

Forged Through Association:
The Moderating Influence of Peer Context
on the Development and Behavior of Temperamentally-Dysregulated Children

by

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ABSTRACT

The moderating effects of five characteristics of peers—their effortful control, anger, sadness, aggression, and positive peer behavior—were investigated in two separate series of analyses of preschooler's social behavior: (a) the relation between children's own effortful control and social behavior, and (b) the relation between children's shyness and reticent behavior. Latent variable interactions were conducted in a structural equation framework. Peer context anger and effortful control, albeit with unexpected results, interacted with children's own characteristics to predict their behavior in both the EC and shy model series; these were the only significant interactions obtained for the EC model series. The relation between shyness and reticent behavior, however, showed the greatest impact of peer context and, conversely, the greatest susceptibility to environmental variations; significant interactions were obtained in all five models, despite the limited range of peer context sadness and aggression observed in this study.

DEDICATION

I dedicate my thesis to the loves of my life—to my wonderful husband (you are my rock, my mast, my agitator, and my partner in all endeavours) and to my son (*je t'aime de tout mon coeur*)—and to my parents and many mentors/educators, all of whom helped forge the woman and scholar I am today.

Thank you.

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Introduction

The literature is rife with research examining children's behavior amongst their peers and the correlates of social success. Relatively little empirical work, in comparison, has examined how the characteristics of children's peers relate to their own behavioral outcomes, particularly in early childhood. Amongst these, only a precious few studies have examined how the characteristics of children's peers moderate the relations between children's temperaments and their social behavior. Accordingly, much of the argument suggested herein is exploratory, extending existing theory and well-established bodies of research examining children's effortful control, shyness, and social behavior into the relatively unexplored terrain of peer context.

In particular, the moderating effects of five characteristics of children's peers—their effortful control, anger, sadness, aggression, and positive peer behavior—were investigated in two separate series of analyses of children's social behavior in their preschools: (a) those examining the relation between children's own level of effortful control and their social behavior, and (b) those examining the relation between children's shyness and reticent behavior, a form of social withdrawal that is typically associated with shyness. Dysregulated peer contexts, characterized by low effortful control, high negative emotionality, and high aggression, were hypothesized to engender the worst outcomes and strongest relation between effortful control and social competence, as well as between shyness and reticent behavior. The moderating role of positive peer context was expected to be more complex. In the EC/social competence models (henceforth

labeled the EC models), highly positive peer contexts were expected to have a scaffolding effect; in these conditions, all children were expected to evidence higher levels of social competence, thus weakening the positive relation between effortful control and social competence. In the shy/reticence models (henceforth labeled the shy models), on the other hand, the best outcomes and the weakest positive relation were expected in moderately positive peer contexts, whereas highly positive peer contexts were expected to have a disruptive effect, thus raising the levels of reticent behavior in all children and strengthening the positive relation between shyness and reticent behavior.

The theoretical frame in which this study is seeded is embodied in the work of Jean Piaget (1932/1965) and James Youniss (1994), who argued for the unique contribution that peers and friends, respectively, make in children's socio-moral development. Much research has been dedicated to the role children's peers play in their development, yet a myriad of questions remain about the nature of those contributions. Included amongst those, and the foundation of the author's program of research, are: (1) which peer characteristics have an impact on children's behavior and development, (2) which aspects of children's social lives are influenced by their peers, and (3) which characteristics render children more susceptible to the influence of their peers? Although the following analyses do not provide definitive answers to these three questions, their results provide some preliminary responses and insights.

Effortful Control

Effortful control (EC), an aspect of self-regulation, refers to the voluntary and effortful modulation of one's own emotions, cognitions, or behavior requiring the inhibition of a dominant response in favor of performing a deliberate, subdominant action (Rothbart & Bates, 1998). EC has been conceptualized as a construct comprised of attentional control (i.e., shifting and focusing attention), inhibitory control (i.e., the ability to plan and deliberately suppress a behavior; e.g., not grabbing the last piece of candy despite desperately wanting to eat it), and activation control (i.e., the ability to move oneself into action despite a countervailing desire to do the opposite; e.g., approaching a snake despite being frightened; Derryberry & Rothbart, 1988; see also Eisenberg, Hofer, & Vaughan, 2007; D. E. Evans & Rothbart, 2007; Moriya & Tanno, 2008; Muris, Meesters, & Blijlevens, 2007).

EC has been distinguished from reactive control, the latter referring to a relatively automatic and spontaneous reaction to one's circumstances (Derryberry & Rothbart, 1988; Eisenberg, Fabes, Guthrie, & Reiser, 2000; Eisenberg & Morris, 2002; Eisenberg & Spinrad, 2004; Kochanska & Knaack, 2003; Rothbart, Ahadi, & Evans, 2000). Reactive control is associated with both impulsivity (i.e., reactive approach) and behavioral inhibition (i.e., reactive withdrawal), wherein children's behavior is driven predominantly by their immediate impulses rather than premeditated behavior. The distinction between reactive and effortful control is made clearer by contrasting behavioral inhibition (i.e., inhibition as a reflexive pattern in response to perceived threat) with inhibitory control (i.e., the

deliberate suppression of behavior in deference to a different, premeditated response), and contrasting impulsivity (i.e., a spur-of-the-moment response style; Rothbart, Ahadi, Hershey, & Fisher, 2001) with activation control, which requires both premeditation and working against countervailing desires (Eisenberg, Eggum, Sallquist, & Edwards, 2010; Eisenberg et al., 2003). Accordingly, it is desirable to include measures of both inhibitory and activation control when assessing EC in order to distinguish between children with high EC proper and those who are inhibited. The distinction between behavioral inhibition and inhibitory control is also indirectly hinted at in the findings of quadratic effects of EC composites that do not include activation control. Carlson and Wang (2007), for instance, found that children with moderate levels of inhibitory control had better emotion regulation than did children with either high or low inhibitory control; given the argument presented above, the quadratic result suggests that the high inhibitory control category includes children who are performing well on tasks assessing inhibition due to behavioral inhibition rather than inhibitory control.

