

All for one and one for all:

A study of peer influence on consistency in preschoolers' play behaviour.

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## ABSTRACT

All for one and one for all: A study of peer influence on consistency in preschoolers' play behavior

Jacob N. Nuselovici

Although play behavior has typically been seen as a characteristic of the child *per se* it is also a social behavior in the sense that it happens in a group context. The present study was designed to assess the relative contributions of the individual and of social partners to play. Ninety-nine preschoolers participated in one-hour play sessions, involving three unfamiliar same-age, same-sex children. Play was observed in two ten-minute free-play periods, one at the beginning of the session and the other at the end. Positive and negative child-directed behaviors from peers were observed in structured group activities between the free-play periods. Bivariate regression and hierarchical multiple regression analyses showed that (a) individual children's reticence during free-play was not associated with peers' reticence, and (b) that children's and peers' group play behaviors were positively associated. Controlling for peers' play behaviors with nested analyses did not attenuate the consistency of play from the first to second free-play period. However, peers' behaviors were observed to moderate the consistency of both reticence and group play from the first free-play session to the second, depending on children's age and gender. Reticence was exhibited more consistently by younger boys who received fewer positive peer behaviors, while group play was more consistent for older children who received fewer negative peer behaviors. This study confirms prior findings indicating that individual measures of temperament (reticence) and social

competence (group play) from observations of peer interactions, while also showing how peers' behaviors construct a social context which affects children's play.

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## *Introduction*

Play serves an integral role in children's development (Garvey, 1977). Aside from its capacity to serve as an index internal functioning, play has been seen as critical for both cognitive and social development (Rubin, 1983). For this reason play has been used as a window to understand the origins of both normal and atypical development (e.g. Scarlett, Naudeau, Salonijs-Pasternak, Ponte, 2005). Studying play is challenging for several reasons. Indeed, the ecological validity of studies of play has been questioned due to the complexity of play itself and to the intricate social context in which it occurs. Although play is recognized as a social phenomenon, it has been typically studied at the level of the individual and the effects of a play partner on an individual's behavior has largely been ignored (Cairns, 1988). Most developmental researchers have regarded a child's play as an index of something about the child rather than seeing it as embedded within, and contingent upon the social behaviors of others. As a result, the relative contributions of the individual and the social partners to play remains undetermined.

This investigation was designed to accomplish two goals. First, the extent to which peers behaviors influenced children's play was examined. Second, the ecological validity of temperament and social development research that utilizes unfamiliar peer play paradigms was evaluated. In order to do so, triads of same age, same sex peers were invited to participate in an hour long play session in a laboratory setting, involving two 10 minute free-play periods separated by a series of structured activities. We expected that how participants' play behaviors changed across the two free-play periods would be influenced by how their peers interacted with them.

## CHILDREN'S PLAY

### *Theoretical Frameworks for Understanding Play*

The importance of play cannot be understated. It is a subject that has held a prominent place in different branches of psychology. In the psychodynamic field, play is viewed as a tool to overcome children's feelings of helplessness and feelings of relative smallness. As such, play is seen as a tool to overcome feelings that can impede successful development. For example, according to Erikson (1950), Sigmund Freud interpreted children playing games in which they hid objects and retrieved them as indications of learning to cope with the helplessness felt when the children were separated from their mothers. By controlling where and when the objects are hidden and retrieved in play, children are able to control a situation that they are unable to control in the real world.

Cognitive developmentalists have viewed play as developing in stages that represent changes in cognitive structures. Piaget viewed play, or more specifically changes in play, as progressing through three stages of cognitive development (Scarlett, et al, , 2005). In the first stage, *nonsymbolic practice games*, infants and young toddlers progress through their sensorimotor stage of development and engage in play that is representative of their concrete view of the world around them. The games they play are centered on the physical aspect of play, such as throwing or banging toys together or hiding and retrieving games. The second stage of play development, *symbolic play* is in early childhood. Children engage in play characterized by pretense or make believe games. Finally, in Piaget's third stage of play, *games with rules*, 6 to 12 year old children

engage in play dominated by rules. This shift is supported by children's developing ability to be able to see and understand different perspectives.

Another cognitive theory of play proposed by Vygotsky (1933) was specifically oriented to preschool aged children. For Vygotsky, preschool aged children were conflicted. On the one hand, he saw children with grandiose urges and wishes (e.g. drive a car, be a police officer), but on the other, these urges were highly unlikely to be satisfied. He noted that the emergence of play seemed to coincide with the emergence of these unrealistic urges. Through play, children are able to satisfy these urges and thus to children, play is something real, something that represents the world in which they live. These theoretical perspectives all converge on the fact that play is not just frivolous. Play is indicative of psychological phenomena or processes that are essential for young children's development.

#### *Types of Play*

Through meticulous observations of preschool-aged children playing together, Parten (1932) categorized the development of young children's social play into six levels, representing a hierarchy of children's social development. The first stage depicts children who are *unoccupied* in the face of playing peers. These are children who refrain or shy away from engaging in play with their peers. Next, children who engage in *solitary play*, focus on their own activities and using materials that are different than that of their peers. The third level has children displaying *onlooking* behaviors during free-play periods. Children watch others play without themselves participating in the play activities. On the next rung of Parten's social play hierarchy, *parallel play*, children play side by side with similar toys although not playing together. The fifth level, *associative play*, has children

engaged in the same types of play as the children around them. This level encompasses some interaction between the children, although interactions are not cooperative in nature. In the final level, children are engaged in *cooperative play*, joining together in rich cooperative interactions that drive their play to some common purpose or shared goal.

Parten's hierarchy of social behaviors was revised by Rubin (1982). Much like Parten's social play hierarchy, Rubin's (1982) Play Observation Scale indexed children's social maturation. Rubin collapsed Parten's onlooking and unoccupied behaviors into one play category, named *onlooking-unoccupied*. Rubin among others have found that children who demonstrate this type of behavior in the presence of peers, often show a range of internalizing problems (Rubin, Burgess & Hastings, 2002), such as social anxiety. Solitary play was divided into two kinds. Children displaying *solitary-passive behaviors* explore the objects or settings in their surrounding environment while playing alone, or engage in some sort of constructive behaviors on their own, such as building a tower or solving a puzzle. Children displaying *solitary-active behaviors*, engage in functional behavior (i.e. repeatedly banging toys together) or dramatic behaviors (i.e. engaging in solitary fantasy play) on their own. Rubin's fourth type of play, *parallel play*, was identical to Parten's fourth level. Finally, *group play*, combined associative and cooperative play to form a category encouraging all direct interactions between children in which some form of physical, verbal or symbolic exchange occurs.

Although children play throughout childhood, the types of play that children engage in changes. For Piaget, children's play develops in line with cognitive development. As their cognitive development matures throughout their childhood, so to

does the structure of their play. For example, Rubin, Watson and Jambor (1978) compared preschool versus kindergarten children and found that younger children were significantly more likely to exhibit play that involved a physical repetition of muscle movements either with or without a toy than their older counterparts. Kindergarten children were more likely to engage in games in which building or imaginary play was involved. Further, Parten found that even with preschoolers, play follows a developmental trajectory, such that young preschoolers displayed more immature or solitary play behaviors, while older preschoolers were likely to engage in more mature forms of social play (as cited in Rubin, Maioni, & Hornung, 1976). Additionally, although younger preschoolers displayed less group play behaviors with peers than did older preschoolers, preschoolers, in general, exhibited less group play with peers they did not know well, compared to peers they had spent more time with (Doyle, Connolly, & Rivest, 1980; Rubin & Rose-Krasnor, 1980). Thus, it is clear that both developmental level and social context contribute to children's engagement in various forms of play behaviors.

### *The Importance of Child's Play*

Children's play interactions within playgroups have provided researchers with a window into aspects of children's development that expand past immediate social context, such as the identification of risk factors for development problems. Research within this field has predominantly been focused around children's adjustment, or comfort level, within that context. One social context can elicit different reactions from different children. Some children, for the most part dubbed socially competent, can feel at ease with a social context. Although social competence has been challenging to define

(Rubin, Bukowski, & Parker, 1998), Rubin and Rose Krasnor's (1992) definition of social competence as "*the ability to achieve personal goals in social interactions while simultaneously maintaining positive relationships with others over time and across situations*" has been widely accepted (Rubin, Bukowski, & Parker, 1998, pp. 645). The abilities of socially competent children are thought to be a collection of emotional, cognitive and social skills that are age appropriate (Howes, 1987). For example, Howes (1987) presented a model of social interaction skills that distinguished the four stages of social skills needed for children, from infancy to preschool aged children, to establish and maintain friendship. For preschooler friendship formation and maintenance requires children to first have a social knowledge of the peer group, such as how a peer group functions. In order to establish friendships, children need to have the ability to differentiate potential friends from the rest of the playmates. Finally, they need to have the cognitive capacity enabling the child to see from a peer's point of view. Children who are deemed socially competent use more positive conflict resolution skills (Rubin, Burgess, & Coplan, 2002), are more accepted by their peers (e.g. Denham et al., 1990) and in turn are better able to maintain positive relationships with their peers and teachers (Lafreniere & Sroufe, 1985).

Sociometric studies, in which peers indicate the extent to which they like and dislike the members of their peer group (e.g., their school classroom or group) also point toward the importance of peer acceptance and rejection. Early studies revealed that children with difficulties in the peer group are over-represented in clinical populations (Cowen et al., 1973). Peer rejection is predicts the development of both internal and external problems in children (DeRosiers et al., 1994; Hymel et al., 1990). Children who



are accepted by peers are more likely to be helpful, to actively interact with their peers (Rubin, Bukowski and Parker, 1998), and tend to give and receive more positive reinforcement from their peers (Gottman, Gonso & Rasmussen, 1975).

While some children seem comfortable in social situations, others tend to show anxiety when interacting with peers. According to Rubin, Burgess, Kennedy and Stewart (2003) social withdrawal refers to “the consistent (across situations and over time) display of all forms of solitary behavior when encountering familiar and/or unfamiliar peers”. These behaviors are assumed to derive from a complex approach-avoidance conflict within these children in which the desire to play with the other children in their peer group is overwhelmed by their anxiety or by an absence of coping strategies. Such a behavioral profile has been shown to be a risk factor for the development of a number of negative developmental outcomes (see Rubin, et al., 2003 for a comprehensive review). For instance, Rubin, Hymel, and Mills (1989) found that social withdrawal at the age of seven predicted depressive feelings four years later. Another study tracking long term developmental outcomes of children’s shyness found that shyness in boys predicted a number of developmental outcomes thirty years later, such as delays in marriage, parenthood and careers stability (Caspi, Elder, & Bem, 1988).

Many researchers who study social withdrawal argue that this behavior stems from a behaviorally inhibited temperament (i.e., a biological predisposition), to react to situation in a fearful manner (Rubin, 1993). Behaviorally inhibited toddlers have a tendency to be anxious and fearful in their everyday interactions. Children’s anxiety and social withdrawal in the toddler years tend to develop into wariness and cautiousness

when these children encounter an unfamiliar situation or peers (Rubin, et al., 2003; Calkins, Fox, & Marshall, 1996; Kagan et al., 1988).

Longitudinal research has demonstrated the stability of social inhibition. Kagan, Reznick and Snidman (1988) showed that extremely inhibited toddlers showed similar levels of inhibition five years later. More recently, Rubin, Burgess, and Hastings (2002) investigated the effects of classical inhibition (i.e. unfamiliar context, unfamiliar adults) and social inhibition (e.g. with peers) across developmental periods. They found that children who displayed both classical and social inhibition in toddlerhood also tended to display socially reticent behavior at four years of age. One possible explanation for such stability, beyond biological predispositions, might lie within classroom walls. For example, Rubin (1982) hypothesized that solitary behaviors were encouraged by teachers as an indication of learning. The particular danger for consistently inhibited children is that they were shown to be more susceptible to developing internalizing problems later in life (Rubin, Burgess, Kennedy, Stewart, 2003).

Though research has established that shy children show some stability of behavior across time, the links across context are less clear. Research has shown that across different unfamiliar contexts, there seems to be an inconsistency of solitary behaviors. For example, Rubin, Hastings, Stewart, Henderson and Chen (1997) examined the consistency of social play behaviors across different unfamiliar scenarios. Children interacted in three types of unfamiliar situations: unfamiliar setting, unfamiliar adult and unfamiliar peers. Results indicated that only a small subset of the children, roughly 11%, were consistently inhibited across all three unfamiliar situations. Of the extremely inhibited children, most children either showed high levels of classical inhibition (i.e.

unfamiliar context and unfamiliar adults) and mid-levels of social inhibition, or the opposite (i.e. high levels of social inhibition and mid or low levels of classic inhibition). Therefore, the context in which children find themselves might exert as much influence in determining social withdrawal behaviors as do children's individual tendencies.

### *The Social Context of Play*

As children develop, their play is increasingly experienced within the context of peers. The theories of play put forth by Piaget and Vygotsky acknowledge the social aspects of play. In fact, to a certain extent within Piaget's second stage and implicitly within Piaget's third stage, children's play development intersects with other children. Implicit in games with rules, for example, is the presence of other children. Although a child can make up rules when playing alone, making up and enforcing rules is most beneficial to group harmony play in play involving others. Cairns (1998) emphasized the need for developmental researchers to look at the full picture. He noted that when looking at children's behavior and trying to identify behavioral outcomes, one must take into consideration the totality of environmental influence. This point has been largely ignored when it comes to developmental research due to complexity of the relationships and their accompanying methodological issues.

