventions are targeted at those who need them the most. Conversely, another question is whether having good independent play skills predicts greater autonomy in other areas, such as academics.

Furthermore, extending this area of research into the school setting more generally would represent another potential research direction. It would be interesting to determine whether there are any differences between children's solitary play behaviors in the school setting and home settings. In addition, aside from structuring classroom play centers for solitary play, it would be interesting to determine which methods, if any, teachers use and find most successful in encouraging children's independent play endeavors. Again, the role of individual differences would seem to be an important consideration, as it is possible that children who have not developed independent play skills by preschool or kindergarten would also have other types of behavioral problems. If further research indicated any relation between the ability to play independently and other important outcomes, there would be salient implications for school interventions.

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# APPENDICES

APPENDIX A

Coding Manual—Parent Code

***Directives***

- When the parent gives a **verbal command** for the child to engage in any behavior it will be considered a directive.

- **Instructions**, or telling the child how to do something, are considered directives.
- Directives can be **explicit** (direct), such as "Pick up the toys."
- Directives can also be **implied**, as in questions or indirect commands that indicate what the parent wants the child to do, such as
  - "I need your help to do X (build, color, etc.)." (implied/indirect)
  - "Will you pick up the toys?" (question)
  - "Let's pick up the toys." (implied/indirect)
- Directives **must be words**, not just sounds (e.g., shh!)
- **Directives must be specific.** Statements that provide information or suggestions in a vague or general way are not coded as directives unless they are part of a sequencing or explanation statement given in conjunction with or immediately (i.e., < 2 sec.) before or after a specific directive.

  - A direct or indirect instruction given during interactive or independent play.
  - Directives that are implied or indirect must include a call for action.
    - Examples: "Give me the red crayon."
      "Watch me."
      "Show me."

      "Let's draw a rainbow." Or "Let's play." (active)
      BUT NOT "Let's see" (passive) or "Let's look" ("look" = special case)

      "Can you help me put this one on?" (indirect/implied)
      BUT NOT "Maybe you could put this one on." (mere suggestion)

  - Note: **DO NOT** code Directive if the question or statement does not involve a call for action, as in the following cases:
    - The statement or question is object-oriented rather than action-oriented.

        - "How about the red crayon?" (I) Versus "How about coloring with red?" (D)
    - The action word is passive rather than active.
        - "Let's pick a color." (D) Versus "Let's see what colors we have." (I)
        - "Let's look here." (I) Versus "Let's choose from these." (D)
    - The statement or question refers to the child's preference or desire.
        - "Would you like to color with red?" (I)
        - "Do you want to play with Mr. Potato Head?" (I)
    - The statement or question includes one of the following words that make it a mere suggestion: "might," "maybe," "perhaps"

- If the parent **reprimands** the child, it is considered a directive.
    - A statement of disapproval informing the child <u>WHAT NOT TO DO in the context of a misbehavior situation. Statements may be in the form of a question.</u>
        - Examples: "No, no." "Quit!"
          "No, don't touch that."
          "Don't leave."
          "Jessica!" (calling the child's name in a <u>disapproving</u> tone of voice)
    - A command or statement (may be in the form of a question) informing the child <u>WHAT TO DO</u> with regard to misbehavior.
        - Examples: "Put that down."
          "Put it back."
          "Leave it alone."
          "Stay on this side."
          "Stay over here with Mom."
          "You have to stay in here."
          "Get in here where Mom's at."
          "Come here." "Come over here." "Come back."
    - Reasons for not misbehaving, implied disapproval/discipline, or the child's name in a disapproving tone, <u>all in the context of misbehavior.</u>
        - Examples: "I need you here where I can watch you."
          "You're not supposed to do that."
          "Look at me, Joey…(followed by reprimand)"
          "One, Two, …" (counting as a warning of more serious consequences)
          "Do you want a spanking?"
          "I am busy!" (only if in a disapproving tone, otherwise, coded as I)
          "Don't take off your shoes. Your socks will get dirty." (all coded as 1 D)
          "Stop, you're going to break it."

- If the parent **shares information** with the child for the purpose of getting the child to do something or refrain from doing something, it is considered a directive.
    - Examples:

1. child is attempting to leave the play area or talking about doing something else in another room and parent says:
"The lady said we have to stay here." Or "Listen, we're going to keep playing here." ("Listen." By itself is also a directive)

2. parent is directing or redirecting child to the play activity:
"We're going to play for just a few more minutes."

3. child is doing something that parent does not want them to do:
"That is not allowed."