EC has been significantly associated with age, gender, and verbal ability; each of these is discussed in turn below.

EC: Relations with Age

From a developmental perspective, it is around 2 to 4 years of age that typically-developing children, having internalized their caregivers' expectations, begin to engage in self-initiated self-regulation (Kopp, 1982). With experience and instruction, children develop a larger repertoire of self-regulation tactics,

learning which can be applied broadly and which are specific to a particular set of circumstances (Kopp, 1982; see also Eisenberg et al., 2007; Eisenberg & Morris, 2002). The relation between age and EC has been substantiated empirically. In general, children's EC, both observed and reported, is positively associated with age (e.g., Carlson & Wang, 2007; Eisenberg et al., 2003; Liew, Eisenberg, & Reiser, 2004; Li-Grining, 2007; Obradović, 2010); there are, however, some exceptions in the literature (e.g., Allan & Lonigan, 2011, in which delay of gratification was not significantly related to age). There is evidence of both rank order stability (e.g., Kochanska & Knaack, 2003; Kochanska, Murray, & Harlan, 2000; Li-Grining, 2007; Raffaelli, Crockett, & Shen, 2005; Rothbart et al., 2001) and change (e.g., Dennis, Brotman, Huang, & Gouley, 2007; Kochanska et al., 2000; Kopp, 1982; Li-Grining, 2007; Raffaelli et al., 2005; Rothbart, Ellis, Rueda, & Posner, 2003) over the preschool years and beyond. The degree of growth in EC appears to decrease as the child ages, beginning as early as 8 to 9 years old (Raffaelli et al., 2005; Rothbart et al., 2003), although rates of growth might increase and decrease multiple times across the lifespan. Additionally, stability across years might differ along the developmental trajectory of children; Dennis et al. (2007) found low stability between 4 and 5 years of age, but moderate stability from 5 to 6 years of age.

EC: Relations with Gender

Gender differences have been found with respect to both observed and reported EC in children. In terms of observed tasks, girls typically perform better than do boys on a range of laboratory tasks designed to assess EC (e.g.,

Kochanska et al., 2000; Li-Grining, 2007; Obradović, 2010). Girls are also typically rated as being higher in EC than are boys (e.g., Eisenberg, Haugen, et al., 2010; Eisenberg et al., 2003; Eisenberg et al., 2005; Gunnar, Sebanc, Tout, Donzella, & van Dulmen, 2003; Kochanska & Knaack, 2003; Maszk, Eisenberg, & Guthrie, 1999; Raffaelli et al., 2005; Spinrad et al., 2004). Gender differences are also evidenced in self-reports; boys rate themselves as having less self-restraint than do girls (Crick, 1997).

Despite that gender differences have been observed across reporters, the literature provides mixed evidence regarding the presence of gender differences. For instance, Eisenberg et al. (2005; also see Liew, McTigue, Barrois, & Hughes, 2004) found gender differences in teacher-reported EC but not parent-reported EC, suggesting that gender differences might be reporter dependent. However, others (e.g., Eisenberg et al., 2003; Kochanska & Knaack, 2003; Raffaelli et al., 2005) found gender differences using parent reports, suggesting that the matter is more complicated than mere reporter differences. Additionally, Carlson and Wang (2007) found that measures of EC were not consistently related to gender; girls performed marginally better on Simon Says (a task that requires both inhibitory and activation control, as well as attentional control), but significantly worse than boys on Gift Delay, a measure of delay of gratification viz. a viz. inhibitory control in which a gift was noisily wrapped while the child was asked to look away, contrary to the delay-of-gratification results of Li-Grining (2007; see also Allan & Lonigan, 2011). Li-Grining likewise did not find that girls consistently outperformed boys on measures of EC; although they performed

better on delay of gratification tasks (Snack Delay and Gift Wrap), there was no significant gender difference on Turtle-Rabbit, a measure of the inhibition of motor control.

Despite the potential presence of mean-level gender differences, evidence of measurement invariance has been reported. In Sulik et al. (2010), partial measurement invariance held at the scalar level in which the teacher-rated EC and Rabbit-Turtle intercepts had to be freely estimated for boys and girls. Further evidence of measurement invariance has been provided by Raffaelli et al. (2005), as well as Allan and Lonigan (2011), who found measurement invariance using different measures. In addition, developmental trajectories for EC do not appear to differ by gender (Dennis et al., 2007).

EC: Relations with Verbal Ability

Receptive language skills have been significantly positively associated with some measures of EC (e.g., Simon Says, Gift Delay, and an inhibitory control composite), but not others (e.g., Forbidden Toy, an inhibitory control task in which children must abstain from touching a desirable toy while waiting for the experimenter, who had left the room), as well as parent-rated inhibitory control (Carlson & Wang, 2007). Other measures of language ability also have been significantly positively associated with composite measures of EC (e.g., Allan & Lonigan, 2011, using phonological awareness, print knowledge, and definitional vocabulary; Kochanska & Knaack, 2003, using the Wechsler Preschool and Primary Scale of Intelligence Information scale).