A similar lapse is found in most of the literature looking at the developmental outcomes of social play behaviors. Although children's play is observed within a peer context, children's play behavior is typically measured independently of how the child's peers might be playing. This is the case for studies which draw inferences about the meaning of children's play behaviors from a single observation of peer interactions (e.g. Rubin et al., 1997), as well as those that aggregate children's observed play over repeated

observations (e.g. Coplan, Prakash, O'Neil, Armer, 2004). This research tacitly implies that a child's play behavior is independent of how their peers are playing. Within a peer group, however, the behaviors of the other children might modify how a child would typically act. For example, a child displaying solitary behaviors might be drawn into more socially competent play by a highly social child. The opposite might be true as well whereby a child who is reticent or who might be engaging in solitary play behaviors might be uncomfortable by the advances of a social child and retreat into more serious social withdrawal. Alternatively, children's displays of play behaviors while in the presence of different peer behaviors might have different meanings. Is a child who is reticent while in the company of peers, who are similarly reticent, truly displaying the same behavioral patterns as a child who is exhibiting reticence in the presence of non-reticent peers? Up until now, reticence research has treated both these children as the same. Yet, the question remains as to whether they are. Children who continue to display reticence while in the company of non-reticent peers might exhibit more pervasive or consistent social withdrawal than those who do so in the presence of reticent peers.

In order to provide a comprehensive view of social withdrawal, the play behaviors of peers within a play group must be accounted for. Most previous studies have not utilized the appropriate kinds of statistical procedures for this. Analyses of play behavior with ANOVA, correlations and hierarchical linear regression analyses have treated the individual child as independent of the social group. For example, Rubin et al. (1997) looked at the correlation between toddlers' inhibited behavior toward an unfamiliar adult with toys and toddlers' reticent behavior toward an unfamiliar peer, without considering how the peer's behavior might elicit the toddlers' reticence. Ignoring the nested nature of

social interactions and possibilities of peer influences on individuals' behaviors leaves such studies open to the critiques of compromised ecological validity and misinterpretation of the sources of individual differences. In order to avoid these critiques and interpret data more accurately, the nested design must be incorporated into analyses, such that influences of peers' play behaviors on individual children's behaviors are statistically accounted for.

Although the direct contribution of peers to individual behavior has for the most part been overlooked within play literature, evidence of peer influence is not unknown. Such evidence exists within other branches of psychology. In looking at the influence of peers on individual behavior, a great deal of work in social psychology has been devoted to showing the effects of conformity. For example, Asch's (1956) landmark study on conformity showed that many people dismiss the evidence of their own perceptions and conform to unfamiliar peers' actions. Similarly, Sherif (1961) investigated children's conformity to social groups. Through a series of competitive games for limited resources, two groups of boys grew increasingly hostile towards each other and aggressive behaviors ensued. Even children who had been friends prior to the start of the study succumbed to peer influences and behaved in concert with their group, showing that individual behaviors can be affected by group actions. More directly pertinent to the current investigation, Rubin, Daniels-Beirness, and Hayvren (1982) found that preschool aged children who were less liked by their peers also displayed less mature play behaviors (i.e. less social group play), received fewer initiations from their peers and experienced more negative peer interactions. These investigations point to the potential contributions that peers influences can have on individuals' behaviors.

As illustrated by Rubin, Bukowski, and Parker (1998), interactions are the product of an ongoing cycle of individual actions and reactions as played out within a surrounding environment. Magnusson (1998) attempted to incorporate both individual and environmental influences into his theory on interpersonal interactions. In his person-environment theory, the key to individual influence was *human agency*, or the motivations and social goals that guide a person's actions. Magnusson proposed two other factors contributing to interactions in combination with human agency: *situational factors* and *social factors*.

Magnusson's emphasis on *social factors*, refers to the effect that other individuals within a social environment can have on an individual's behavior. Each participant in an interaction comes to the exchange with their own personal goals, motivations, characteristics. As the social exchange progresses, their behaviors are modified by what the other is doing. Within the confines of an interaction, individuals are constantly interpreting and reevaluating their social partner. Behaviors that are taken out of their social context could provide an inaccurate understanding of the causes or meaning of those behaviors. For example, Harris and colleagues (1982) showed that manipulating children's expectations about an unfamiliar peer with whom they were about to play affected children's play during their interactions. Extending this to the current investigation, how a child behaves at the initial stages of an extended interaction period could affect how peers respond to them, and thereby affect the children's later play behaviors.

*Studies on Peer Influences of Behavior*

Although the direct influence of peers on individual behavior has been largely absent in play research, it has not been completely ignored. Two notable exceptions are worth mentioning. Perssons (2005) conducted a 3 year longitudinal study of the receipt of prosocial or aggressive behaviors from peers and its influence on free-play behaviors. Across the 3 year span, Persson's found that children, aged 22 to 44 months initially, who were more prosocial received significantly more prosocial responses from their peers and less victimization from peers. Interestingly, aggression did not beget more aggression. Perssons found that children who behaved in an aggressive manner received less aggression over time, and also fewer prosocial behaviors from their peers. Persson demonstrated how children's behaviors feed into how other children treat them, such that prosocial behaviors seem to be met with further socially positive behaviors, while negative behaviors seem to be met with an absence of social behaviors.

Gazelle and colleagues (2005) investigated the cross-contextual consistency of social wariness with familiar and unfamiliar peers in 4<sup>th</sup> grade girls. In order to do so, the researchers observed girls' behavior during lunch periods, obtained anxious solitude measures from teachers and used peer nominations to determine which girls exhibited anxious-solitary characteristics. Each girl was then placed in a familiar and unfamiliar peer group and observed for one hour of structured activities for 5 consecutive days in each group, and the researchers interviewed each participant. Following the first hour of play, both the familiar and unfamiliar peers similarly perceived the solitary girls as more socially anxious than other normative girls. Within the unfamiliar peer group, the solitary girls were less liked than the normative girls and displayed more socially awkward behaviors, engaged in fewer interactions with their playmates, expressed less interest in

their playmates, showed less positive emotions, and received more negative and fewer positive responses from their playmates. Further examination revealed that by the third day, both peer mistreatment and indices of anxious behaviors (e.g. perceived social withdrawal and observed socially awkward behaviors) decreased in the unfamiliar peer group, while remaining at a more elevated level in the familiar peer group. Thus, Gazelle and colleagues were able to show the existence of a transactional relationship between anxious solitary girls and their peer groups, such that socially anxious girls elicited negative reactions from their peers which fed back into their socially anxious behaviors.

Taken together these studies highlight the importance of accounting for a transactional relationship between children's behavior and their peers. Children do not behave in a vacuum, acting completely independently from their peers. Their behaviors elicit reactions from peers in their social network. Children might show some stability of behavior because of temperament, or biological predispositions, or socialization, but stability might also be a consequence of how peers create a contingent social context. Children elicit reactions, both positive and negative from their peers which feed into the stability of their behavior. Accounting for such an effect, would provide for consistency and complete understanding of children's play behavior.

#### *Play, Individual Characteristics, and Social Context*

Social exchanges begin with personal agency, which is driven by motivations and perceptions. Social behaviors also differ across gender. Whether such gender differences are driven by biological influences or by socialization, gender differences seem to be particularly important at the preschool stage of development. Gender segregation in play begins to emerge, and with that comes differences in play behaviors (Scarlett, Naudeau,



Salonius-Pasternak, & Ponte, 2005). For example, Lever (1978) observed boys' and girls' play behaviors and found that boys played more games that involved debatable rules while girls played in games that involved more turn taking and thus less conflict. Further, she found that boys were more likely to use aggression as a technique for solving conflict. In the rarer event of conflict among girls, avoidance was a more common strategy to end conflict. Further, Ausch (1994) explored gender differences in 5-6 year old children as they participated in cooperative play activity, in which dyads of boys and girls were asked to assemble a project together (a doll house for the girls and a command center for the boys). Ausch found that girls tended to use more indirect, cooperative, and conflict attenuating play strategies, while boys tended to use more direct, aggressive play strategies. Because avoidance might be more gender-typical behavior for girls, reticent or solitary boys might elicit more negative reactions from peers, or experience more negative social outcomes (Caspi, Elder, & Bem, 1988). Thus, gender differences in how peers' respond to and affect children's play might be expected in this investigation.

Similarly peers' influence on play might differ for younger versus older children preschoolers. As reviewed earlier, reticent or solitary play decreases over the preschool period, and also becomes increasingly indicative of social immaturity or problems. Therefore, older peers might be expected to react more negatively to children's social withdrawal, compared to younger peers.

### *Current Investigation*

Preschool-aged children live within rich dynamic social systems. Of particular significance during this developmental period is the emergence of peer groups as an important social environment for children. Children's play behaviors within a peer group

have allowed researchers a glimpse into aspects of their social development. Such behaviors have been linked to a number of developmental outcomes, such as onlooker-unoccupied play preceding the development of internalizing problems. The studies that have examined the relations between children's and peers' behaviors during play suggest that peers make important contributions to each other's behaviors. Past research has shown solitary children elicit fewer positive behaviors from peers (Gazelle et al., 2005), that interacting with unfamiliar peers increases children's engagement in less mature play behaviors (Doyle, Connolly, Rivest, 1980; Rubin, & Rose-Krasnor, 1980), and that receipt of positive initiations from peers is associated with engaging in more mature play behaviors (Rubin, Daniels-Beriness, & Hayvren, 1982). Less is known, however, about the effects that peers can have on the stability of children's displays of such behaviors over time.

In order to investigate the links between peers and children's play, groups of three previously unfamiliar preschool aged children, were invited to a laboratory to participate in an hour-long play session. First, children were allowed to play for ten minutes. Next they were guided through a series of structured activities by an examiner for thirty minutes. Finally the children were allowed to play for another 10-minute period. The influences of peers' behaviors during the free-play periods, and in the intervening structured activities, on children's free-play behaviors were examined.

The present investigation will attempt to shed some light on the effects of peers on an individual child's play behavior. A person-environment model was presented in which the consistency of play over discrete observations were examined in the context of

age differences, gender differences and different peer effects, such as play behaviors and the target child's receipt of positive social behaviors and negative social behaviors.

Consistency within the framework of this investigation will be determined as the positive association between play behaviors across time points. In a departure from past research in this field, consistency will be examined over a very brief period of time, a single observational session. Other studies with relatively short time-spans (Gazelle et al., 2005; Rubin & Rose-Krasnor, 1980) have focused on children's solitary or sociable behaviors over a few days. It is still unknown if peers can influence young children's play behavior over a one hour time span.

The play behaviors examined in this project included the two extremes of the Play Observation Scale: onlooker-unoccupied and social group play. By focusing on these two extremes, the analyses should provide insight into how peers affect different types of play behaviors. The influences of peers in structured activities, as well as within free-play sessions, were examined. Such structured activities can provide insights into the ways children interact and might effect how future interactions occur. For example, an activity requiring cooperation might lead children to exhibit positive behaviors such as sharing that could lead to an increase in group play in a subsequent free-play session, or such an activity might lead to negative behaviors, such as competitive behaviors, which could lead to decreases in subsequent social play. Also, how peers behave in some activities that ask for attention to be given to another child, such as show and tell, could provide indications of how considerate a child is. A peer who butts in and disrupts a child's turn might subsequently lead to increases in solitary play activities.

### *Hypotheses*

Children's engagement in reticent and group play behaviors was expected to contribute to the social context of the interactions.

- a) Individual children were expected to show stability in their levels of reticence and group play over a brief period.
- b) Within the free-play periods, children were expected to show similar levels of reticent and group play behaviors as their peers.
- c) Children who engaged in more reticent and less group play were expected to receive more negative and less positive peer influences in the subsequent tasks.

### *Consistency of Play Behaviors:*

The consistency of children's reticent behavior was expected to vary as a function of the extent to which the child received positive versus negative behaviors from peers.

- a) It was hypothesized that the receipt of fewer positive peer influences would increase the consistency of reticent behaviors.
- b) It was hypothesized that the receipt of more negative peer influences would contribute to the consistency of reticent behaviors.

The consistency of children's group play behavior was expected to vary as a function of the extent to which the child received positive versus negative behaviors from peers

- c) It was hypothesized that the receipt of more positive peer influence would increase the consistency of group play behaviors.
- d) It was hypothesized that the receipt of fewer negative peer influences would contribute to the consistency of group play behaviors.

Finally, age and gender were examined as possible moderators of the effects of peers' influences on the consistency of children's play. Tentative hypotheses were proposed. Peer influences were expected to have greater impact on older preschoolers' consistency of play. Boys' reticence was expected to elicit more negative and fewer positive responses from peers, which in turn would increase the consistency of boys' reticence across free play sessions.