4. parent is referring to a specific play activity that has already begun or is going to begin in the immediate future:
"I need your help to build it." Or "I need your help to do it."

5. parent is minimally directing child but is sharing information about what is expected for the purpose of getting child to initiate the next activity:
"We have some things to do in here now." <u>BUT NOT</u> "We all have things to do."

6. parent is assisting play in a directive manner:
"That piece needs to go here instead." <u>BUT NOT</u> "That piece fits somewhere else."

## <u>CODING DIRECTIVES</u>

<u>Carryovers:</u> If a directive begins in one interval and carries over into the next interval, circle D in the first box and draw a line connecting the D in the first box to the D in the second box.

<u>Multiple directives</u>: Sometimes more than one directive is given in the same interval. Under the following circumstances they are to be coded separately:

1. More than 2 seconds occur between the last word of the first directive and the start of the repeated directive. (e.g., "Pick that up…(2.1 seconds)…Do it now" would be coded as 2 directives).
2. Another conversational element (praise, interaction) occurs between the two directives (e.g., "Don't touch…good girl…don't touch" is coded as D, Pr, D).
3. If the directives are in response to two different behaviors, they are scored separately even if two seconds does not separate them:
   a. Don't touch that (D1). You need to pick up the toys (D2)
   b. You need to come here (child has left area; D1). It's time to clean up (D2).
   c. Don't touch that (touching forbidden object; D1). Don't touch that (touching baby gate; D2).
   d. A directive statement may include a justification (i.e., how or why) or explain the sequencing or order in which one or more events will happen; however, the justification and/or explanation may be included as a

conjunction statement (i.e., a sentence using "and," "but," or "then," or it may be stated as a separate sentence. In both cases, code the directive statement, along with the justification/explanation that precedes or follows it as ONE directive.

a. For example:
    i. "We'll do that next. We're going to do this right now."
    ii. "It's time to leave. Please pick up the toys."
    iii. "First we'll color, then we'll play with the cars."
    iv. "You will use green, and I will use yellow."

**Up to three directives can be coded per interval. Do not code a 4th directive.**
Directive #1: Circle the D
Directive #2: Make a slash (/) through the D
Directive #3: Make a slash (\) through the D

**If the child leaves the area **more than once**, and the parent **responds to each with a directive**, score them as **different directives** in that interval even if there isn't a 2 second pause in between them. Example:

- Child steps across line out of area, steps back into area, then steps out again.
- Parent responds, "Jimmy, come back here" (1.5 seconds) "Jimmy!" in disapproving voice (Dl is coded twice)

**If the parent gives **2 directives without a 2-second pause** in response to the child leaving the area **once**, record them as 1 directive. Example: Child steps across line out of area; parent responds, "Jimmy! (1 second) "Come back here." (Dl is coded once)

***Praise***

- Praise is a verbalization that communicates approval <u>in response to the child's behavior</u>.
- Praise can be in the form of a statement or question. It is usually recognizable by the positive tone of voice.
    - Note: Sometimes parents describe a child's accomplishment as a way of giving praise. These descriptions should only be coded as praise if they are said in a very positive tone of voice.
- It may include verbal and nonverbal behavior.

<u>Examples of **verbal praise**:</u>

1. Good boy/girl.
2. I like the way you are picking up the toys.
3. You're picking up the toys! Good job! (all said very positively; no 2 sec. pause, coded as 1 Praise)
4. You know exactly what to do with those, don't you? (said very positively)
5. You put it in without any help! (said very positively)
6. There you go!
7. Excellent! *Or* Terrific!

8. Thank you for _____(doing a specific behavior).
9. You have good ideas. *or* That looks like a good idea
10. You've got it!
11. You're doing so well.
12. Wow! (said in response to something the child has done, not to something in the room)
13. You're doing such a good job being quiet.
14. Any praise of the dyad, e.g., We did such a great job with our picture.
15. The following should be coded praise if said in an extremely **positive tone of voice**; (if said in a neutral voice, code as I).
    - That's right!
    - That's correct!
    - Alright!
    - Thank you!
    - Look at that!
    - You did it!

    ➢ To determine if the parent's tone of voice is extremely positive, consider their level of enthusiasm, especially in comparison to the voice tone used for other verbalizations

    ➢ Tips for determining "extremely positive":
    1. Observe the level of enthusiasm in the parent's voice
    2. For the parent who is already positive/enthusiastic in most or all verbalizations, code the positively stated "thank you," or other appropriate comment, as praise.
    3. For the parent who is more neutral in their verbalizations, compare the "thank you," or other appropriate comment, to other verbalizations to determine whether or not it is positive enough to be coded as praise. (*cont'd on next page)*
        a. Judge how positive the parent is based on each individual parent's style of interacting. In other words, each parent's voice tone will be variable within each observation, so determining what is "extremely positive" will depend, in part, on how the parent sounds when he/she is interacting at other times during the observational period
        b. Therefore, "extremely positive" is likely to be different for different parents.