Shyness

Shyness refers to a response style that is characterized by a conflict between an interest to engage in social interactions with one's peers and a concomitant desire to avoid one's peers due to fearfulness or anxiety—termed the “approach-avoidance conflict” by Asendorpf (1990a, 1990b; see also Coplan & Armer, 2005). Shyness also has been referred to as conflicted shyness (e.g., Coplan, Prakash, O'Neill, & Armer, 2004) and anxious solitude (e.g., Coplan, Rubin, Fox, Calkins, & Stewart, 1994; Gazelle & Ladd, 2003; Gazelle & Rudolph, 2004). This conflict arises as a function of fear of novelty (i.e., unfamiliar persons) or social evaluation (i.e., fear of negative evaluation; Asendorpf, 1990a). As a consequence, social withdrawal is evidenced both in familiar and unfamiliar social settings (Asendorpf, 1989; Gazelle et al., 2005; Coplan, Gavinski-Molina, Lagacé-Séguin, & Wichmann, 2001).

Evidence that fear of negative evaluation is an additive component and not subsumed under novelty has been proffered by Asendorpf (1989, 1990a). The impact of the threat of social evaluation on shyness has been evidenced in undergraduate students: Greater shyness was reported by undergraduate students in an evaluative, versus control, condition (Asendorpf, 1989), and fear of negative evaluation was positively correlated with shyness in a sample of Turkish undergraduates (Koydemir-Özden & Demir, 2009). In young children, Asendorpf (1990a) found that failed attempts to initiate social interactions with peers led to increased shyness, and not that shyness led to social failure; presumably, the

failed social initiatives provoked concerns about negative evaluation, which in turn engendered greater shyness.

Shyness is distinct from both social avoidance and unsociability, two additional forms of social withdrawal. In social avoidance, peers are actively avoided without any evidence of ambivalence, whereas unsociability, or social disinterest, is characterized by neither actively seeking nor actively avoiding peer interactions (Asendorpf, 1990b, 1991; also referred to as active isolation and passive withdrawal, respectively; Rubin & Coplan, 2004). In contrast to social avoidance and social disinterest, shyness reflects a reactive withdrawal response to social stimuli (i.e., due to novelty or perceived threat, including fear of negative evaluation) despite a countervailing interest in social engagement. A multi-factor model of shyness has been substantiated in international samples (e.g., Matsushima & Shiomi, 2001, using a sample of Japanese junior high students; Nelson, Hart, Yang, Wu, & Jin, 2012, using a sample of Chinese preschoolers; Xu & Farver, 2009, with a 10-year-old Chinese children; Xu, Faver, Yu, & Zhang, 2009, with a sample of Chinese grade 1 students). Xu, Farver, Yu, et al. (2009), for instance, contrasted three different categories of shyness (i.e., shyness toward strangers, anxious shyness, and regulated shyness) that evidenced different patterns of inhibited behavior (i.e., tense, unresponsive) in laboratory setting with an unfamiliar experimenter. They found that children who were shy toward strangers evidenced inhibited behavior in the novel condition whereas children with anxious shyness exhibited inhibited behavior when mild social evaluative cues were added. In contrast, children with regulated shyness, a socially

sanctioned form intended to ease social relations (also evidenced in Crozier & Badawood, 2009), did not evidence inhibited behavior in either condition.

Shyness is related to, but also distinct from, behavioral inhibition.

Behavioral inhibition, a form of reactive control, is characterized by increased vigilance in response to unfamiliar persons and situations, as well as to challenge and danger, culminating in withdrawn behavior (Cole, Martin, & Dennis, 2004; Fox, Henderson, Marshall, Nichols, & Ghera, 2005; Kagan, Snidman, & Arcus, 1998). The coupling of increased vigilance, which has been evidenced in quicker response times to threatening stimuli on Stroop tasks, and an attention shifting deficit engenders a strong motivation not to pursue positive stimuli but to avoid negative stimuli (Degnan & Fox, 2007; MacLeod & Mathews, 1988; Pérez-Edgar & Fox, 2005). Children with inhibited temperaments evidence high reactivity and an aversive response to novelty, and are typically withdrawn, behaviorally inhibited, and disinclined toward behavioral activation (Degnan & Fox, 2007). With behavioral inhibition, unlike shyness, the withdrawal behavior is typically not evidenced with familiar peers (Asendorpf, 1990a; see also M. A. Evans, 1996, in which reticence was operationalized in terms of verbal contributions). Inhibited temperaments have been associated with poor social adjustment and social withdrawal (Degnan & Fox, 2007), as well as internalizing disorders, particularly anxiety and mood disorders (e.g., depression; Biederman et al., 2001; Degnan & Fox, 2007).