## Method

### *Participants*

The sample consisted of 99 children (55 girls) between the ages of 2.08 and 4.92 years old, with a mean age of 3.47 and a standard deviation of .74. The sample predominantly spoke English as a first language (74.7%), followed by French as a first language (22.2 %). Three children spoke another language as a first language but were able to speak either French or English as a second language. Mothers' ages ranged from 23.67 to 50.50 ( $M = 35.89$ ,  $SD = 4.64$ ), while fathers ages ranged from 25.42 to 56.92 ( $M = 38.22$ ,  $SD = 5.53$ ). There were 74 Caucasian families, 11 Asian families, 7 with mixed ethnicity and 7 families with other ethnicities (Hispanic, Black, Middle Eastern or other). The majority of the families reported an income between 40 000 and 60 000 dollars (56,6%) ( $M = \$80229.17$ ,  $Mode = \$50000$ ,  $SD = \$47777.21$ ). There were 27 participants who were only children, 45 who had one sibling, 21 who had two siblings and 5 who had more than two siblings.

Participants were recruited through newspaper ads in both French and English and through posters calling for participants in daycares across Montreal. Parents who were

interested in participating were called back and provided with information regarding the study and had a screening interview administered. Children who were not fluent in either French or English, who were not attending preschool or daycare, or who suffered from any disabilities were excluded from the study. 133 families participated in the study. Only those children who completed the laboratory visit component of the study's protocol were included in the present sample.

### *Procedure*

Triads of three participants were brought to the laboratory for a one hour play session. The participants had never previously met each other and were of the same gender (16 male triads and 22 female), age, and spoke the same language. To be considered of the same age, children's birthdates were within six months of each other. The families' arrival times, at the university, were staggered and, upon arrival, each parent and child were taken to a different room in order to ensure that the children would not meet prior to the study beginning. Once all three families had arrived, each parent and child were escorted to a large playroom. The room was equipped with a variety of age appropriate toys. When the children entered the playroom, a woman examiner introduced herself to them. She remained in the playroom throughout the course of the study to administer the procedures. Parents left the playroom; those wanting to observe their children did so in an adjacent observation room. The lab visit was videotaped for later coding.

Approximately five minutes after entering the playroom, the examiner initiated a ten-minute free-play period for the children. No restrictions were set on which types of toys children were to play with or with whom they were to play. The ten-minute free-play

period was followed by structured activities, two of which were used to observe peers' positive and negative non-play behaviors. The first consisted of a cooperative puzzle activity. The puzzle activity consisted of a 24-piece puzzle that was evenly distributed between the three children. The children were explicitly told that they would need to work together to complete the puzzle. The children were given five minutes to complete the puzzle without the experimenter's help. At the end of the five minutes, the experimenter helped the participants complete the puzzle. The second activity was a show and tell type activity. Children were asked to deliver a short speech about their most recent birthday in front of the experimenter and the other peers in the triad. The experimenter was instructed to aid the participants by prompting the participants to continue with the story until the children said the story was finished. After the structured activities, there was another ten-minute free-play session that mirrored the first free-play session.

#### *Coding and Reliability*

The free-play sessions were coded by the undergraduate students. The present investigator and two undergraduate students (one for the puzzle activity and one for the speech activity) independently coded 21% of the videotaped activities (N=21). Reliability coefficients for codes used in the sample are reported in Table 1.

*Play Observation Scale (POS)* (See Appendix A). Dr. Robert Coplan, Carlton University, an expert in the Play Observation Scale (POS; Rubin, 1989) trained Dr. Hastings, and a graduate student Caroline Sullivan, in the POS. The free-play sessions were coded using the POS. The procedure involved coding ten-second intervals for social

Table 1

*Inter-Rater Reliability*

Variables	Kappa
Puzzle – Initiation Received	.91
Puzzle – Initiation Accepted	.87
Puzzle – Initiation Rejected	.82
Puzzle – Mutual Play	.99
Prosocial Received	1.00
Aggression Received	.82

Variables	Cronbach`s $\alpha$
Speech- Attentive	.99
Speech- Inattentive	.99
Speech- Disruptive	.98

Variables	Kappa
Play Observation Score	.77



participation (unoccupied, onlooking, solitary play, parallel play, conversation and group play), the cognitive quality of play (functional play, dramatic play, constructive play and exploration), and a count of teacher-child interaction. These features of behavior were used to assign children's predominant behavior was coded. Because the exact durations of free play periods varied slightly across triads, the resulting frequencies were then divided by the total number of codable segments observed, to obtain proportion scores for each category of play behavior. Several undergraduate students were trained by these two researchers in coding the POS from videotape. The training involved group workshops coding series of videotaped interaction of children. To be designated as reliable POS coders, undergraduate students had to attain a Kappa coefficient of .70 or greater across at least 288 consecutive time segments of observing play. To code the videotaped play interaction from the lab visits, three trained reliable coders examined each videotape so that each child on the tape had an independent observer.

*Group Activity Scale* (See Appendix B). The Group Activity Scale was developed for this study to capture the collaborative behaviors displayed by the children while participating in the group puzzle activity. This involved coding ten-second intervals for cooperation codes, including bids of initiation to cooperative play, acceptance of an initiation bid, rejecting of an initiation bid and mutual play, competitive behaviors (such as besting, self praise, or direct challenges), aggressive behaviors, and prosocial behaviors (praise or encouragement). An undergraduate student was trained in group activity coding. When multiple behaviors were observed in the same ten-second interval, the predominant behavior was coded. Because the exact durations of free play periods varied slightly across triads, the resulting frequencies were then divided by the total

number of codable segments observed, to obtain proportion scores for each category of play behavior. An undergraduate student was trained by the author in completing the group activity scale from videotape. To be designated as reliable coder, the undergraduate student and the author had to attain a Kappa coefficient of .70 or greater for each code.

*Speech Coding Scheme* (See Appendix C). The Speech Coding Scheme (Hastings, 2001) captured the totality of participants' behavior while engaged in the speech activity. Coding involved a ten-second samples in which the children's attention to the speaker was noted. A code of quietly attentive was given when the child was sitting quietly paying attention to the speaker (i.e. maintaining speaker in field of vision). A code of quietly inattentive was given when the peer in the audience was not paying attention to the speaker but was not trying to disrupt the speaker or disrupt the other peer listening to the speech. A peer attempting to disrupt the speech or to distract the other peer was assigned a code of disrupt/distract. If multiple behaviors were observed in the same ten-second interval, the predominant behavior was coded. Because the exact durations of free play periods varied slightly across triads, the resulting frequencies were then divided by the total number of codable segments observed, to obtain proportion scores for each category of play behavior. The author and an undergraduate student were trained by Dr. Hastings in completing the speech coding scale from videotape. To be designated as reliable coder, both the author and the undergraduate students had to attain a Cronbach alpha of .70 or greater.

## Results

### *Descriptive Statistics*

Refer to Table 2 for descriptive statistics. A Mixed Sex X Period ANOVAs was used to examine whether statistical differences between onlooker-unoccupied behaviors differed across free-play sessions and gender. Results revealed that children displayed less onlooker-unoccupied behaviors in the second free-play session than the first ( $F(1, 97) = 17.37, p < .001$ ), regardless of gender ( $F(1, 97) = .17, ns$ ). A second Mixed Sex X Period ANOVAs was used to examine whether statistical differences between group play behaviors differed across free-play sessions and gender. Results revealed that children displayed more group play behaviors in the second free-play session than the first ( $F(1, 97) = 12.05, p < .001$ ), and that boys tended to display more group play behaviors across the free-play sessions than girls ( $F(1, 97) = 2.84, p < 1.00$ ).

Eight codes from the group puzzle activity and the speech coding activity were used to compute both positive and negative peer influence scores. In order to compute positive peer influence scores, *initiation behavior* codes, *accept initiation*, *mutual play* and *prosocial* codes, were utilized from the group puzzle coding, along with *attentiveness* during speech activity. Factor analysis on the codes produced a one factor solution with an Eigenvalue of 2.247 which accounted for 56.18% of the variance. Item weights on the factor ranged from .60 to .85,  $M = .74$ . Proportionalized positive peer influence scores ranged from 0 to .32,  $M = .08$  and  $SD = .09$ .

The negative peer influence code was composed of *initiation rejected*, and *aggression received* codes from the puzzle activity and *disruptive attention* from the speech coding activity. A factor analysis revealed a 1 factor solution with an Eigenvalue

Table 2

*Descriptives*

	Variables	Minimum	Maximum	Mean	Standard Deviation
Free-play 1	Onlooker-Unoccupied	0	1.00	.22	.24
	Group Play	0	.89	.18	.27
Speech	Attentive	0	1.00	.71	.26
	Inattentive	0	.80	.18	.18
	Disruptive	0	.83	.09	.15
Puzzle	Initiation Received	0	.41	.07	.08
Activity	Initiation Accepted	0	.24	.03	.04
	Initiation Rejected	0	.45	.03	.07
	Mutual Play	0	.96	.23	.29
	Prosocial Received	0	.14	.02	.03
	Aggression Received	.0	.14	.09	.02
Free-play 2	Onlooker-Unoccupied	0	1.00	.12	.15
	Group Play	0	.87	.29	.31

of 1.30 accounting for 43.36%. Item weights on the factor ranged from .52 to .81,  $M = .65$ . Proportionalized negative peer influences ranged from 0 to .32,  $M = .04$  and  $SD = .05$ .

#### *Stability of Play Behaviors*

First-order correlations were utilized to determine the stability across the free-play sessions of onlooker-unoccupied behaviors and group play behaviors, were utilized (see Table 3). Results indicated that onlooker-unoccupied and group play were significantly and positively related, with a medium effect size ( $d = .49$  and  $d = .38$ , respectively), across play sessions.

#### *Peers' Play Behaviors*

First-order correlations were used to test the first set of hypotheses, regarding the relations between children's play behaviors and their peers' play behaviors (see Table 4) and positive and negative influences (see Table 3). Measures of peers' reticent and group play behaviors in each free-play session were calculated by averaging the two peers' onlooker-unoccupied and group play behaviors, respectively. Individual onlooker-unoccupied behavior during the first free-play session was not significantly correlated with peers' reticence, nor with negative peer influences in the following structured activities, but it was correlated with peers' positive influences. Children who showed more onlooker-unoccupied behavior received fewer positive peer influences during the puzzle and speech tasks. Group play was significantly and positively related to peers' group play during the two free-play sessions. As well, children who engaged in more group play in the first free-play period subsequently received both more positive and

Table 3

*Correlations between Free-play Behaviors and Peer Influences*

Variables	1	2	3	4	5	6
Free-play 1 1. Onlooker- Unoccupied	--	-.33**	-.23*	-.01	.30**	-.12
2. Group Play		--	.40***	.23*	-.13	.35***
3. Positive Peer Influences			--	.12	-.17+	.20*
4. Negative Peer Influences				--	.07	.08
Free-play 2 5. Onlooker- Unoccupied					--	-.27**
6. Group Play						--

NOTE: + &lt; .10, \* &lt; .05, \*\* &lt; .01, \*\*\* &lt; .001.

Table 4

*Correlations between Free-play Behaviors and Peers' Play Activities*

Variables		Onlooker- Unoccupied		Onlooker- Unoccupied	
		Target Child	Peers	Target Child	Peers
Onlooker- Unoccupied	Target Child		-.02	-.33**	-.07
	Peers			-.11	-.31*
Group Play	Target Child	-.02			.68***
	Peers	-.27**	-.08		
		-.05	-.26***	.65**	

NOTE: Above the diagonal: Free-play 1

Below the diagonal: Free-play 2

+ < .10, \* < .05, \*\* < .01, \*\*\* < .001.

more negative peer influences, although only positive peer influences predicted more group play in the final free-play period.

*Testing the contributions of peers' influences to the consistency of children's play*

To account for the associations between peers' play behaviors and children's play behaviors, hierarchical multiple regression analyses incorporating standardized residuals were used in this investigation. This technique involves running two sets of regression analyses and comparing their results. The first set of regression analyses would conform to the usual, individual-level treatment of the data, not accounting for peers' behaviors. The second set of regression analyses would require first eliminating any shared variance in children's and peers' play behaviors, and then using the children's independent data in subsequent analyses. That independent data could be generated by regressing children's observed play behavior onto peers' observed play behavior and saving the standardized residuals, thus obtaining a measure of children's play free of shared variance with peers' concurrent play. Finally, the two sets of analyses would be compared, and deviations in the results could be taken as indicative of the extent to which peers' behaviors contribute to the behaviors of individual children during play.

The first set of regression analyses involved predicting children's play behaviors in the second free-play session from their behaviors in the first free-play session, as well as from peers' positive and negative influences in the intervening activities. For the first set of regression analyses, the individual play behavior in each free-play session was regressed onto mean peers' behavior within the same session, and standardized residuals were saved, providing measures of individual play behavior in the first and second free-play sessions that were independent of peers' play behaviors in those sessions.



Regressions were then conducted predicting the standardized residual of play behavior in the second free-play session from the standardized residual of play behavior in the first free-play session, as well as peers' positive and negative influences.

*Did peers behavior across free-play sessions affect individual stability of onlooker-unoccupied play behaviors?*

*Overview.* The consistency of play behavior was examined as it relates to gender, age, and the effects of positive and negative peer interactions, by utilizing hierarchical multiple regression analyses. Due to a complex model and a limited sample size, interactions with gender and age were analyzed in separate analyses in order to maximize power. In all, two sets of analyses were initially conducted.