Examples of **nonverbal praise**:

➢ The ONLY non-verbal coded as Pr is clapping. DO NOT code "thumbs up" and "high five."

CODING PRAISE (PR)

Carryovers: If a praise begins in one interval and carries over into the next interval, circle PR in the first box and draw a line connecting the PR in the first box to the PR in the second box.

Multiple praise statements: Sometimes there are multiple praises in the same interval. Under the following circumstances they are to be coded separately:

1. More than 2 seconds occur between the last word of the first praise and the start of the second praise. (e.g., "Good job…(2.1 seconds)…That's good" would be coded as 2 praises).
2. Another conversational element (directive, interaction) occurs between the two praises (e.g., "You're a good girl…Here's one…Good job!" is coded as Pr, I, Pr).
3. If the praise statements are in response to two different behaviors, they are scored separately even if two seconds does not separate them:
    a. Good job (referring to putting in the right puzzle piece—PR1), and I like how you listened to me (PR2)
    b. P: What color is this? (I)
       C: Red
       P: Good! (PR1), [points to next color]
       C: Yellow
       P: That's right!!! (PR2)
    c. [child shows what he/she colored] Nice job! (PR1) [child colors something new on picture and shows again] That's great! (PR2)
    d. P: I like your picture (PR1).
       C: It's a horse.
       P: You're so smart. (PR2).

Up to three praises can be coded per interval. Do not code a 4th praise.
Praise #1: Circle the Pr
Praise #2: Make a slash (/) through the Pr
Praise #3: Make a slash (\) through the Pr

DO NOT code as praise any statements said in a neutral tone of voice and given for information purposes (e.g., child asks if the toys go in the bucket and the mother says, "Yes, that's right.")

***Interaction***

- **Verbal interaction** is any parental comment or statement other than that which has been defined as directive or praise.
    - This is generally in the form of chatting, asking questions, making suggestions or statements about what to play with or build, offering information, and narrating

the child's play, all of which is not related to completing any task specified during a task phase (e.g., playing while parent is occupied, sorting, picking up toys).

- Interaction also includes the parent assisting the child's play or testing the child's knowledge. Includes specific questions or statements that assist or guide play.

Examples of Verbal Interaction:

***Chatting:***

I'm going to show you some toys
A reply to a child's question, such as "What's that?" answered by "A car."
Yeah.
Oh.
Let's see or Let's see here
Please (surrounded by a 2-second pause)
Come on (stated during free play; if said with disapproving tone, code as D)
OK.
Sorry
We'll talk about that later. (not specific enough to be directive)
That's a neat toy you have.
Hey (if surrounded by a 2-second pause).
There (if surrounded by a 2-second pause).
Here (if surrounded by a 2-second pause
See or See? (if surrounded by a 2-second pause).
See all the toys on the floor/all the things on the tables.
Oops! *Or* Uh-oh!
Look, look at me, look at this, look there, look at mommy, or Oh, look

- Parents will sometimes say "Look at that" in response to something their child has built, code as praise if said in positive tone of voice
- "Can you look at me?" is coded as interaction.

***Asking questions:***

What are we going to do now? What should we build? What else do you want to build?
Do you like these blocks?
Do you want to play with the cars or the blocks?
Do you want me to help you?
What color is this?
What's this? or What's that?
We have these at home, don't we?
Would you like to do something else?

***Making suggestions or statements about what to play with or build***

Maybe the dog could drive the car (or any other statement the parent makes that provides a suggestion but does not direct the child's activity)
You could use this one.
Do you think you might need this one?
How about the red crayon? (object-oriented/no call for action)

You might want to put the nose on first.

***Offering information***
Daddy/mommy has to fill out some forms now and can't talk.
I need to fill out these forms
That doesn't fit.
I'm almost through
Yes, that's right or alright (said in neutral tone of voice for information purposes).
That is a block.
I finished this page so I only have a few left to finish.
I need to make a phone call.
There are lots of different toys on the floor.
Here's a red crayon.

***Narrating child's play***
Now you're putting the man in the truck
You're fixing it.
You put the ear in.
You drew a flower.
I see that you're playing with blocks.
You're making it go fast!
You're coloring the sky.