Given the overlap between these two concepts, it is not surprising that behavioral inhibition is significantly positively associated with shyness (e.g., Fox,

Henderson, Rubin, Calkins, & Schmidt, 2001; Hastings, Rubin, & DeRose, 2005; Rubin, Nelson, Hastings, & Asendorpf, 1999; see also Biederman et al., 2001, for links between behavioral inhibition and social anxiety). Despite the similarities (e.g., both reflect a form of reactivity, rather than a deliberate response, that is associated with vigilance and withdrawal), there are important distinctions. Behavioral inhibition encompasses wariness of novelty in both social and nonsocial domains; the withdrawal behavior associated with it typically extinguishes with familiarity. Shyness, in turn, refers specifically to inhibition in both familiar and unfamiliar social situations that might be borne from a fear of social evaluation, which is not evidenced in behavioral inhibition. The distinction between the different sources of social withdrawal has been evidenced at different ages and in different cultures (Asendorpf, 1989, 1990a; Fox et al., 2001; Matsushima & Shiomi, 2001; Rubin, Burgess, & Hastings, 2002; Xu & Farver, 2009).

Shyness has been significantly positively associated with slow-to-warm and difficult temperaments in infancy (Grady, Karraker, & Metzger, 2012), negative reactivity (i.e., distress and fear) both within and across time (Fox et al., 2001; Henderson, Fox, & Rubin, 2001; Kagan et al., 1998), lower assertiveness (Findlay & Coplan, 2008), poorer learning behaviors (i.e., preschool intercept, but not the slope; Domínguez, Vitiello, Maier, & Greendfield, 2010), greater loneliness in childhood (Findlay & Coplan, 2008), and depression (Nelson et al., 2012). In terms of interactions with peers, shy children are lower on aggression (Asendorpf, 1990b; see also Scholte, Engels, Overbeek, de Kemp, & Haselager,

2007, for adolescents), make fewer social initiations than their non-shy counterparts (Asendorpf, 1991; Coplan et al., 2004; Hinde, Stevenson-Hinde, & Tamplin, 1985), and engage in parallel play (Asendorpf, 1990b; Coplan et al., 2004) as well as social withdrawal (Asendorpf, 1990a; Coplan et al., 2001; Coplan & Rubin, 1998; Coplan et al., 1994; Henderson et al., 2001; Rubin et al., 2002; cf. Asendorpf, 1991, who found that shyness was initially negatively associated with parallel play and then became nonsignificant). Anxious solitude (i.e., shyness) has been significantly positively associated with peer exclusion as early as kindergarten and depression in later childhood (Gazelle & Ladd, 2003; Gazelle & Rudolph, 2004). Shyness also has been found to have implications for relationships and occupations in adulthood (e.g., Caspi, Bem, & Elder, 1989; Caspi, Elder, & Bem, 1988; Kerr, Lambert, & Bem, 1996). Accordingly, being shy potentially has implications for social relationships across the life span.

Shyness: Relations with Age

The stability of shyness over time has been evidenced in a number of studies (e.g., Asendorpf, 1990b; Grady et al., 2012; Kagan et al., 1998; Rubin et al., 1999). Kagan et al. (1998) found that early social fearfulness endured, as did Rubin et al. (1999), who found moderate stability in mother-reported shyness and modest stability in father-reported shyness. In Eggum et al. (2012), mother-rated shyness also was moderately stable in young children (6 to 12 years old), whereas teacher-rated shyness evidenced modest stability. Significant positive correlations amongst measures of shyness collected at 24 months, 36 months, 54 months, and grade 1 were also evidenced in Grady et al. (2012), although the

associations were weaker across longer periods ($r_s = .35$, for 24 months with grade 1 shyness, to $.57$, for 54 months to grade 1 shyness). In addition to rank-order stability, change in mean shyness also has been observed over time. In a longitudinal study that followed participants from 4 to 23 years of age, shyness decreased over time (Dennissen, Assendorpf, & van Aken, 2008). Grady et al. (2012) also provided evidence of discontinuity; a growth curve analyses of shyness at 24 months, 36 months, 54 months, and grade 1 evidenced poor fit, suggesting substantial heterogeneity not captured by the model.

Although there is a nonsignificant association between age and shyness (Crozier & Badawood, 2009; Spere & Evans, 2009), zero-order correlations between shyness and behavior in social settings appear to differ with age. Hinde et al. (1985) found intercorrelations of different strengths at 42 and 50 months between shyness and dependent behavior (i.e., clinging to adults, asking for help, and crying if left alone; $r = .31, p < .05$, at 42 months and $r = .64, p < .001$, at 50 months), as well as shyness with activity ($r = -.05, ns$, and $r = -.41, p < .05$, at 42 and 50 months respectively) and aggressiveness ($r = -.26, ns$, at 42 months and $r = -.32, p < .05$, at 50 months); in each case, the relations were stronger at the later time.

Shyness: Relations with Gender

Although a few studies have suggested that females are more likely to be shy than are males (e.g., Chen, Chang, & He, 2003; Chen, Wang, & Wang, 2009; Scholte et al., 2007; see also Biederman et al., 2001, albeit only marginally so), the literature tends to suggest a lack of relation between gender and shyness (e.g.,

Coplan & Armer, 2005; Coplan et al., 2001; Crozier & Badawood, 2009; Crozier & Hostettler, 2003; M. A. Evans, 1996; Fox et al., 2001; Kagan et al., 1998; Phillipsen, Bridges, McLemore, & Saponaro, 1999; Rubin et al., 1999; Spere & Evans, 2009). Despite this, it has been suggested that shyness is a greater risk factor for boys than girls, a difference that has been attributed to socialization factors (i.e., that shyness is perceived as less desirable in boys than girls; e.g., Coplan & Armer, 2005; Coplan et al., 2001; Fox, 2004; Rubin & Coplan, 2004). Gender differences have been observed at an early age. For instance, a significant positive correlation was observed between negative reactivity at 9 months old and social wariness at 48 months for boys only; a nonsignificant correlation existed for girls, and the difference in the correlations was significant (Henderson et al., 2001). Here again, however, mixed results have been obtained; whereas boys have evidenced greater stability in shyness in some studies (e.g., Gazelle & Ladd, 2003), the shyness of slow-to-warm boys also has been shown to decrease more quickly than that of slow-to-warm girls (Grady et al., 2012). Although gender differences might exist in the mean level and correlates of shyness, the measurement model for shyness is reported to be gender invariant (Nelson et al., 2012).