*Onlooker-Unoccupied.* The first set of analyses looked at the stability of onlooker-unoccupied behavior across free-play sessions and the contributions of gender, and peer influences without accounting for peers' behavior. In these analyses, onlooker-unoccupied during the second free-play session was entered as the dependent variable and age and gender were entered as covariates in the first step of the analysis. Results for this hierarchical multiple regression are presented in Table 5. Onlooker-unoccupied during free-play 1 accounted for a significant portion of the variance in onlooker-unoccupied behavior during the second free-play session, showing the stability of onlooker-unoccupied behaviors across free-play sessions. In addition, the fifth step, including gender by positive and negative peer influences interactions, approached significance. The specific coefficients revealed an interaction, gender by negative peer influences (see Figure 1), that approached significance. For girls, there was a significant and positive relation between negative peer influences and subsequent onlooker-

Table 5

*Hierarchical Multiple Regression Analyses for the stability of onlooker-unoccupied play behaviors, gender and peer influences.*

Variables	Not Controlling Peers FP				Controlling Peers FP			
	Behaviors				Behaviors			
	Onlooker- Unoccupied		Onlooker- Unoccupied		Onlooker- Unoccupied		Onlooker- Unoccupied	
	R <sup>2</sup>	Δ R <sup>2</sup>	β	p	R <sup>2</sup>	Δ R <sup>2</sup>	β	p
Step 1	.01	.01		ns	.01	.01		ns
Age			-.10	ns			-.09	ns
Sex			.06	ns			.05	ns
Step 2	.11	.09		.002	.10	.09		.002
FP1			.30	.002			.30	.002
Step 3	.12	.02		ns	.12	.02		ns
PI			-.10	ns			-.09	ns
NI			.01	ns			.10	ns
Step 4	.15	.03		ns	.15	.03		ns
FP1 X PI			-.14	ns			-.16	ns
FP1 X NI			-.11	ns			-.11	ns
Step 5	.21	.07		.06	.21	.06		.094
Sex X PI			.11	ns			.10	ns
Sex X NI			.19	.08			.18	.100
Sex X FP1			-.12	ns			-.11	ns

Step 6	.28	.07		.02	.27	.07		.024
Sex X PI X FP1			.27	.013			.29	.017
Sex X NI X FP1			.17	ns			.17	ns
Model Summary	Adj. R <sup>2</sup> = .18			Adj. R <sup>2</sup> = .18				
	F (12, 90) = 2.88, <i>p</i> < .01			F (12, 90) = 2.69, <i>p</i> < .01				

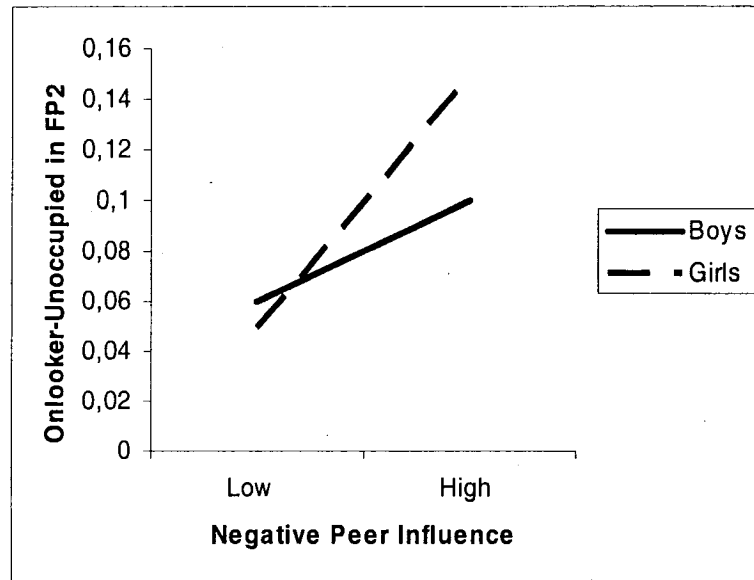
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NOTE: PI= Positive Peer Influence

NI= Negative Peer Influence

FP= Free-play

Figure 1: Negative Peer Interactions X Gender on Onlooker-Unoccupied Free-play 2.



unoccupied behavior ( $\beta = .31, p < .05$ ), while the relation was not significant for boys, who showed a positive but not significant relation ( $\beta = .13, ns$ ).

The final step, including 3 way interactions between gender, initial onlooker-unoccupied and positive and negative influences, was significant. The Gender X Free-play 1 Onlooker-Unoccupied X Positive Influence (PI) was significant. To examine this interaction, separate regression analyses were performed for boys and for girls. The Gender X Free-play 1 Onlooker-Unoccupied X Positive Influence (PI) interaction was significant for boys ( $\beta = -.45, p < .01$ ), but not for girls ( $\beta = .07, ns$ ). Following the recommendation of Aiken and West (1991), the relation between Free-Play 1 and Free-Play 2 was examined at low and high levels of Positive Influence. The consistency of onlooker-unoccupied was significant for boys who received fewer positive peer influences ( $\beta = .75, p < .001$ ) (see Figure 2). Boys who received more positive peer influence displayed a negative, although not significant, relation between onlooker-unoccupied across free-play sessions ( $\beta = -.58, ns$ ). Girls showed similar levels of stability whether they received fewer ( $\beta = .15, ns$ ) or more ( $\beta = .34, ns$ ) positive peer influence.

The second analysis of the stability of onlooker-unoccupied behavior was used to examine age effects. As with the first set of analyses, onlooker-unoccupied behavior at the second Free-Play was the dependent variable. Results for this hierarchical multiple regression are presented in table 6. There was a three-way interaction of Age X Free Play 1 Onlooker-Unoccupied X Positive Peer Influence (PI) (See Figure 3). The Age X Free-Play 1 Onlooker-Unoccupied X Positive Influence (PI) approached significance for

Table 6

*Hierarchical Multiple Regression Analyses for the stability of onlooker-unoccupied play behaviors, age and peer influences.*

Variables	Not Controlling Peers FP				Controlling Peers FP			
	Behaviors				Behaviors			
	Onlooker- Unoccupied				Onlooker- Unoccupied			
	R2	Δ R2	β	p	R2	Δ R2	β	p
Step 1	.01	.01		ns	.01	.01		ns
Age			-.10	ns			-.09	ns
Sex			.06	ns			.05	ns
Step 2	.11	.09		.002	.10	.09		.002
FP1			.30	.002			.30	.002
Step 3	.12	.02		ns	.12	.02		ns
PI			-.10	ns			-.09	ns
NI			.09	ns			.10	ns
Step 4	.15	.03		ns	.15	.03		ns
FP1 X PI			-.14	ns			-.16	ns
FP1 X NI			-.11	ns			-.11	ns
Step 5	.20	.06		ns	.16	.01		ns
Age X PI			.14	ns			.05	ns
Age X NI			.19	.079			-.09	.100
Age X FP1			-.01	ns			-.03	ns

Step 6	.31	.11	.001	.27	.11	.003
Age X PI X FP1			-.48	.001		-.44 .001
Age X NI X FP1			.03	ns		.11 ns
Model Summary	Adj. R <sup>2</sup> = .22			Adj. R <sup>2</sup> = .16		
	F(12, 90) = 3.41, <i>p</i> < .001			F (12, 90) = 2.60, <i>p</i> < .01		

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NOTE: PI= Positive Peer Influence

NI= Negative Peer Influence

FP= Free-play

Figure 2: Gender X Free-play 1 Onlooker-Unoccupied X Positive Influence (PI) on Onlooker-Unoccupied Free-play 2.

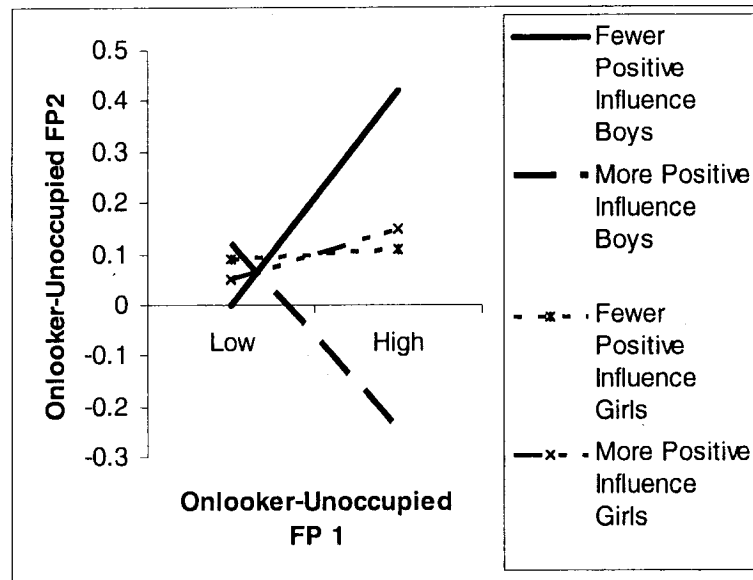
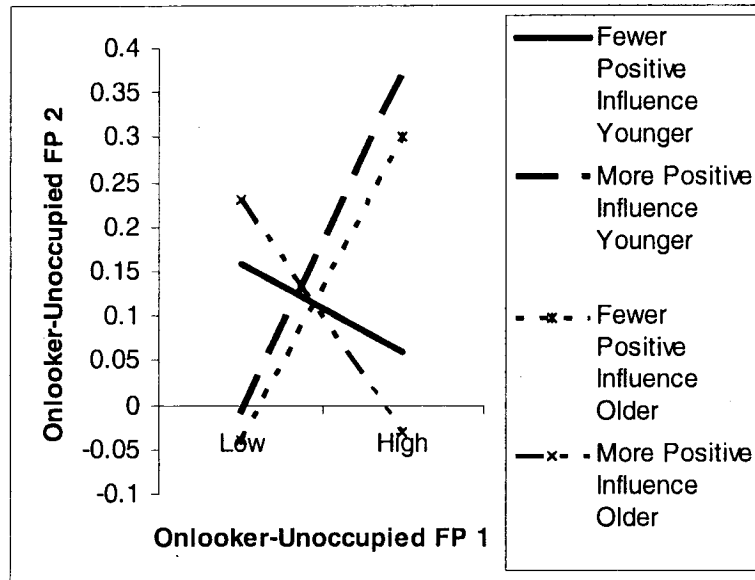




Figure 3: Age X Free-play 1 Onlooker-Unoccupied X Positive Influence (PI) on Onlooker-Unoccupied in Free-play 2.



younger ( $\beta = .39$ ,  $p < .06$ ), and was significant for older ( $\beta = -.33$ ,  $p < .05$ ) children.

Following the recommendation of Aiken and West (1991), the relation between Free-Play 1 and Free-Play 2 was examined at low and high levels of Positive Influence. Only younger children who received more positive peer influences ( $\beta = .95$ ,  $p < .05$ ) and older children who received less positive peer influences ( $\beta = .71$ ,  $p < .05$ ) showed significant consistency of onlooker-unoccupied behaviors across free-play periods. Younger children who received less positive peer influences ( $\beta = .10$ ,  $ns$ ) exhibited and older children who received more positive peer influences ( $\beta = -.27$ ,  $ns$ ) were found to inconsistently display reticence across free-play periods.

*Did accounting for associations of target child's and peers onlooker-unoccupied behaviors within free-play sessions affect the apparent stability of behaviors?*

*Overview.* In order to assess whether accounting for peers behavior within free-play sessions would affect the stability of play behaviors standardized residuals of onlooker unoccupied in free-play session 1 and 2 were used. Once again, due to a complex model and a limited sample size, interactions with gender and age were separately analyzed in order to maximize power. In all, two sets of analyses were initially conducted.

*Standardized Residual Onlooker-Unoccupied.* The first set of analyses looked at the stability of the standardized residual of onlooker-unoccupied behavior across free-play sessions and the contributions of gender, and peer effects to consistency. In these analyses, the standardized-residuals of onlooker-unoccupied during the second free-play session was entered as the dependent variable and age and gender were entered as covariates in the first step of the analysis. Results for this hierarchical multiple regression

are presented in Table 5. The same effects that approached significance in the previous analysis, not controlling for peers' play, were identified in this regression, and no new effects emerged. The standardized residual of onlooker-unoccupied during free-play 1 accounted for a significant portion of the variance in the standardized residual of onlooker-unoccupied behavior during the second free-play session. As well, an interaction, Gender X NI (Negative Peer Influences) approached significance (see Figure 4). When this interaction was broken down, girls are driving the interaction. Girls showed a significant and positive relation between negative peer influences and subsequent onlooker unoccupied behavior ( $\beta = .32, p < .05$ ), while boys showed a slightly negative slope that was not significant ( $\beta = .08, ns$ ). Finally, there was a significant 3 way interaction. The relationship between the standardized residual of onlooker-unoccupied behaviors in free-play 1 and gender and positive peer influence (see Figure 5). The Gender X Standardized-Residual Free-Play 1 Onlooker-Unoccupied X Positive Influence (PI) was significant for boys ( $\beta = -.51, p < .05$ ), but not for girls ( $\beta = .06, ns$ ) children. Following the recommendation of Aiken and West (1991), the relation between Free-Play 1 and Free-Play 2 was examined at low and high levels of Positive Influence. The consistency of onlooker-unoccupied behavior was significant for boys who received fewer positive peer influences ( $\beta = .75, p < .001$ ). Boys who received more positive peer influence displayed a negative, although not quite significant, relation between onlooker-unoccupied behaviors across free-play sessions ( $\beta = -.60, ns$ ). Girls showed similar levels of stability whether they received fewer ( $\beta = .17, ns$ ) or more ( $\beta = .34, ns$ ) positive peer influence.