***Do not code non-verbal interactions, such as head nods, smiling, or other nonverbal gestures (e.g., high fives).**

CODING INTERACTION (I)

Code Interaction only once per interval when it occurs, regardless of how many statements or questions the parent says that qualify as Interaction statements/questions in each interval.

***Seconds of Speech***

After you have coded the content of parent verbalizations (i.e., Directive, Praise, or Interaction) you will mark the number of seconds per interval during which the parent was speaking.

Each interval contains a box of numbers from 0 through 9 to indicate the seconds in each interval. (i.e., the first interval of a minute will actually be seconds 0 through 9; the second interval of a minute will be seconds 10-19, etc…)

Cross out each second during which the parent is giving Directives, Praise, or making Interaction statements/questions. Use a diagonal line to cross out the numbers. If a parent is talking during the lapse from one second to another, cross out both seconds. If it is too

close to call, assume the coded verbalization carried over into the subsequent second and cross it out (same principle as close-to-call carry-overs described in the General Rules section at the end of coding manual).

Directives and Praises that carryover from one interval to another should be reflected in the duration count, with the 9 crossed out in the initial interval and the 0 crossed out in the next interval.

***Physical Prompts***

- Physical contact during a reprimand situation is coded as a physical prompt.
- A reprimand situation occurs when a child leaves the area, engages in a behavior that the parent has forbidden, or ignores the parent's directives.

Examples of **physical prompts**:

1. Pulling a child way from the baby gate to keep them from leaving the area.
2. Carrying or guiding the child back into the area.
3. Spanking.
4. Putting a child's shoe back on after having told the child not to take it off.
5. Taking a set of keys away from the child after telling the child not to touch. *[Note: parent does not have to actually touch the child when taking away an object in a reprimand situation]*
6. Taking a child out of a chair he/she had been told not to sit in.

## CODING PHYSICAL PROMPTS

Carryovers: If a directive begins in one interval and carries over into the next interval, circle D in the first box and draw a line connecting the D in the first box to the D in the second box.

Multiple prompts: Sometimes more than one physical prompt occurs in an interval. Under the following circumstances they are to be coded separately:

1. More than 2 seconds occur between the end of the first physical prompt and the start of the repeated prompt. [e.g., "No, no, Mommy said to come over here (guiding child away from gate)…2.5 seconds…no, no, come here" (guiding again) would be coded as 2 physical prompts].
2. The physical prompts are given for different behaviors [e.g., "Don't take Mommy's keys" (Mom pries keys out of hand) …child climbs on chair 1 second later…"No, don't climb on the chair" (Mom lifts child off chair)].
3. Another conversational element (directive, interaction) occurs between the two prompts (e.g., Mom trying to pry toy from child, letting go and stating, "it's time to clean," trying again to pry toy out of child's hand would be coded as physical prompt, directive, physical prompt).

**Up to three physical prompts can be coded per interval. Do not code a 4th physical prompt, even if it carries over.**
Prompt #1: Circle the PP
Prompt #2: Make a slash (/) through the PP
Prompt #3: Make a slash (\) through the PP

***Positive Touch***

- **Positive touch** includes affectionate gestures (e.g., patting child's head, holding child's hand, having child sit in mom's lap), which are **initiated by the parent**. Examples:
  1. placing hand on child's shoulder, arm, leg, or back (not in a restrictive manner)
  2. patting child on head, shoulder, arm, back, leg, or hand (not tapping to get attention)
  3. gently rubbing or brushing child on head, shoulder, arm, back, leg, or hand
  4. gently squeezing child's shoulder
  5. kissing or hugging child

- **Do not code PT** if the child initiates the touching behavior. If, after the child initiates contact (e.g., sitting in the parent's lap), the parent reciprocates with some kind of touching behavior that meets the criteria for positive touch, code PT at that time.
  - **For example:** child initiates lap-sitting (i.e., moves his/her body into position to sit in parent's lap) and parent touches child as he/she gets into the lap (e.g., parent assists child in some way into the lap-sitting position)—lap-sitting <u>is not</u> coded as PT, but the touching that occurred in the process of the child getting into position <u>is</u> coded as PT

<u>Carryovers:</u> If a positive touch begins in one interval and carries over into the next interval, circle PT in the first box and draw a line connecting the PT in the first box to the PT in the second box.

<u>Multiple positive touches</u>: Sometimes there are multiple positive touches in the same interval. Under the following circumstances they are to be coded separately:

1. More than 2 seconds occur between the offset of the first positive touch and the onset of the next positive touch.
2. Another coded behavior (directive, praise) occurs between the two positive touches.
3. If the positive touches are in response to two different behaviors, they are scored separately even if two seconds does not separate them.