Shyness: Relations with Verbal Ability

A significant negative association between receptive language skills and shyness has been reported (e.g., Crozier & Badawood, 2009, even after accounting for both gender and amount of preschool experience; Crozier & Perkins, 2002; Rubin, 1982). It is important to note, however, that studies can be

found that both support and challenge a relation between reticent behavior and receptive language skills. For example, Rubin (1982) found that receptive language was significantly negatively related to onlooking in preschoolers, whereas Howes et al. (2011) found that receptive language was not significantly related to peer-rated anxious/withdrawn and anxious/fearful behavior despite utilizing the same age group and the same measure of receptive language. Further, the relation between shyness and verbal ability can change with age; Spere and Evans (2009) found that shyness significantly negatively predicted both receptive and expressive vocabulary in kindergarten, but not in grade 1.

Studies suggest that such differences might be accounted for by the choice in referent group and variations in testing approaches. Shy children have been rated as having significantly inferior verbal communication skills compared to their sociable peers but not in comparison to children who showed more mixed behavior patterns (i.e., children who started the year as quiet but became more talkative; M. A. Evans, 1996, testing kindergarten and grade 1 students). Crozier and Badawood (2009) similarly showed that shy and mixed groups of children did not significantly differ from each other, although they did significantly differ from the non-shy children on a measure of receptive vocabulary. In terms of setting and testing differences, Crozier and Hostettler (2003) found that shy grade 5 students performed significantly worse than their non-shy peers on a vocabulary test in a face-to-face setting, but their scores did not differ significantly in a more anonymous group setting.

It is important to note, however, that scoring more poorly than others is not akin to doing poorly. The work of Spere, Schmidt, Theall-Honey, and Martin-Chang (2004) highlighted that shy children in their study had lower receptive language skills than their peers, their skills were at age level—the significant difference occurred because their non-shy peers substantially exceeded age-related expectations. Similarly, although shy children performed significantly poorer on expressive language skills (Spere et al., 2004; see also M. A. Evans, 1996), Spere et al. found that they did not perform below age level. Taken together, these findings provide a more nuanced understanding of the possible relations between verbal ability and shyness.

Shyness: Relations with Preschool Experience

Time in preschool (in years) has been associated with shyness; non-shy children were significantly longer in preschool than were shy peers (Crozier & Badawood, 2009). Based on these results, however, it is unclear whether shy children enter preschool later or whether entering preschool earlier lessens shyness. Research on behavioral inhibition suggests that it might be the latter; being in placed in daycare at an earlier age was associated with change, rather than stability, in behavioral inhibition (Fox, 2004). Nevertheless, given that shyness differs in important ways from behavioral inhibition (i.e., the former involves fear of negative evaluation), it is not clear how preschool exposure would impact shyness; repeated exposure to a preschool environment perceived as threatening might serve to aggravate, rather than diminish, shy children's social withdrawal. Correlations also might differ as a function of time in school;

Spinrad et al. (2004) found that reticent behavior increased over the course of a school year.

Social Competence

The construct of social competence speaks to a person's success in navigating, and their positioning within, their social environment—otherwise referred to as social efficacy (Adams, Ryan, Ketschis, & Keating, 2000; Wright, 1980). The defining characteristics of social competence include self-understanding, independence, assertiveness, social sensitivity, ability to make friends, and social problem-solving skills (Roedell, 1985), as well as emotion awareness and understanding (Denham, Zahn-Waxler, Cummings, & Iannotti, 1991; Saarni, Campos, Camras, & Witherington, 2006; see also Dennis et al., 2007; Foster & Ritchey, 1979; Gresham & Reschly, 1987; Lillvist, Sandberg, Björck-Åkesson, & Granlund, 2009). Asher (1983) framed social competence as consisting of relevant responses that reflect a process-oriented perspective (i.e., a recognition “that relationships develop and relationship problems are solved over time,” p. 1429). In North American culture, social competence is typically conceived as being an active, but controlled (i.e., well-regulated) social agent (Chen & French, 2008). So defined, social competence has been operationalized in terms of play behavior (i.e., with peers), the effectiveness of children's attempts at social influence (e.g., leading peers, seeking their attention, and using peers as instrumental resources; Wright, 1980), the interpersonal outcomes derived as a function of the nature of one's relationships with other social agents (e.g., peer liking or status), the ability to behave in a socially appropriate manner and comply

with adult requests (e.g., Chen et al., 2009), or some combination thereof (see also Foster & Ritchey, 1979).