Figure 4: Negative Peer Interactions X Gender on Standardized Residuals Onlooker-Unoccupied in Free-play 2.

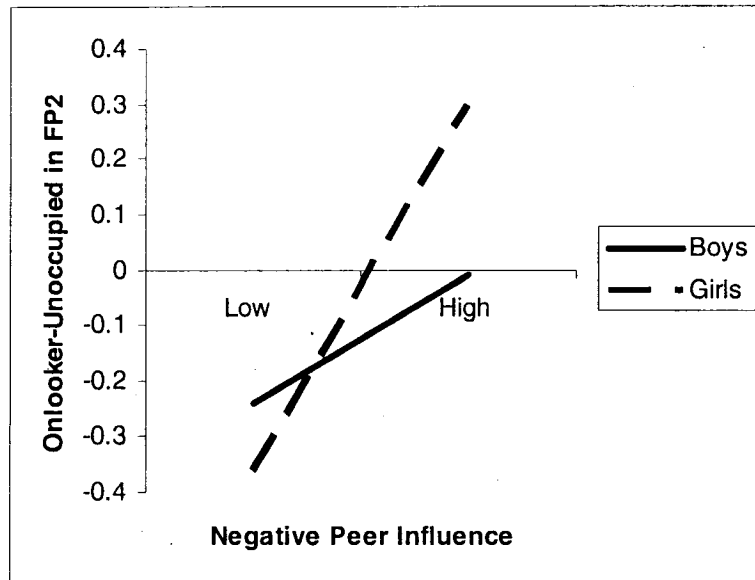
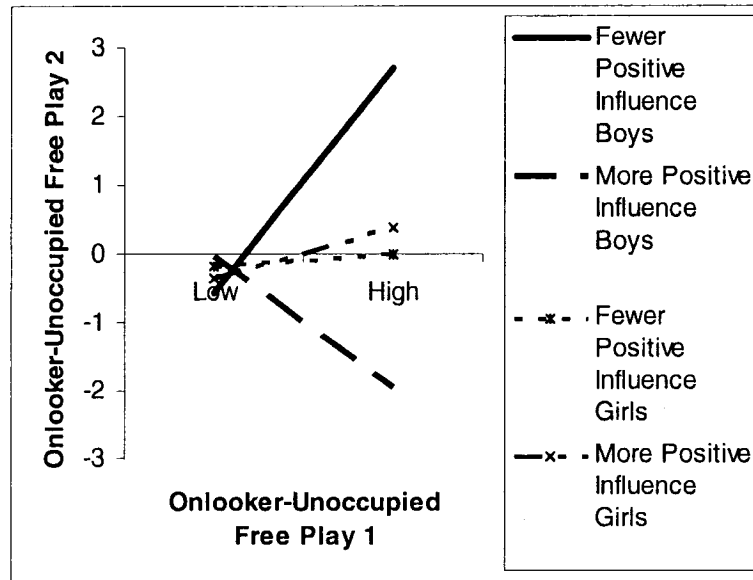


Figure 5: Gender X Standardized Residual Free-play 1 Onlooker-Unoccupied X Positive Influence (PI) on Standardized Residual Onlooker-Unoccupied in Free-play 2.

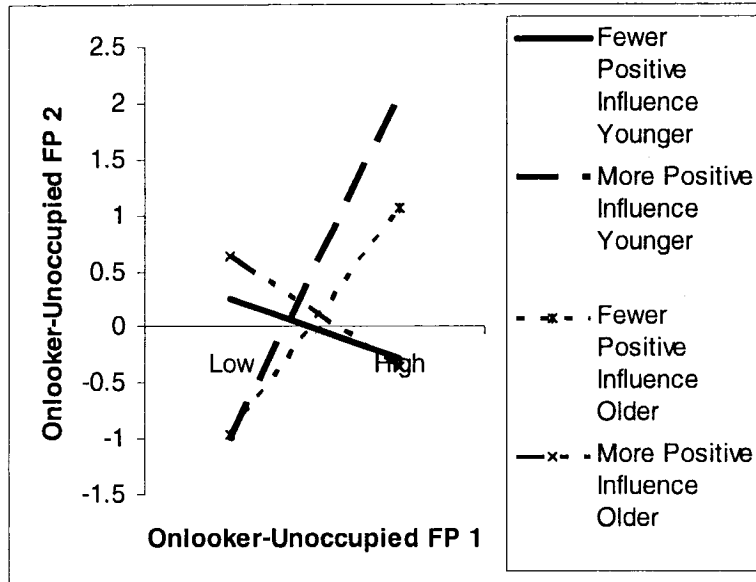


Interactions with age for stability were considered in the second analysis of standardized residuals of onlooker-unoccupied behavior, with the standardized residual of onlooker-unoccupied at free-play 2 acting as the dependent variable. The Age X Negative influence interaction no longer approached significance when peers' play behaviors were controlled. The three way interaction of Age X Onlooker-Unoccupied X Positive Influence remained significant ( $-.49, p < .05$ ) (see Figure 6). The Age X Free-Play 1 Standardized Residuals of Onlooker-Unoccupied X Positive Influence (PI) was significant for younger ( $\beta = .40, p < .05$ ), and for older ( $\beta = -.33, p < .05$ ) children. Following the recommendation of Aiken and West (1991), the relation between Free-Play 1 and Free-Play 2 was examined at low and high levels of Positive Influence. Only younger children who received more positive peer influences ( $\beta = .98, p < .01$ ) and older children who received less positive peer influences ( $\beta = .71, p < .05$ ) showed significant consistency of onlooker-unoccupied behaviors across free-play periods. Younger children who received less positive peer influences ( $\beta = .12, ns$ ) exhibited and older children who received more positive peer influences ( $\beta = -.28, ns$ ) were found to inconsistently display reticence across free-play periods.

*Did peers behavior across free-play sessions affect the individual stability of Group Play behaviors?*

*Overview.* We examined the consistency of play behavior as it relates to gender, age, and the effects of positive and negative peer interactions, by utilizing hierarchical multiple regression analyses. Due to a complex model and a limited sample size, gender and age interactions were analyzed separately in order to maximize power. In all, two sets of analyses were initially conducted.

Figure 6: Age X Standardized Residual Free-play 1 Onlooker-Unoccupied X Positive Influence (PI) on Standardized Residual Onlooker-Unoccupied in Free-play 2.



*Group Play.* The first analysis looked at the stability of group play across free-play sessions and the contributions of gender, and peer effects on that stability without accounting for peers' behavior (see Table 7). In these analyses, group play during the second free-play session was entered as the dependent variable and age and gender were controlled in the first step of the analysis. Group play was consistent from the first to second free-play. There were no other effects.

The second set of analyses for group play looked at the effects of age on consistency (see Table 8). This analysis revealed a three way interaction that approached significance. The consistency of group play was weakly moderated by age and negative peer influences. Due to the non-significance of the overall step and to the weak relation between age, negative influences, and group play across free-play sessions, no further analyses to break down this interaction were performed.

*Did accounting for associations of target child's and peers group play behaviors within free-play sessions affect the apparent stability of behaviors?*

*Overview.* In order to assess whether accounting for peers behavior within free-play sessions would affect the stability of play behaviors standardized residuals of group play in free-play session 1 and 2 were used. Once again, due to a complex model and a limited sample size, gender and age and peers influences interactions analyzed separately in order to maximize power. In all, two sets of analyses were initially conducted.

*Standardized Residuals of Group Play.* The first analysis looked at the stability of group play across free-play sessions and the contributions of gender, and peer effects on that stability accounting for peers' behavior. In these analyses, group play during the second free-play session was entered as the dependent variable and age and gender



Table 7

*Hierarchical Multiple Regression Analyses for the stability of Group-Play behaviors, gender and peer influences.*

Variables	Not Controlling Peers FP				Controlling Peers FP			
	Behaviors				Behaviors			
	Group Play				Group Play			
	R <sup>2</sup>	Δ R <sup>2</sup>	β	p	R <sup>2</sup>	Δ R <sup>2</sup>	β	p
Step 1	.12	.12		.001	.02	.02		ns
Age			.21	.028			.07	ns
Sex			-.26	.006			-.10	ns
Step 2	.21	.09		.001	.08	.07		.011
FP1			.30	.001			.26	.011
Step 3	.21	.00		ns	.09	.01		ns
PI			.04	ns			.08	ns
NI			-.01	ns			-.03	ns
Step 4	.24	.03		ns	.12	.03		ns
FP1 X PI			-.12	ns			-.19	ns
FP1 X NI			-.12	ns			.09	ns
Step 5	.26	.02		ns	.19	.07		.061
Sex X PI			-.11	ns			-.03	ns
Sex X NI			.05	ns			.03	ns
Sex X FP1			-.06	ns			-.28	.014

Step 6	.28	.03	ns	.21	.02	ns	
Sex X PI X FP1			-.16	ns		-.10	ns
Sex X NI X FP1			.10	ns		.13	ns
Model Summary	Adj. R <sup>2</sup> = .19			Adj. R <sup>2</sup> = .09			
	F (12, 90) = 2.97, <i>p</i> < .01			F (12, 90) = 1.85, <i>p</i> < .06			

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NOTE: PI= Positive Peer Influence

NI= Negative Peer Influence

FP= Free-play

Table 8

*Hierarchical Multiple Regression Analyses for the stability of Group Play behaviors, age and peer influences.*

Variables	Not Controlling Peers FP				Controlling Peers FP			
	Behaviors				Behaviors			
	Group Play				Group Play			
	R <sup>2</sup>	Δ R <sup>2</sup>	β	p	R <sup>2</sup>	Δ R <sup>2</sup>	β	p
Step 1	.12	.12		.001	.02	.02		ns
Age			.21	.028			.07	ns
Sex			-.26	.006			-.10	ns
Step 2	.21	.09		.001	.08	.07		.011
FP1			.30	.001			.26	.011
Step 3	.21	.00		ns	.09	.01		ns
PI			.04	ns			.08	ns
NI			-.14	ns			-.03	ns
Step 4	.24	.03		ns	.12	.03		ns
FP1 X PI			-.12	ns			-.19	ns
FP1 X NI			-.12	ns			.09	ns
Step 5	.26	.02		ns	.13	.02		ns
Age X PI			-.14	ns			-.11	ns
Age X NI			.04	ns			.05	ns
Age X FP1			-.08	ns			-.05	ns

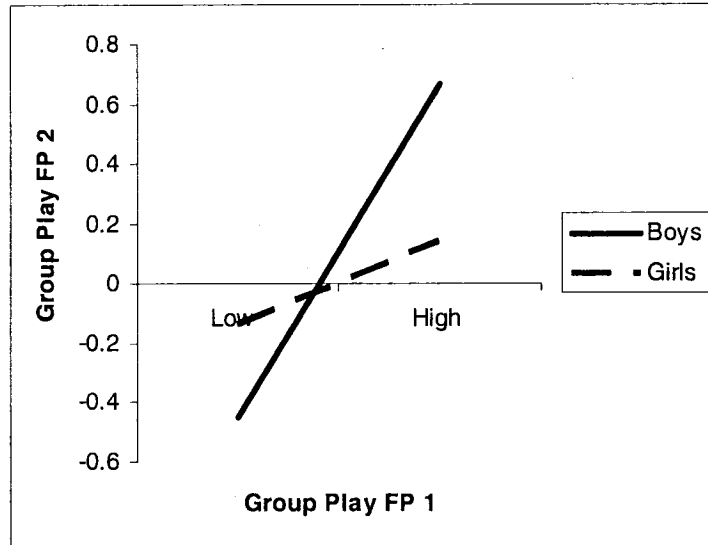
Step 6	.29	.03	ns	.16	.03	ns
Age X PI X FP1			-.08	ns		-.16
Age X NI X FP1			-.24	.073		-.17
Model Summary	Adj. $R^2 = .19$			Adj. $R^2 = .04$		
	F (12, 90) = 3.07, $p < .001$			F (12, 90) = 1.35, <i>ns</i>		

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were controlled in the first step of the analysis. Results are presented in Table 7. Group play was consistent from the first to second free-play. Also, a two way interaction revealed that boys ( $b = .56, p < .05$ ) but not girls ( $b = .13, ns$ ) displayed consistent group play behaviors across free-play sessions when peers group play behaviors were controlled (see Figure 7). There were no other effects.

The second set of analyses for the standardized residuals of group play, looked at the effects of age and group influences on the stability of the standardized residuals of group play behavior. The results are presented in table 8. No finding above the stability of group play across setting was found.

Figure 7: Gender X Group Play Free-play 1 on Group-Play Free-play 2.



## Discussion

This investigation was designed to study the effects of peers' behaviors on the short-term stability of preschoolers' play behaviors. More specifically, the goals were to a) assess the extent to which children's engagement in play behaviors was dependent on peers' play behaviors, (b) investigate the positive and negative peer influences on individual play behavior and (c) examine the ecological validity of studies of temperament and sociability that have measured children's play within peer groups. Those children who were more engaged in unoccupied or group play in the first play period were also the ones who were more reticent or sociable, respectively, in the second free-play period. Controlling for peers' play during free-play periods did not affect individual children's maintenance of play behaviors from the first to second free-play. However, how peers acted toward children in the intervening activities made contributions toward their tendencies to maintain reticent or sociable play behaviors. Broadly speaking, peers' positive engagement during the cooperative and turn-taking activities of puzzle and speeches decreased children's reticence and increased group play, whereas peers' inattentive, competitive and disruptive behaviors had the opposite effects. However, these influences were different for boys and girls, and for younger and older preschoolers.