**Up to three positive touches can be coded per interval. Do not code a 4th positive touch, even if it carries over.**
Positive Touch #1: Circle the PT
Positive Touch #2: Make a slash (/) through the PT
Positive Touch #3: Make a slash (\) through the PT

***Neutral Touch***

- **Neutral touch** includes any touch **initiated by the parent** that does not fit into either the Positive touch or Physical Prompt categories.
  - Examples:
    1. tapping child's shoulder to gain his/her attention
    2. pointing with physical contact to a body part or piece of clothing
    3. providing assistance with clothing, shoes, or hair
       - Tying child's shoe(s)
       - Brushing or fixing child's hair
       - Wiping child's mouth or face
       - Holding child's hand, arm, etc…while checking for injury

- **Do not code NT** if the child initiates the touching behavior (e.g., child taps parent on the shoulder)

Carryovers: If a neutral touch begins in one interval and carries over into the next interval, circle NT in the first box and draw a line connecting the NT in the first box to the NT in the second box.

Multiple neutral touches: Sometimes there are multiple neutral touches in the same interval. Under the following circumstances they are to be coded separately:

1. More than 2 seconds occur between the offset of the first neutral touch and the onset of the next neutral touch.
2. Another coded behavior (directive, praise) occurs between the two neutral touches.
3. If the neutral touches are in response to two different behaviors, they are scored separately even if two seconds does not separate them.

**Up to three neutral touches can be coded per interval. Do not code a 4th neutral touch, even if it carries over.**
Neutral Touch #1: Circle the NT
Neutral Touch #2: Make a slash (/) through the NT
Neutral Touch #3: Make a slash (\) through the NT

APPENDIX B

Coding Manual—Child Code

***Leaving the Area***

- Leaving the area occurs when the child leaves the area marked off by the baby gate and tape.

- Leaving the area is coded:
  - When the child leaves the designated area (i.e., the area marked off by the gate and tape on the floor.)
  - The child must be 2/3 out of the area to be coded. Examples include: both legs, midway from chest up, or knees down being outside the area.
  - If the child is out of view at the beginning of phase, code LA until he/she is back on camera.

**Coding Leaving the Area**

1. A child wanders out of the area and is not playing appropriately.
2. Continue coding LA until the child returns to the designated area.
3. If the child wanders off screen with a toy that he/she is picking up, do not code PA.
4. LA can be coded during all phases.

**Do not Code LA:**

1. If the child wanders off screen to pick up a toy that you saw leave the area and the child is off screen for less than 5 seconds.
2. If a portion of their body is out of view, but you can tell they are picking up or sorting (unless they are 2/3 out of view).
3. If the child put all the toys in the bins and then wandered off camera.

**Carryovers**:
Carryovers are noted by drawing a line from the circled LA in one interval to the LA in the next. You need only circle the symbol in the first interval for a carryover behavior.

**Multiple Instances of LA**:

- Multiple instances may be coded if there is a two second separation between the time the child re-enters the area, and leaves the area again

- **Up to three instances of leaving the area can be coded per interval. Do not code a $4^{th}$ LA.**

Leave area #1: Circle the LA
Leave area #2: Make a slash (/) through the LA
Leave area #3: Make a slash (\) through the LA

***Appropriate Play***

- This is when the child is playing appropriately during free play or other phases. Appropriate play is defined as when the child is playing with the toys in an appropriate manner. The child must actually be touching a toy to be scored AP.

**Coding Appropriate Play:**
- Child is holding a toy while standing, sitting, lying down, or walking.
- Putting a toy in her/her mouth.
- Playing with toys with his/her feet
- Doing some action with or in the process of doing an action with a toy.

Examples:
1. Lining up toys or moving them around
2. Coloring, drawing, building with blocks
3. "Acting out" scenarios vocally or sub-vocally with figurines
4. Looking at books or doing puzzles
5. Putting toys away in their containers when done

Blocked View
- Must be able to hear the child playing with the toy and/or see some sort of movement in the child's back, shoulder, or arm to code AP.