The variety of measures utilized in studies is of great import, as adequately capturing the breadth of this construct requires a multi-method measurement approach. Odom and McConnell (1985; see also McConnell & Odom, 1999) argued that multiple perspectives are required to adequately represent a child's competence as a social agent. Odom and McConnell, who argued that "the relative competence of an individual child's social performance is systematically evaluated by assessing the social impact of that behavior upon others in the child's environment" (p. 9), advocated for a performance-based approach to defining and measuring social competence in which subjective ratings are obtained both from a variety of people who interact with the child (i.e., multiple reporters) and from direct behavioral observation. In the following analyses, social competence was operationalized in terms of peer reports of liking, teacher reports of popularity, and observed peer-oriented behavior (i.e., parallel and social play). Group-oriented play and peer ratings of liking were found to be significantly positively associated in preschoolers and kindergarteners (Rubin, Daniels-Beirness, & Hayvren, 1982).

Peer Preference

Peer preference ratings represent the degree to which a child's peers enjoy, for example, playing with or working with that child (see Singleton & Asher, 1977; Asher, Singleton, Tinsley, & Hymel, 1979). The rating scales used with the task can vary, but those typically used with young children involve asking them to

rate each of their participating peers using a three-point response scale designated with happy, neutral, and sad faces (Asher et al., 1979). Ratings of peer preference serve as an alternative to assessing sociometric status that does not require the use of negative nominations—a potentially sensitive issue for parents, teachers, school administrators, or ethical boards, particularly when young children are involved. Moreover, peer ratings appear to have better test-retest reliability with preschoolers than do methods utilizing positive and negative nominations (Asher et al., 1979).

Popularity

Sociometric status (e.g., being rejected or popular) is a group-level variable that is typically derived from peers' ratings or nominations, although alternative techniques are available such as teachers' or parents' reports of popularity, self report, or observations of children's interactions. Popularity refers to a social position within a group in which the popular person is esteemed in the eyes of the group as a whole (Ladd, 2005), and reflects the degree of acceptance by peers (Mendelson, Aboud, & Lanthier, 1994). In the social networks literature, popularity refers to receptivity and is assessed in terms of the number of nominations an actor (e.g., a person) receives from all the other actors in the network (Wasserman & Faust, 1994). Popularity (and, more broadly, peer status), however, should not be confused with friendship status; Parker and Asher (1993), for instance, found that many low-accepted children had best friends whereas nearly one-third of the high-accepted children did not. To this end, Mendelson et al. (1994) provided evidence of disparate correlates of the two

concepts, thus substantiating the distinction between them. The correlates of popularity in kindergarten included attractiveness and social skills such as the ability to appropriately initiate social interactions and the ability generate a variety of initiation approaches (Mendelson et al., 1994).

Play Behavior

Play is a pleasurable activity pursued either individually or with others, which requires, and enhances, a range of social, emotional, and cognitive competencies (Göncü, Mistry, & Mosier, 2001; Parten, 1932; Rubin, 1982; Rubin, Maoioni, & Hornung, 1976; Saracho, 1999). Two approaches to categorizing children's play behavior have served as touchstones in the literature. First, a paradigm developed by Parten (1932), which was based on naturalistic observations of 42 preschoolers over the course of a school year. Parten (1932) identified six categories of play ranging from non-play (i.e., unoccupied and onlooker) to non-group play (i.e., solitary independent) to group-oriented play (i.e., parallel, associative, and cooperative). Second, Rubin and colleagues (Rubin, 1982; Rubin & Coplan, 2004; Rubin et al., 1982; Rubin et al., 1976; see also Coplan et al., 1994) developed a rubric of play defined by two dimensions: degree of sociality (i.e., solitary, parallel, and group; drawing on Parten's, 1932, work) and cognitive complexity (i.e., functional-sensorimotor, constructive, and dramatic, from lowest to highest; drawn from Smilansky's, 1968, Piagetian coding schema). For example, parallel-constructive play—which has been positively associated with sociometric status, as well as social and cognitive problem-solving skills—involves manipulating materials for the purposes of

creation while playing near, but not with, other children who are engaging in a similar task. Additional play categories included onlooker and unoccupied behavior. Although these two coding schemas are not always used in their entirety, they underlie much of the research incorporating observations of children's play behavior, both in naturalistic and laboratory settings.

Reticent behavior and peer-oriented forms of play were examined in the following analyses. Reticent behavior encompasses both onlooking (i.e., observing other children playing but not participating) and unoccupied (i.e., distracted, restless, and aimless non-play activity) behavior (Asendorpf, 1991; Coplan et al., 2001; Coplan et al., 2004; Coplan et al., 1994; Henderson et al., 2001; Henderson, Marshall, Fox, & Rubin, 2004; Nelson et al., 2012; Parten, 1932; Rubin, 1982; Rubin et al., 2002; Rubin & Coplan, 2004; Spinrad et al., 2004). Onlooking and unoccupied behavior have been associated with negative outcomes (e.g., social maladjustment), although less so than some forms of solitary play (i.e., solitary-functional and solitary-dramatic; Rubin, 1982). Peer-oriented play, in turn, reflects Parten's (1932) three categories of group-oriented play (i.e., parallel, associative, and cooperative play), and combines the six different categories of parallel and social play identified by Rubin and colleagues (Rubin, 1982; Rubin & Coplan, 2004; Rubin et al., 1982; Rubin et al., 1976; see also Coplan et al., 1994). In parallel play, children engage in a similar activity as their peers in a shared space but maintain some independence. Social play, which combines Parten's associative and cooperative categories, entails an element of explicit relatedness (e.g., discourse about a common activity) or collaborative

organization around a common goal under which individual interests are subsumed.