There was some evidence of transactional processes in children's social exchanges (Abramovich & Grusec, 1978; Furman & Masters, 1980; Gottman, 1983) as children's initial play predicted peers' subsequent behavior, which in turn predicted children's later play. Children who exhibited more onlooker-unoccupied behaviors

elicited fewer positive peer influences, and in turn, positive peer influences were negatively associated with reticence. Boys and girls appeared to differ in their sensitivity to peers' positive and negative behaviors, however. Boys who received fewer positive peer influences were more consistent in their displays of reticent behaviors across the free-plays sessions. Conversely, girls who received more negative peer influences showed more reticent behavior in follow-up free play sessions than girls who received fewer negative peer influences. There were fewer moderating effects of preschoolers' age on the relations between reticence and peers' behavior. Older children who received fewer positive peer influences displayed consistent reticence across free-play periods, and, curiously, younger children who received more positive peer influences showed consistent reticence across the free play periods. In terms of children's engagement in group play, although positive peer influences were positively correlated with group play in the free-play sessions, when age, gender, and negative peer influence were accounted for, the receipt of positive peer influence did not contribute to the consistency of group play. Although there was a tendency for older children who received fewer negative peer influences to exhibit the greatest consistency in group play behaviors across the free-play session, this association was absent once peers' group play behaviors were accounted for. Overall, boys' group play behavior was more consistent across sessions than was girls'.

#### *The contributions of peers' play to individual play*

Researchers such as Cairns (1988) and Magnusson (1998) have highlighted the importance that peers can have on individual behaviors. For play behaviors, an association between individual play and peers' play is dependent on the types of play the children are engaged in. Although it has been suggested that reticence might depend on



with whom the child is interacting (Rubin et al., 1997), reticence did not depend on how they are playing. Within free-play sessions, the degree to which a participant displayed onlooker-unoccupied behavior, a behavioral pattern that centered on the absence of interaction, was not associated with peers' displays of reticence or with peers' group play. This supported the notion of reticence as an index of *individual* anxiety or inhibition (Rubin et al., 2003). A child who is overwhelmed by a social situation will exhibit signs of that anxiety regardless of how the peers are playing. As such, free-play interactions that involve socially withdrawn children seem to be led by the child's characteristics, such as degrees of reticence exhibited, and the physical context within which the children are interacting, more than the social contributions of peers' play behaviors.

Displays of group play, however, were positively associated with peers' social play behaviors. This finding was not surprising given that the definition of group play highlights an interaction between a child and surrounding peer(s). Interestingly, despite the positive associations between children and peers' group play, group play analyses rendered similar results whether the association between children and peers' social play behaviors was or was not controlled. In terms of group play, how peers interact outside of the free-play sessions seemed to have little effect on their social play during those activities. Socially mature children are, for the most part, unaffected by how they are treated by peers, only needing to find peers willing to play with them.

#### *Peers' influences on play*

In a departure from the majority of reticence research, Gazelle and colleagues (2005) studied the contribution of peers to individual children's displays of socially anxious behaviors. The results presented in this investigation both replicated and

expanded on Gazelle and colleagues (2005). In concert with their research, reticent children who received more negative peer interactions displayed higher levels of reticent behavior in a subsequent free-play session, compared to those receiving fewer negative peer interactions.

The present findings extended those of Gazelle and colleagues in several ways. Gazelle and colleagues focused their investigation of peer influences on 4<sup>th</sup> grade girls, and thus could not provide insight into the substantial gender differences observed in this study. Along with previous research (e.g. Coplan et al., 2000), boys and girls did not differ in the amount of socially reticent behaviors displayed across free-play sessions with unfamiliar peers, and overall showed similar levels of consistency of social withdrawal. However, when the contributions of peer behaviors during structured activities were accounted for, the consistency of reticence differed across gender. For boys, the absence of positive peer influences contributed to the consistency of reticent behaviors. Boys who showed more reticent behavior initially also elicited fewer positive peer influences, such that a negative feedback cycle of transactional influence appeared to contribute to boys' stability of socially withdrawn behaviors (Magnusson, 1998, Rubin, Bukowski, & Parker, 1998). Past research and theory has characterized reticent behavior by boys as a violation of gender norms (Caspi, Elder & Bem, 1988; Coplan et al., 2000). Finding that other boys appeared to distance themselves from reticent boys reinforces these findings, and indicates that peer interactions might be an important context affecting the development of inhibited, shy and withdrawn young boys.

Interestingly, although the receipt of negative peer influences did not affect the consistency of play behaviors across the free play periods, girls who received more

negative peer influences were more likely to display reticent behaviors in the final free-play sessions. One possible explanation for negative peer influences affecting socially withdrawn girls is that girls have been shown to use avoidant strategies when peer conflicts arise (Lever, 1978). Upon the receipt of negative peer influences, which could be understood as a form of conflict, socially withdrawn girls recoil into a behavioral pattern centered on avoidance.

This investigation also focused on preschoolers, a much younger group than the girls studied by Gazelle and colleagues (2005). Similar to older children, socially withdrawn preschoolers seemed to be susceptible to the influences of their surrounding peer group. Further, as the sample spanned all preschool ages, age effects emerged. Interestingly, younger children who received high levels of positive peer influences were most likely to display consistent reticent behaviors. A possible explanation for this finding lies in the nature of the types of activities. It is possible that very young who are socially immature show withdrawn behavior during free-play sessions, but are able to demonstrate socially competent behaviors during structured activities with adult guidance. They are able to play along with peers in the pursuit of a common goal. But when they return to unstructured play, the stress of that particular context returns and socially withdrawn behaviors are further demonstrated (Rubin et al., 2003). Due to their greater social maturity, older children who were initially reticent might understand unfamiliar peers' positive behaviors as conveying a safe context supporting their greater involvement in play. Another possible explanation is that certain aspects of positive peer influences, such as peer initiation, are aversely interpreted by socially withdrawn young children and fuel their anxiety in their subsequent interaction with peers.

### *Implications*

The findings presented today both support the ecological validity of the unfamiliar peer group procedure for looking at individual children's behavioral tendencies, and provide evidence for peer influences on individual behavior. Establishing the ecological validity has far reaching consequences within the field. As noted by Rubin and colleagues (2005), it is only through behavioral observations that other measures of social behaviors can be compared. For example, Coplan and Rubin (1998) development and validation of the *Preschool Play Behavior Scale*, a teacher measure of shyness, used behavioral observations of shyness to validate the scale and demonstrated its association with reticence across situations, with familiar and unfamiliar peers. Such validation and cross-situational consistency would have been brought into question if peers' socially withdrawn behaviors were strongly associated children's shyness.

Well-established within the literature on reticence are the contributions of temperament and parental socialization to social withdrawal (Rubin et al., 2003). Along the lines of Magnusson's (1998) Person-Environment Theory and the research of Gazelle and colleagues (2005), the contention of this investigation was that a third contribution, peer influences, should be held in equal regard. Children do not behave in a vacuum unaffected by how their peers treat them. Although how peers played did not impact children's reticence, how peers treated children during structured activities outside of free-play activities did have an impact on their social withdrawal behaviors. These results point to the importance of looking at the totality of peers' interactions. If one were to focus only on targeted activities, it could lead to over- or under-estimations of the impact of peers' behaviors within those activities. Further, the impact of peers' treatment of

socially withdrawn children might give us an indication of possible intervention techniques. With the negative effects on children's lives that social withdrawal can have (e.g. Rubin et al., 2003; Caspi, Elder & Bem, 1988), efforts can be made to decrease the maintenance of this behavioral pattern in a classroom setting. Within an older preschool class, instead of placing quiet or socially withdrawn children with similarly behaved peers, teachers could create groups in which reticent children are paired with more cooperative and encouraging children, such that positive peer influences could curb socially withdrawn behaviors.

#### *Research Limitation and Future Directions*

Some limitations of the present study should be noted. First, due a small sample size and only having two free-play sessions, more sophisticated analyses were limited in power. Future research would benefit from a larger sample size and multiple observations of free-play behaviors. Also, due to the reduced sample size, global measures of peer influences were utilized. A larger sample size would also allow for the analysis of more specific peer influential behavior, such as an examination of the influence of the receipt of more or less bids of initiation, or rejection of initiation bids on the consistency of play behaviors could be investigated. Second, as the free-play behaviors were observed in a laboratory setting, it is unclear whether or how the context in which the children found themselves contributed to their play behaviors. In the future, observations conducted in a more naturalistic environment could lead to a more realistic view of how children would typically behave. Third, although there are links between social withdrawal in the context of familiar and unfamiliar peers (Coplan & Rubin, 1998), the effects of peers can depend on how well children know each other. For example, evidence has suggested that

successful peer interactions were more common between more familiar peers (Doyle, Connolly, & Rivest, 1980), and that familiar peers caused more negative peer exchanges between socially anxious girls and behaviorally normative girls (Gazelle et al., 2005). As such, by limiting peer groups to unfamiliar peers, the generalizability of the findings to everyday interactions might be limited. Future research would benefit from an investigation in which peer contributions from both familiar and unfamiliar peers are examined.

### *Summary*

This investigation examined the extent to which peers behaviours can affect the displays of reticence and socially competent behaviors. Two important findings have contributed to the existing literature on social withdrawal. First, the ecological validity of long-standing empirical investigations of reticent behaviors was established. Second, a component of Magnusson's (1998) person by environment model of behavior was supported by the analyses presented. Peers' positive and negative behaviors during structured activities contributed to target children's reticent play. Future research within the field of social withdrawal would benefit from a global model, as envisioned by Magnusson, encompassing all three components of his model: childhood characteristics, such as reticence, temperament, age and gender; situational factors, such as where the interaction is occurring (i.e. in a familiar setting or new milieu); and finally, environmental factors, such as parental and peer influences.

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Appendix A  
Play Observation Scale

## Manual and FAQ for POS Coding System

Generated by the ABCD Lab and Robert Coplan

Assembled by Paul Hastings

### TIME SAMPLING

Always remember that you are looking for the behaviour that lasts for the greatest number of seconds within a 10-second time sample. This will *not* always be the *most salient or interesting* behaviour. Sometimes two or three behaviours will occur for the same amount of time within a sample. In that case, “code up” – give the child the most socially/cognitively mature code (see hierarchy below).

Sometimes a behaviour that occurs in the final couple of seconds of a sample might clarify the meaning of what you have seen for the rest of the period (e.g., it looked like two children with lego were in “parallel play” for 6-7 seconds, but then in the last 3-4 seconds of the sample one said “Ready?” and the other said “Yup!” and they put their two creations together, revealing their shared goal and making the behaviour clearly “group play.”).

### “CODING UP” – THE MATURITY HIERARCHY

Top: Group Play/Peer Conversation  
Parallel Play  
Solitary – Exploratory/Constructive  
Interaction with Teacher  
Solitary – Functional/Dramatic  
Unoccupied/Onlooker

### INVOLVEMENT OF TEACHER

**Q:** What do you code when a child is having a tea party with another kid, and then a teacher joins in *as a playmate*?

**A:** Group play (with social initiation from teacher for event coding)

**Q:** Teacher is reading a book with children in a circle listening, but target child is looking off into space?

**A:** Take context into account, i.e. if child seems to still be listening to story then it's interaction with teacher, but if child is looking at other children playing, then it's onlooking.

**General rules:** If a child is engaged in an activity, and then the teacher joins the ongoing activity at the same level as the child, then the child's behaviour has not changed and the same code is applied.

Example: Two children were building with lego and you code the child you're watching as being in "parallel play." The teacher sits near them and starts to build with lego as well – the target child remains in parallel play.

"Interaction with teacher" is used when the teacher *initiates and maintains* an activity for a child or group of children, or when the teacher *changes the nature* of the child's activity.

Example 1: Two children were building with lego and you code the child you're watching as being in "parallel play." The teacher sits near them and asks 'What are you making?' and starts to engage the children in conversation. She might encourage them to work on a lego project together. She has altered their ongoing play behaviour, and thus the code for the target child changes from parallel play to "interaction with teacher."

Example 2: A child is playing alone with some dolls (solitary-constructive if child appears to be 'just' organizing the dolls or examining them; solitary-dramatic if the child appears to be animating the dolls and using them as characters). The teacher says "It's story time! Anyone can come listen if they want to!" or maybe "Who wants to play 'Candy Land' with me?" The target child and another child approach the teacher, and the three sit down with the book or game. As long as the activity is ongoing – the teacher is reading or playing, and the child is an active participant (including "active listening" to a story being read) – the code is "interaction with teacher." If the teacher leaves and the children continue the activity on their own, it becomes "group play." If the child's attention drifts and the child stays proximal but is no longer participating, the child has moved into "unoccupied/onlooker."

Example 3: A teacher is guiding children in an activity that she has initiated – making a pretend pie. Code "interaction with teacher." The teacher says "You have to have clean hands when you're cooking. You better go wash your hands." Two children go to the wash basin and wash their hands for a few time samples. They don't hurry or seem to be acting like they are simply fulfilling the teacher's orders – while there, they chat and gently splash water at each other. Then they return to the pie-making table. The target child would be coded as "interaction with teacher" through the first part, then as "group play/peer conversation" while at the wash basin, then returning to "interaction with teacher" as her guided activity is resumed.