**Do not Code Appropriate Play:**
1. When the child is out of the area
2. When the child is yelling at the mom or throwing a fit (NA)
3. Sitting by the toys but is not playing with them.
4. Walking over the toys on the way to another activity.
5. Simply making noise (without toy contact).
6. Throwing or kicking toys in anger (NA).
7. Pushing or brushing toys across the floor in anger (NA).
8. Is handed a toy by the mother but pushes it away without handling the toy.
9. Sitting in or playing with the chair, or other non-toys (e.g., the blinds) while NOT holding a toy.
10. Carrying a toy when engaging in LA (e.g., AP is not scored until the child returns to the play after LA).
11. Looking at a book without touching.
12. Tantrumming, whining or any NA **while** playing with the toys. ***NA always overrides AP. They cannot be coded simultaneously (e.g., if they overlap).***
13. NOTE - if AP and NA occur in the same interval ***at separate times*** (i.e., for at least **part** of the interval they don't overlap), you CAN code both for that interval.
14. When child is soliciting parent's attention. ***SA always overrides AP***.

***Coding AP** – AP is coded only once per interval.

***Solicitations for Attention***

- Verbal **solicitations** for attention (SA) are coded when the child makes spoken attempts to gain mother's attention.
- Nonverbal solicitations for mother's attention are coded when the child makes a non-verbal attempt to gain mother's attention (e.g., tapping on shoulder, etc.).

**Code Solicitation for Attention when child is:**

1. **Asking** the parent questions. If the child is **answering** a question, code nothing (unless it's whiny or defiance, then code NA).
2. Telling parent to do something. ("You sort the blocks" or "I want you to help").
3. Making a request for something ("I want a cookie" or "I want to go in the other room.")
4. Calling her name. "Mommy, Mommy."
5. Drawing her attention to what he/she has done ("Mommy I sorted them all").

**Examples of SA:**

1. "Mama, help me"
2. "look"
3. "There"
4. "Here"
5. "See"
6. "Can I have one," "Can I play with that,"
7. "Mama, what's that?" (pointing to something)
8. "Mama, I'm done,"
9. "Look, Mom, I'm doing it,"
10. "Mommy, can I draw?"

**Nonverbal solicitations include:**

1. The child crawling into the mother's lap, or trying to crawl into her chair (**coded when it first occurs, not for the duration** of time the child is sitting on parent's lap).
2. Child leaning against mother while the mother is filling out forms
3. Child patting mother's arm, hand or leg, kissing the mom, hugging the mom, or other affectionate gestures.
4. Grabbing mother's clipboard or pen.
5. Child throwing toys toward the mother. (Also code NA).
6. Child engages in "pick me up" behavior (reaches arms out and whines and says "up."
7. Child points to a toy, makes a sound, and looks at the mother. If child does not look in the mother's direction, but just points and names an object, do not code SA.
8. Crying at the mother (i.e. in her face). For example child put his/her face directly in front of the mother's and cries. (NA is also coded)
9. Child touching the mother with an object (e.g., driving car on her leg).

**Do Not Code SA:**

1. When the mother initiates contact. For example, when the mother places the child in her lap.
2. DO NOT code SA if what the child is saying falls into any other category.
3. If the child is talking to him or herself. For example, child is talking about what he is building but not drawing mother's attention to the object.
4. If the mother and child are mutually engaging in conversation.

**Carryovers**:

Carryovers are noted by drawing a line from the circled SA in one interval to the SA in the next. You need only circle the symbol in the first interval for a carryover behavior.

**Multiple Instances of SA**:

- Multiple instances may be coded if there is a two second separation between each solicitation.

**Up to three instances of leaving the area can be coded per interval. Do not code a 4th SA.**

Leave area #1: Circle the SA
Leave area #2: Make a slash (/) through the SA
Leave area #3: Make a slash (\) through the SA

- Stop coding SA when the mother responds to the child's SA and picks up the child or when the mother talks to the child and the child ceases to display the SA behavior. If the child initiates a new SA or continues the same SA even after the mother responds, continue coding SA.
- SA and NA can be coded together (and often are). One does not override the other. For example, the child says, "Mommy, I want to go in the other room," in a whiny voice.

***Negative Affect***

- Includes all behaviors, verbal and nonverbal, that are unpleasant or aversive. NA can occur in the context of misbehavior, play, or interaction with the mother, or it can just be happening on its own.
  - Examples include:
    - Whining
    - Crying
    - Sobbing
    - Tantruming
    - Screaming
    - Grunting
    - Yelling
    - Making negative comments (e.g., "I'm mad at you!")

- Also includes all physical activities that appear intended to inflict pain or damage
  - Examples:
    - Hitting
    - Kicking
    - Biting
    - Throwing objects
    - Slapping

- **<u>NA behaviors can be coded during all phases</u>**

<u>Whining</u>

Some children become whiny and distressed. It is a good idea to listen to a portion of the tape before coding NA (whiny) to get a good feel for variations in the child's affective style (so you'll know when the child is whiny and when s/he is not). *Whining is usually clear if the child is upset or angry,* and it should be coded as NA. Whining when the child is frustrated (e.g., trying to fit in a puzzle piece) is also NA.