It has been argued that the adaptiveness and benefits of a particular form of play depends on the characteristics of the child (e.g., age) and the context (e.g., the number of peers available and the nature of their activities). Engaging in more group-oriented play would be considered characteristic of preschoolers in a group context in North American society, whereas engaging in predominantly solitary play or reticent behavior is less developmentally appropriate and might be indicative of poor adjustment (Rubin, 1982; Rubin et al., 1976). In fact, Rubin (1982) described parallel-constructive play as a fundamental preschool activity. Some onlooking behavior, however, is both developmentally and contextually appropriate; preschool children typically evidence onlooking behavior when they first enter preschool, and onlooking can be a useful entry strategy with an unfamiliar peer or group of peers (Asendorpf, 1990b, 1991). The question, then, is not whether reticent behavior occurs, but whether its occurrence in any particular child is enduring and disproportionate to one's peers, reflecting an underlying response style rather than a function of age or circumstance.

Social Competence: Relations with Shyness

Shyness has been positively associated with reticent behavior during free-play periods (e.g., Asendorpf, 1990b; Coplan et al., 2001; Coplan & Rubin, 1998; Coplan et al., 1994; Henderson et al., 2001; Rubin et al., 2002), as was parallel-constructive play (Asendorpf, 1990b; Coplan et al., 2004). Shy children evidenced reticent behavior among both familiar peers (Asendorpf, 1990a; Coplan

et al., 2004) and unfamiliar peers (Asendorpf, 1990a, 1991; Coplan et al., 1994; Fox et al., 2001; Rubin et al., 2002). Although shy children were found to engage in parallel play, they evidenced less social interactive behavior than their non-shy peers (Asendorpf, 1991) and made fewer social initiations (Asendorpf, 1991; Coplan et al., 2004; Hinde et al., 1985). Moreover, the duration of social interactions appeared to decrease with age for shy children (i.e., from 4 to 8 years old); Asendorpf (1991) found a group-by-age effect wherein non-shy children engaged in longer periods of social/parallel play with age, whereas shy children tended to engage in shorter periods of social/parallel play.

Relations between shyness and sociometric status have been found, although the results are mixed. Some studies found nonsignificant relations between reticent behavior and sociometric ratings (Rubin, 1982), and between shyness and teacher ratings of perceived peer acceptance (Coplan & Armer, 2005). Nonsignificant relations, however, were not universal; peer-rated shyness-sensitivity significantly positively predicted positive sociometric nominations in a rural migrant Chinese sample and positively predicted negative sociometric nominations in both urban and rural Chinese samples (Chen et al., 2009). In contrast, in North American children, shyness significantly negatively predicted liked-most scores, but had nonsignificant relations with liked-least scores (Scholte et al., 2007; see also Phillipsen et al., 1999, in which teacher-rated peer acceptance was negatively associated with shyness). Some data suggest that the observed differences in association patterns might reflect the impact of the broader social context in which the samples are embedded: Shyness-sensitivity

significantly negatively predicted teacher-rated social competence in a Chinese urban sample, but was significantly positively related in a Chinese rural migrant sample (Chen et al., 2009). Additionally, the characteristics of the peer context might moderate the relation between children's reticent behavior and their peer status: Stormshak, Bierman, Bruschi, Dodge, and Coie (1999) found that withdrawn behavior was significantly positively related to peer status in classrooms in which withdrawn behavior was prevalent, but had a nonsignificant relation in classrooms low in withdrawn behavior.

As noted above, the evidence suggests that engaging in predominantly onlooking and unoccupied behavior is associated with inhibited and anxious temperaments. Nevertheless, there is evidence that contradicts these findings; Spinrad et al. (2004), for instance, found that reticent behavior was not related to social anxiety. The conflicting findings might arise from differences in methodology: Whereas Coplan et al. (1994) observed their participants over two free-play sessions in play groups of four children unknown to each other, Spinrad et al. observed participants in their preschools, both inside the classroom and in the playground, over the course of a school year. It might be, then, that the setting employed by Coplan et al.—a laboratory setting with three unfamiliar peers—disproportionately drew out reticent behavior in socially anxious children. In a more familiar setting, shy children might engage in parallel play, retreating to reticent behavior only under more stressful play conditions. Additionally, reticent behavior appears to be a typical part of a preschooler's repertoire; Parten (1932) found that all the children in her study evidenced some reticence, and that it was

evidenced relatively infrequently despite the fact that the study extended over most of the school year. The play context, it turns out, might have important repercussions for the relations between children's shyness and their behavior in the company of their peers.

Social Competence: Relations with EC

Controlling for age and gender, EC positively predicted peer competence, which included peer liking, in a sample of 5 to 6 year olds (Obradović, 2010). Both teacher- and parent-reported EC were significantly positively related to teacher-rated popularity and social status (i.e., peer preference), as was effortful control observed in a laboratory setting (hereinafter referred to as lab EC), although it only had a marginal relation with teacher-rated social status (Eisenberg et al., 2003). Similarly, attentional control, an aspect of EC, has been significantly positively associated with sociometric status (i.e., peer preference) in preschoolers after controlling for age, but for boys only (Eisenberg et al., 1993; relation held for Spring semester, but not the Fall semester). Low EC, when combined with negative affect, predicted low peer status five months later, even after controlling for initial social status levels (Maszk et al., 1999). Poor EC, however, does not necessitate poor peer status; Gunnar et al. (2003) found that the path between a composite of low EC and surgency to peer rejection was not significant in the absence of aggression. Thus, despite that there is some support in the literature for relations between EC and peer status, a child's EC alone is not necessarily indicative of their social competence in a particular play setting;

rather, consideration also needs to be given to the quality of the children's peer relationships and social interactions.