**Q:** A child is standing on top of a slide looking at his teacher, who is standing at the bottom of the slide and is talking to him. He does not say anything and continues to watch her. Do we code this as "interaction with teacher" or "unoccupied/receive initiation from teacher"?

**A:** Since the child does not talk with the teacher and just stands there and watches her, we cannot code it as "interaction". We would code it as "unoccupied/receive interaction from teacher".

As it was discussed in the group discussion on coding, the full context for this scenario was that the boy was on top of the slide looking around the playground, and the teacher approached and talked to him. He continued to just look, neither

answering her nor going down the slide. No change in his behaviour, therefore he *remained* in “unoccupied/onlooker” mode.

## SOLITARY PLAY

**Q:** Child is looking for a specific block (in a trunk) to fit a tower he is making?

**A:** solitary-exploratory/constructive

**Q:** Making a cake with sand?

**A:** solitary-functional/dramatic

## PARALLEL PLAY

**Q:** I was having trouble differentiating solitary play from parallel. Is talking the key difference, and what if there is talking but the kids are not working on the same game (assuming not a shared goal, in order to rule out group play), does that still count as solitary. I guess I am just looking for a clear definition of parallel play (with specific reference to talking).

There are four key defining features for parallel: 1. The children are *proximal* (within three feet of each other); 2. they are *oriented* toward one another (e.g., do not have their backs turned); 3. they are engaged in *identical or very similar activities*; 4. and their activities are *independent* (e.g., each is building own block tower, not working on a tower together).

Talking is another matter altogether! Even if the children meet the four defining criteria, if they are talking as they work separately, then it is not parallel. It is *peer conversation*, same code as group play.

There are other cues that make it clear kids are in parallel play – most specifically, explicitly *referencing* the other child (glancing at child or activity). However, even if referencing is not seen, the parallel code is applied *if the four defining features are all there*. Simply put, it is pretty unlikely that a child would be unaware of a peer’s presence and activities in the described context. In effect, even if you cannot be certain that there is even a single reference, the other clues make parallel play the “code up default.”

A target child in this play context would only *not* get parallel play if something happened that made it very clear that it wasn’t a parallel play situation. For example, the second child leaves the task, cries out in frustration, speaks to the target child, etc., and the target child shows *no response or acknowledgement whatsoever*. This indicates the child is *not aware* of the peer (or is deliberately ignoring the peer), and is engaging in solitary behaviour.

Conversely, what looks like parallel play could be illuminated as group play if it turns out that the two children were cooperating to complete two components of one project. E.g., the two kids are stacking blocks separately, and then one child says “Okay, I’ve finished this wall of our house,” and the other says “I’m not done mine yet.”



Finally, parallel play can be coded without all four of the ‘defining features’ being present, if the target child provides a clear indication of parallel activity. E.g. Referencing another child who is playing more than three feet away, and imitating or mimicking that child’s behaviour. If a “follow the leader” type behaviour doesn’t look like it is mutually shared – specifically, if the leader seems unaware of the follower’s presence and doesn’t realize that s/he is being copied – then it’s solitary for the leader (but I think you could still code parallel for the follower).

Specific questions related to parallel play:

**Q:** Child is rolling down a hill with another child rolling after her?

**A:** Most likely parallel if she realizes that he is following her, but harder to code

these outdoor behaviours...

(*Note:* We’ll do our best to stick to indoor free play for this investigation.)

## **GROUP PLAY/PEER CONVERSATION**

**Q:** Two little girls are engaged in group play for several minutes. At one point, the target child goes to the other side of the playground to bring some sand. She stays in the sandbox for several minutes, filling her bucket with sand, and as she does that she is talking to herself. From the time that she leaves her friend to the time that she comes back, do we code it as “group play” because the two girls still share the same goal, “solitary-constructive” because she is sitting alone trying to fill her bucket, or “solitary-dramatic” because she is sitting alone and talking to herself?

**A:** Because she was alone in the sandbox for an extended period of time (several minutes), we will not consider it as “group play” anymore. We will code it as “solitary-constructive” because she has a purpose, which is to fill her bucket with sand. We will **not** code it as “solitary-dramatic” because even though she is talking to herself, she still has a goal of filling her bucket with sand, and in cases like this we “code up.”

*Additional clarification from PDH:* If the target girl had been prompt about filling the bucket with sand – went to the sandbox, put some effort into filling it in a reasonable time span (e.g., a few samples), and immediately returned to the peer when the bucket was filled – then it would be appropriate to keep the few samples of bucket-filling as “group play” because it would be clear that she was keeping the shared goal foremost in mind.

**Q:** A boy was playing house with a bossy girl (*sometimes*). The bossy girl would tell the boy what to do and then she would leave. A few minutes later she would come back and give additional instructions to the boy. The little boy took it well but seemed very

immersed in the task he was doing when the girl was not present. He was only aware of and interacting with the girl when the girl was telling him what to do. My question: Would this be considered solitary-constructive/exploratory because of the large amount of time in which the boy was playing alone in a personal goal oriented way, or would this be group play because of the larger goal of playing house with the girl?

**A:** If the boy contributed more to the overall goal of "playing house" and seemed concerned for that larger goal (e.g., initiating contact with the girl, eye contact, more similar play, playing close together), then it would be appropriate to code it as group play. However, since the boy was very solitary in his play behaviour and didn't seem concerned with the girl, the answer is *solitary-exploratory/constructive when he's playing alone*, and *group play/peer conversation when the girl interacts with him*.

**Q:** If a child gets into a dispute -- like an object struggle, or an argument -- that lasts for most of a time sample, is it group play/peer conversation? Does the target child have to *want* the peer interaction to get the code, or does "unwilling group play" also count? Does group play/peer conversation have to be positive?

**A:** The way the coding system is currently set up, these disputes would be considered conversation (and thus group). In a much older version, Ken Rubin used to distinguish between positive, negative, and neutral group play and conversations, but it was extremely difficult to get reliability, so he dropped this. You can pick up the conflict in the aggression event code. (My guess is that this stuff is going to be pretty rare any way.)

*Additional clarification from PDH:* So, no, a peer interaction does not have to be positive or prosocial, and does not have to be desired by the target child, in order to be coded as group play/peer conversation.

## **EVENT SAMPLED BEHAVIOURS**

**Q:** Child is sucking necklace but doesn't seem anxious at all?

**A:** Still anxious behaviour and should be coded as such (and with event sampling, even one instance is enough to check it off in a sample).

## **RATINGS OF GLOBAL EMOTIONS**

**Q:** Can we specify what the numbers on the 5-point scale are for the emotions ratings?

**A 1:** Yes. This has been added to the coding sheets.

**A 2:** If we can't get reliable on the 5-point scale, we will make it a 3-point scale: 1 = not at all, 2 = somewhat, and 3 = always. Note that this would *only* improve reliability if coder disagreements were in the 2 to 5 range (agree on presence of emotion, but disagree on intensity). If coders disagree on the absence or presence of an emotion (one coder rates it as 1 and another rates it as anything else), then changing from a 5-point to a 3-point scale won't help...

*Thanks to all contributing parties! This is a work in progress, and can be modified and expanded as coding experience accumulates and guidelines or defaults are defined.*

**Lab Visit POS Coding Sheet**

CHILD ID: \_\_\_\_\_ CODER: \_\_\_\_\_  
 DATE: \_\_\_\_\_ TRIAD I.D.'S: \_\_\_\_\_  
 START TIME: \_\_\_\_\_ STOP TIME: \_\_\_\_\_

Time Sampling: EVERY 10 seconds

SAMPLE

BEHAVIOUR (one per sample)	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	S-11	S
Unoccupied/Onlooker												
Solitary – Exploratory/ Constructive												
-- Functional/Dramatic												
Parallel Play												
Group Play / Peer Conversation												
Interaction with Teacher												
Uncodable (out of room; out of view)												

Event Sampling: Every time behaviour is seen

	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	S-11	S
Anxious Behaviours												
Victimization/Target of Aggression												
Make Social Initiation to Peer												
Make Social Initiation to Teacher												

Appendix B  
Group Activity Scale

## LAB VISIT GROUP ACTIVITY: PUZZLE

For every 10 second time sample, assign as many behavior codes necessary to capture the totality of the target child's behavior. Also, note which peer the target child is interacting with while engaging in these behaviors.

### **Time Codes**

Start: Time CE says "Good Luck"

End: Time CE says "Great Job"

### **Cooperation Codes (subcategory specific codes)**

Initiate: Count when target child verbally and non verbally signals others in group to join (i.e. "Let's do this together", "Help?" or a wave)

Accept: Note each time child accepts either verbally or non verbally bid to cooperate through verbal or nonverbal.

Reject: Count when child refuses bid of cooperation from other children in triad. Count if direct refusal (i.e. "No!") or indirect (i.e. ignoring).

Mutual: Count when child is working with either one of or both other children on the puzzle.

### **Competition Codes (all subcategories count under competition code)**

Competitive Besting: Count when child indicates competition at hand (i.e. "It's a race", or complains (i.e. "This is unfair, you have more pieces than me").

Self Praise: Count when child indicates they are better than the others (i.e. "I am the best").

Direct Challenge: Count when child directly challenges another child (i.e. "I bet you I can do this faster than you").

### **Aggression Codes (all subcategories count under aggression code)**

Aggression: Any counts of verbal aggression (i.e. insults, entitlement expressions or physical aggression (hoarding, stealing, grabbing, stealing).

**Prosocial Codes (all subcategories count under prosocial code)**

Praise / encouragement: Behavior attempting to facilitate group interaction (i.e. “Boy, we have a lot of work to do”, “I hope we finish in time”) or to encourage the others in the group (i.e. “We can do this”, “You’re doing well”).

Mediation: Any behavior, either verbal or nonverbal, with intent to quell disagreements or mounting tension/aggression (i.e. “Shhh guys, don’t fight”).

**Off Task: Unoccupied**

Onlooker/Unoccupied: Behavior in which child sits around unoccupied or passively watching others complete the puzzle for majority of 10 second sample.

**Off Task: Distract**

Distract: Any behavior in which child is attempting to distract other children from task at hand

**Affect (subcategory specific codes)**

Neutral: Child displays behavior of no particular affective state.

Happy: Child displays behavior indicating enjoyment of the activity. Can be verbal (i.e. “This is so fun”), or physical (i.e. laughing, smiling).

Anxious: Child displays behavior indicating anxiety (i.e. fidgeting, self soothing).

Whiny: Child displays behavior indicating displeasure. Can be verbal (i.e. “This sucks”), or physical (i.e. pouting).

**LAB VISIT GROUP ACTIVITY: PUZZLE**

Coder: \_\_\_\_\_ Date: \_\_\_\_\_ Target ID: \_\_\_\_\_  
 Peer 1 ID: \_\_\_\_\_ Peer 2 ID: \_\_\_\_\_ Triad: \_\_\_\_\_  
 LV CE: \_\_\_\_\_ LV Date: \_\_\_\_\_ Time Begin: \_\_\_\_\_ Time  
 End: \_\_\_\_\_

		0-09	10-19	20-29	30-39	40-49	50-59
On task Play Alone							
<b>Cooperation</b>							
	Initiate						
	To						
	To						
	Accept						
	From						
	From						
	Reject						
	From						
	From						
	Mutual						
	With						
	With						
<b>Competition</b>							
	With						
	With						
<b>Aggression</b>							
	With						
	With						
<b>Prosocial</b>							
	With						
	With						



Off Task: Unocc							
Off Task Distr							
Affect							
	Neutral						
	Happy						
	Anxious						
	Whiny						

Appendix C  
Speech Coding Scheme

## Daycare LV: Speech Coding Manual

### TARGET CHILD CODING

Speaking order: Indicate in which order target child took turn (i.e. 1, 2, 3)

Time of CE's first request to speak: Mark time Child-Examiner first ask child to take his/her turn

# of CE requests/encouragements: Mark the number of times Child-Examiner asked child to take his/her turn.

# of Target Child refusals/protests: Mark the number of times the target child refused to take his/her turn to speak.

Target child standing or sitting: Indicate whether child was standing or sitting at the onset of his/her turn.

Rating of Target Child resistance: Rate (1-5) the child's eagerness or resistance to speak. From 1 very eager (e.g. stands up right away, excitedly volunteers) to 5 very resistant (e.g. repeated and adamant refusals to take turn).

Time Target Child's turn starts: Mark the time the target child's turn began (i.e. from Child-Examiner's 'Go').

Time turn ends: Mark the time the target child's turn ends. (i.e. from when the child responds 'yes' to examiner's "Is that all that happened").

Total Target Child speaking time (sec): Time the total amount of speaking in seconds. Pauses longer than three seconds are excluded from speaking time.

# of CE prompts to continue speaking: Mark the number of times the Child-examiner prompted the child to keep speaking (i.e. "Did you get any gifts at your party?" or "Did all your friends come to your party?").

# of CE prompts to finish turn: Mark the number of times the Child-Examiner asks the child if they are finished.

Anxious behaviour displayed: Indicate how many 10-second time segments the child exhibited anxious behaviors, including rubbing fingers, swaying back and forth, rigid posture

PEER/AUDIENCE CODING – Code the dominant behavior during the 10-second sample.