**Examples of NA:**

1. "Mommy, I want to play with the toys!" (In a nasal voice, more highly pitched than usual; has a siren-like quality)
2. "You stop it mommy:"
3. (Whines, grunts) "Uh, I can't do it..."
4. "Stop that Mommy," The child tells the mother to stop filling out questionnaires. This is a negative command.
5. "I can't," in a whiny voice, in the context of frustration.
6. "I want a cookie," in a whiny voice.
7. "I want to go in the other room" in a whiny voice.
8. "I don't wanna" in a whiny voice.
9. "No, no, no." Outbursts while playing with the toys.

<u>Saying "NO"</u>

Code NA for all verbal defiance – when child says "no" in response to a command, directive, or direct request from the mother. It is important to be able to distinguish the mother's conversational questions from commands, as many mothers state their commands in the form of a question. For example, "Why don't you play with the rings?" followed by a "no" would be coded NA (defiance). However, if the parent simply offers a suggestion or asks a question, such as "How about blue?" "Blue would look good." or "Do you want me to help?" do not code NA unless the child's "no" response is accompanied by a negative tone of voice and/or nonverbal indication of negativity (e.g., scowl). Often the mother's tone of voice will help distinguish a command from a conversation, and you will be able to determine whether to code "no" as NA.

**Do not code NA when the child is:**

1. Pushing the mother away without discernible force and unaccompanied by yelling, whining, or other NA behaviors.
2. Pulling away from mother. Or Squirming to get out of the mother's lap.
3. Tossing, throwing toys, or other objects without discernible force, in other words, tossing playfully. Any throwing at the mother or with force is NA.
4. Talking loudly. This is distinguished from screaming by the absence of a shrill quality.
5. Pulling at the mother's clipboard.
6. "No." as in "There are not blocks here, mommy." (answering her question, not defiant or whiny)
7. Banging two or more toys or other objects together. This is virtually always appropriate play (the child is allowed to make noise while playing).

**Child NA is coded only once per interval.**

NONE OF THE ABOVE

- Includes any behavior that does not meet criteria for LA, AP, SA, or NA.
- For example:
  - Walking/running around the playroom aimlessly, not playing with toys
  - Looking out the window, not involved with toys
  - Sitting quietly not playing with toys
  - Playing with the baby gate or other non-toy objects (e.g., clothing, hair, body parts, curtain)
  - Sleeping
  - Child sitting in, playing with or moving the small chair
  - Singing to her/himself
  - Blowing his/her nose
  - Climbing on things.
  - Any cessation of toy play for 10-sec that does not involve any other the other coded behaviors (coded in the interval during which there was no playing)
  - You cannot understand what the child is saying (e.g., child is babbling) or you can't see the child. Off-camera behavior can be coded (LA which began before the child went off the camera, also verbal SA, and verbal NA). Nonverbal NA or SA are not coded when the child is off-camera (e.g., the mother tells the child to stop kicking the cabinet, you can hear noise, but you can't see the child actually kicking the cabinet so you can't tell if the child is angry or upset).

APPENDIX C

Effect Size Calculations

Cohen's *d* for dependent *t*-tests:

The following formula is found on pp. 48-49 of Cohen's book entitled, "Statistical Power Analysis for the Behavioral Sciences." The formula is listed as "Case 4: One Sample of n Differences between Paired Observations."

1. $m_x - m_y = m_{(x-y)} = m_z$

2. $d_z' = m_z \div \sigma_z$ ($\sigma$ = standard deviation or "sigma")

3. $\sigma_z = \sigma_{x-y} =$ SQUARE ROOT OF $[\sigma_x^2 + \sigma_y^2 - 2r\sigma_x \sigma_y]$

The following calculations were conducted based on the above formulas (specific values were obtained from the SPSS printout of the *t*-test analysis):

*Solicitation for Attention*

1. $m_z = 29.9425 - 25.0389 = 4.9036$

2. $d = 4.9036 \div \sigma_z$

3. $\sigma_z =$ SQUARE ROOT OF $[18.56644^2 + 17.38631^2 - 2\ (.282)\ (18.56644)\ (17.38631)]$