Quiet attentive: Indicate the number of 10-second time segments in which a peer is quietly watching the target child speaking.

Quiet Inattentive: Indicate the number of 10-second time segments in which a peer is quietly not paying attention to the target child speaking (i.e. looking away as the child is speaking for the majority of the segment).

Disruptive: Indicate the number of 10-second time segments in which the peers is behaving in such a manner as to disrupt the target child's turn (i.e. making inappropriate noises, throwing things, walking around, searching for toys...).

### Daycare LV: Speech Coding Sheet

Coder: \_\_\_\_\_ Date: \_\_\_\_\_ LV Date: \_\_\_\_\_ TARGET ID: \_\_\_\_\_  
LV CE: \_\_\_\_\_ Peer1 ID: \_\_\_\_\_ Peer2 ID: \_\_\_\_\_

#### TARGET CHILD CODING

Speaking order:      1      2      3

Time of CE's first request to speak: \_\_\_\_\_

# of CE requests/encouragements: \_\_\_\_\_

# of Target Child refusals/protests: \_\_\_\_\_

Target child standing or sitting?      Standing      Sitting

Rating of Target Child resistance:      1      2      3      4      5

Time Target Child's turn starts: \_\_\_\_\_ Time turn ends: \_\_\_\_\_

Total Target Child speaking time (sec): \_\_\_\_\_

# of CE prompts to continue speaking: \_\_\_\_\_

# of CE prompts to finish turn: \_\_\_\_\_

# of segments with anxious behaviour displays: \_\_\_\_\_  
(10-second time samples)

#### PEER/AUDIENCE CODING

	PEER 1	PEER 2
Quietly Attentive: (10-s time samples)	_____	_____
Quietly Inattentive: (10-s time samples)	_____	_____
Interrupt/Disrupt: (10-s time samples)	_____	_____

Appendix D  
Consent Forms

## CONSENT FORM FOR CHILD'S PARTICIPATION IN RESEARCH (Single Parent Family)

I agree to allow my child to participate in a program of research being conducted by Dr. Paul D. Hastings of the Department of Psychology of Concordia University. The purpose of the research is to examine how children with different personality characteristics develop social skills and adjust to daycare and preschool. Part of the research involves looking at the socialization experiences that children receive at home, and part of the research involves examining children's physiological activity patterns. The research program will examine whether these factors predict children's social behaviour.

For this research, my child will wear a monitor to record his or her heart rate. My child will wear the monitor on four separate occasions. My child will wear the monitor (1) for about an hour in our home today, (2) for about an hour in his or her daycare or preschool in the autumn, (3) for about an hour in a laboratory playroom in the Department of Psychology of Concordia University this winter, and (4) for about an hour in his or her daycare, preschool or kindergarten in the autumn of next year. The heart rate monitor is completely safe and records heart rate from the surface of the skin. The monitor will be held in place on my child's chest using an elasticized band, and it will transmit signals to a small receiver unit. The receiver unit will be placed in a belt-pouch that my child will wear around the waist.

My child also will be asked to provide twelve saliva samples. These saliva samples will be collected by having my child chew on a cotton pad for one minute. Two saliva sample will be collected in our home today. I will get a saliva sample on the morning of the first daycare or preschool visit this autumn. Three samples will be collected during each of the visits to my child's daycare or preschool. Finally, three samples will be collected in the laboratory playroom. The cotton pads will be stored in plastic containers and taken to a laboratory to have the saliva extracted. The saliva will be examined to determine the levels of a hormone called cortisol. This hormone occurs naturally in everyone. It is produced in the adrenal glands, and it is involved in responses to challenges and stress.

During the hour in our home, my child and I first will sit quietly and look at a children's book or watch a children's video for a few minutes. Then we will play some games. After that, my child and I will complete a set of activities. These activities include talking about pictures from a storybook, playing with puppets, completing a puzzle, using dolls to tell some stories about my child and other children, learning how to fold paper into origami shapes, and tidying up the play materials. My child will do some similar activities with my spouse. The activities involving my child and me, and my child and my spouse, will be videotaped.

During the one-hour visits to my child's daycare, preschool, or kindergarten, my child will be engaging in his or her normal activities. These visits will not be videotaped. There will be a researcher present in my child's daycare, preschool, or kindergarten for each of the visits. The researcher will observe and make notes about my child's play behaviours for the periods of time that my child is wearing the heart rate monitor.

During the hour in the laboratory playroom, my child will be observed completing some activities with two other children. These children will also be participants in this research study. They will be the same age as my child, but my child will not have met these children previously. For example, these children will not be from the same daycare or preschool as my child. The children will be asked to do several activities while they are in the laboratory playroom. First, the children will be allowed to play with a variety of toys. Second, they will be asked to put the toys away. Third, each child will be asked to sing a song or tell a story about himself or herself. Fourth, the children will work together on a puzzle. Fifth, the children will be given another toy, for them to play with together. Finally, the children will be given a snack. The activities in the playroom will be videotaped. I will bring my child to Concordia University and I will stay there while my child is in the playroom, but I will not be in the playroom with my child. However, if my child becomes upset and wants to see me, I will be brought into the playroom or my child will be brought to me.

One or more of my child's daycare supervisors, preschool teachers, or kindergarten teachers also will be participating in this research. They will be completing questionnaires that will be used to learn about my child's behaviours and emotions while engaged in the normal activities of daycare or preschool, and about my child's general adjustment to being in daycare or preschool.

As thanks for his or her participation in these activities, my child will receive four small gifts (e.g., a toy, doll, or book) worth a total of approximately \$25. One gift will be given to my child in our home, one will be given in each of the two visits to my child's daycare or preschool, and one will be given in the visit to the laboratory playroom.

I understand that I am free to withdraw my consent and discontinue my child's participation in this research at anytime, without any negative consequences. My child also will be asked to give his or her verbal assent to participate in the research, and if my child does not provide assent, then he or she will not be required to participate in the research. I also understand that I can refuse to allow my child, or my child can refuse, to do any specific part of the procedures without withdrawing from the study and without any negative consequences.

I understand that my child's participation in this study will be revealed to his or her daycare supervisors or preschool teachers. I also understand that my child's daycare supervisors or preschool teachers will be providing the researcher with information about my child's behaviour at daycare or preschool. However, in all other respects, my child's participation in this research will be confidential. That means that the researcher will not reveal the identity of my child in any written or oral reports about this study. My child will be assigned a coded number, and that number will be used on all materials collected in this study. My child's name will not appear on any of these materials. All of the physiological information, questionnaire data, and videotapes collected in this study will be stored in secure facilities at Concordia University.



In addition, I understand that information collected about my child's physiological functions will not be shared with my child's daycare supervisors or preschool teachers, and the videotape of the activities in the laboratory playroom will not be shown to them, unless I make a written request that such information be shared. Information that my child's daycare supervisors or preschool teachers provide about my child to the researcher will not be shared with me, unless a supervisor or teacher provides written permission for this information to be shared.

If I have any questions about my child's rights as a research participant, I am free to contact Concordia University's Office of Research Services, at 514-848-4887. Ms. Andrea Rodney will serve as my family's liaison for this project.

I HAVE CAREFULLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND VOLUNTARILY AGREE TO ALLOW MY CHILD'S PARTICIPATION IN THIS STUDY.

MY CHILD'S NAME (please print) \_\_\_\_\_

MY NAME (please print) \_\_\_\_\_

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

WITNESSED BY \_\_\_\_\_ DATE \_\_\_\_\_

## **CONSENT FORM FOR CHILD'S PARTICIPATION IN RESEARCH (2-parent families)**

I agree to allow my child to participate in a program of research being conducted by Dr. Paul D. Hastings of the Department of Psychology of Concordia University. The purpose of the research is to examine how children with different personality characteristics develop social skills and adjust to daycare and preschool. Part of the research involves looking at the socialization experiences that children receive at home, and part of the research involves examining children's physiological activity patterns. The research program will examine whether these factors predict children's social behaviour.

For this research, my child will wear a monitor to record his or her heart rate. My child will wear the monitor on four separate occasions. My child will wear the monitor (1) for about an hour in our home today, (2) for about an hour in his or her daycare or preschool in the autumn, (3) for about an hour in a laboratory playroom in the Department of Psychology of Concordia University this winter, and (4) for about an hour in his or her daycare, preschool or kindergarten in the autumn of next year. The heart rate monitor is completely safe and records heart rate from the surface of the skin. The monitor will be held in place on my child's chest using an elasticized band, and it will transmit signals to a small receiver unit. The receiver unit will be placed in a belt-pouch that my child will wear around the waist.

My child also will be asked to provide twelve saliva samples. These saliva samples will be collected by having my child chew on a cotton pad for one minute. Two saliva sample will be collected in our home today. I will get a saliva sample on the morning of the first daycare or preschool visit this autumn. Three samples will be collected during each of the visits to my child's daycare or preschool. Finally, three samples will be collected in the laboratory playroom. The cotton pads will be stored in plastic containers and taken to a laboratory to have the saliva extracted. The saliva will be examined to determine the levels of a hormone called cortisol. This hormone occurs naturally in everyone. It is produced in the adrenal glands, and it is involved in responses to challenges and stress.

During the hour in our home, my child and I first will sit quietly and look at a children's book or watch a children's video for a few minutes. Then we will play some games. After that, my child and I will complete a set of activities. These activities include talking about pictures from a storybook, playing with puppets, completing a puzzle, using dolls to tell some stories about my child and other children, learning how to fold paper into origami shapes, and tidying up the play materials. My child will do some similar activities with my spouse. The activities involving my child and me, and my child and my spouse, will be videotaped.

During the one-hour visits to my child's daycare, preschool, or kindergarten, my child will be engaging in his or her normal activities. These visits will not be videotaped. There will be a researcher present in my child's daycare, preschool, or kindergarten for

each of the visits. The researcher will observe and make notes about my child's play behaviours for the periods of time that my child is wearing the heart rate monitor.

During the hour in the laboratory playroom, my child will be observed completing some activities with two other children. These children will also be participants in this research study. They will be the same age as my child, but my child will not have met these children previously. For example, these children will not be from the same daycare or preschool as my child. The children will be asked to do several activities while they are in the laboratory playroom. First, the children will be allowed to play with a variety of toys. Second, they will be asked to put the toys away. Third, each child will be asked to sing a song or tell a story about himself or herself. Fourth, the children will work together on a puzzle. Fifth, the children will be given another toy, for them to play with together. Finally, the children will be given a snack. The activities in the playroom will be videotaped. I will bring my child to Concordia University and I will stay there while my child is in the playroom, but I will not be in the playroom with my child. However, if my child becomes upset and wants to see me, I will be brought into the playroom or my child will be brought to me.

One or more of my child's daycare supervisors, preschool teachers, or kindergarten teachers also will be participating in this research. They will be completing questionnaires that will be used to learn about my child's behaviours and emotions while engaged in the normal activities of daycare or preschool, and about my child's general adjustment to being in daycare or preschool.

As thanks for his or her participation in these activities, my child will receive four small gifts (e.g., a toy, doll, or book) worth a total of approximately \$25. One gift will be given to my child in our home, one will be given in each of the two visits to my child's daycare or preschool, and one will be given in the visit to the laboratory playroom.

I understand that I am free to withdraw my consent and discontinue my child's participation in this research at anytime, without any negative consequences. My child also will be asked to give his or her verbal assent to participate in the research, and if my child does not provide assent, then he or she will not be required to participate in the research. I also understand that I can refuse to allow my child, or my child can refuse, to do any specific part of the procedures without withdrawing from the study and without any negative consequences.

I understand that my child's participation in this study will be revealed to his or her daycare supervisors or preschool teachers. I also understand that my child's daycare supervisors or preschool teachers will be providing the researcher with information about my child's behaviour at daycare or preschool. However, in all other respects, my child's participation in this research will be confidential. That means that the researcher will not reveal the identity of my child in any written or oral reports about this study. My child will be assigned a coded number, and that number will be used on all materials collected in this study. My child's name will not appear on any of these materials. All of the

physiological information, questionnaire data, and videotapes collected in this study will be stored in secure facilities at Concordia University.

In addition, I understand that information collected about my child's physiological functions will not be shared with my child's daycare supervisors or preschool teachers, and the videotape of the activities in the laboratory playroom will not be shown to them, unless I make a written request that such information be shared. Information that my child's daycare supervisors or preschool teachers provide about my child to the researcher will not be shared with me, unless a supervisor or teacher provides written permission for this information to be shared.

I understand that this study is being coordinated and conducted by researchers at Concordia University. My child's daycare is not responsible for any aspect of the study. If I have any questions or concerns, I should address them to the researchers at the ABCD Lab.

If I have any questions about my child's rights as a research participant, I am free to contact Concordia University's Office of Research Services, at 514-848-4887. Ms. Andrea Rodney will serve as my family's liaison for this project.

I HAVE CAREFULLY STUDIED THE ABOVE AND UNDERSTAND THIS AGREEMENT. I FREELY CONSENT AND VOLUNTARILY AGREE TO ALLOW MY CHILD'S PARTICIPATION IN THIS STUDY.

MY CHILD'S NAME (please print) \_\_\_\_\_

MY NAME (please print) \_\_\_\_\_

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

WITNESSED BY \_\_\_\_\_ DATE \_\_\_\_\_