   SQUARE ROOT OF $[344.71269 + 302.28377 - 2\ (.282)\ (18.56644)\ (17.38631)]$

   SQUARE ROOT OF $[646.99646 - 182.06025]$

   SQUARE ROOT OF $[464.93621]$

   $\sigma_z = 21.562379$

4. $d = 4.9036 \div 21.562379$

   $d = .2274146$

*Appropriate Play*

1. $m_z = 83.8506 - 82.9011 = .9495$

2. $d = .9495 \div \sigma_z$

3. $\sigma_z = \text{SQUARE ROOT OF } [19.58553^2 + 14.42779^2 - 2\ (.133)\ (19.58553)\ (14.42779)]$

   $\text{SQUARE ROOT OF } [383.59298 + 208.16112 - 2\ (.133)\ (19.58553)\ (14.42779)$

   $\text{SQUARE ROOT OF } [591.7541 - 75.765191]$

   $\text{SQUARE ROOT OF } [516.58891]$

   $\sigma_z = 22.728592$

4. $d = .9495 \div 22.728592$

   $d = 0.0417755$

*Negative Affect*

1. $m_z = 9.7114 - 8.5972 = 1.1142$

2. $d = 1.1142 \div \sigma_z$

3. $\sigma_z = \text{SQUARE ROOT OF } [13.44775^2 + 12.67083^2 - 2\ (-.048)\ (13.44775)\ (12.67083)]$

   $\text{SQUARE ROOT OF } [180.84198 + 160.54993 - 2\ (-.048)\ (13.44775)\ (12.67083)]$

   $\text{SQUARE ROOT OF } [341.39191 - (-16.357838)]$

   $\text{SQUARE ROOT OF } [357.74974]$

   $\sigma_z = 18.914273$

4. $d = 1.1142 \div 18.914273$

   $d = .0589078$

APPENDIX D

## Oklahoma State University Institutional Review Board

| | |
|---|---|
| Date: | Tuesday, April 19, 2005 |
| IRB Application No | AS0576 |
| Proposal Title: | Encouraging Independent Play: Verbal Versus Nonverbal Reinforcement |
| Reviewed and Processed as: | Expedited (Spec Pop) |

**Status Recommended by Reviewer(s): Approved** **Protocol Expires: 4/18/2006**

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215 N Murray
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The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☑ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 415 Whitehurst (phone: 405-744-5700, emct@okstate.edu).

Sincerely,

Sue C. Jacobs, Chair
Institutional Review Board

VITA

Raegan B. Smith

Candidate for the Degree of

Doctor of Philosophy

Thesis: ENCOURAGING INDEPENDENT PLAY: VERBAL VERSUS NONVERBAL REINFORCEMENT

Major Field: Psychology

Biographical:

Personal Data: Born in Memphis, Tennessee on November 9, 1975, the daughter of Roger and Donna Burlingame. Married on December 30, 2000 to Ryan Matthew Smith.

Education: Graduated from Edmond Memorial High School, Edmond, Oklahoma, in May 1994; received Bachelor of Arts degree in Psychology from the University of Oklahoma, Norman, Oklahoma in May 1998. Completed requirements for the Master of Science degree in Psychology at Oklahoma State University in December, 2000.

Experience: Completed pre-doctoral internship experience from September 2003 to August 2004 at the Oregon Health & Science University, Child Development Rehabilitation Center, Portland, Oregon; Graduate teaching positions include Abnormal Psychology in spring 2005 and Introductory Psychology fall 1999 and spring 2000; Currently employed as a psychological technician.

Professional Memberships: American Psychological Association, Southwestern Psychological Association

Name: Raegan B. Smith Date of Degree: May, 2006

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: ENCOURAGING INDEPENDENT PLAY: VERBAL VERSUS NONVERBAL REINFORCEMENT

Pages in Study: 115 Candidate for the Degree of Doctor of Philosophy

Major Field: Psychology

Two types of positive reinforcement were compared to examine their effectiveness in encouraging independent play in young children. A within-subjects design was used with mothers and their 30- to 42-month-old children. Experimental conditions varied according to type of positive feedback parents were instructed to give, such that praise and nonverbal affection strategies were used in alternate conditions and counterbalanced for order of presentation. Paired samples mean comparisons indicated no difference in children's behaviors across study conditions. However, differences were found between the first and second halves within each condition. Lower rates of independent play were found in the latter halves of both conditions. In the nonverbal condition, higher amounts of solicitation for attention and negative affect were found in the second half of the condition. In addition, correlation analyses suggested relations between child behavior and adjustment problems and observed behavior under various conditions of the study.

ADVISER'S APPROVAL: Maureen A. Sullivan, Ph.D.