Social Competence: Relations with Age

In a study of preschoolers, Rubin et al. (1976) found that the following play categories occurred in decreasing frequency: parallel play, associative play, solitary play, and cooperative play. Thus, although it is developmentally and situationally appropriate for 3 to 4 year olds to exhibit some reticent (and solitary play) behavior (Asendorpf, 1990a; Parten, 1932; Rubin, 1982), they would be expected to engage in more parallel and social play when amongst their peers (Rubin, 1982; Rubin et al., 1976). The proportion of reticent behavior, however, would be expected to change with age: A negative association between age and reticent behavior was reported in a number of studies (e.g., Parten, 1932; Rubin, 1982; Rubin & Krasnor, 1980, both at a group and individual level). In terms of age-related differences, 4 year olds tended to engage in more social play relative to younger children, whereas 3 year olds tended to engage in more parallel play (Rubin & Krasnor, 1980). Children's positive play interactions with peers were moderately stable between the Fall and Spring in preschoolers (Cohen & Mendez, 2009).

Popularity was found to have a significant positive correlation with age, even after partialing out sex, verbal and communication skills, and class membership (Galejs, Dhawan, & King, 1983). Additionally, popularity has been reported to be relatively stable from ages 7 to 12 (Brendgen, Vitaro, Bukowski, Doyle, & Markiewicz, 2001), but has evidenced a significant linear decline, with

a negative association between the intercept and slope, in adolescence (Cillessen & Borch, 2006). The degree of stability found, however, might be related to the identity of the informant; whereas teacher-rated popularity was highly stable, peer-rated popularity was less so (Wu, Hart, Draper, & Olsen, 2001).

Social Competence: Relations with Gender

Gender differences have appeared in the social behavior of shy children; Hinde et al. (1985) found that 50-month-old shy boys were more likely to play interactively with their peers, whereas shy girls tended to be more passive. However, no sex differences were observed in reticent behavior (Rubin et al., 1976), nor in the relations between shyness and observed reticent behavior (Coplan et al., 2001). Although popularity was not significantly associated with gender in Galejs et al. (1983; see also Cillessen & Borch, 2006), girls received significantly more positive sociometric nominations in other studies (Chen et al., 2003; Chen et al., 2009). Gender differences, thus, can be expected in some aspects of play behavior and sociometric status.

Social Competence: Relations with Verbal Ability

A significant positive association between receptive language skills and children's social competence with peers was observed in Cohen and Mendez (2009). A significant positive zero-order correlation was also observed between verbal ability and popularity in Galejs et al. (1983); this relation was not significant, however, when age, sex, other communication skills (i.e., listening and describing), and class membership were partialled out. As noted in the preceding section, there are mixed findings regarding the relation between

receptive language skills and reticence; differences might be expected, however, given the multiple dimensions that underlie social withdrawal.

Social Competence: Relations with Preschool Experience

Time in preschool has been significantly associated with social competence (i.e., social efficacy assessed in terms of leadership, obtaining peer attention, and using peers as resources; Wright, 1980). Although time was measured in that study in terms of years (one versus two) and semesters (Fall versus Spring), the same might hold true at the weekly level; that is, there might be a positive association between the number of hours per week children attend preschool and their ability to successfully engage their peers in positive interactions. It is interesting to note, however, that the children in Wright's study attended school for only 2.5 hours per day (i.e., 12.5 hours per week); a stronger effect could be evidenced in children who spend substantially more hours per week in preschool.

Social Competence: Relations with Adult Presence and other Site

Characteristics

Although there are benefits to high teacher-student ratios in preschools (e.g., less hostility among peers and more successful on tasks; Hauser-Cram, Bronson, & Upshur, 1993), there are also implications in terms of children's play partners—with high teacher-child ratios, children are more likely to engage with adults than peers (Hauser-Cram et al., 1993). A positive association also was observed between being within a parent's reach and staring at an unfamiliar peer, particularly in the case of inhibited children (Kagan et al., 1998). Having high

teacher-child ratios, thus, might result in less time spent in social play with peers as well as less reticent behavior.

In addition to adult presence, other classroom and institutional characteristics variables that appear relevant to children's play and peer interactions are the quality of teacher-child relationship, the teachers' sociodemographic characteristics (e.g., ethnicity and whether it matches the students' ethnicity, as well as gender), curriculum and pedagogical philosophy, and size of the student body. Closer and less conflictual teacher-child relationships have been associated with lower aggression, victimization, and anxious-withdrawn behavior (Howes et al., 2011). Having more female teachers has been associated with lower aggression in schools (Le & Stockdale, 2011), whereas higher levels of aggression in classrooms has been associated with larger peer groups (Howes et al., 2011) and larger schools (i.e., having a larger student body; Le & Stockdale, 2011; Thomas, Bierman, & the Conduct Problems Prevention Research Group, 2006). If larger schools have lower teacher-child ratios, these findings accord with the findings that higher teacher-student ratios are associated with less aggression. Classrooms offering a greater variety of activities from which students could choose were associated with more peer interaction, as well as greater focus and persistence (i.e., so relevant to both children's EC and social competence; Hauser-Cram et al., 1993). Some evidence suggests, however, that the impact of class- and school-level characteristics might differ by age. For example, Gubbels et al. (2011) found that characteristics of the physical and social space (i.e., adult presence and group size) were related to the

intensity of children's physical activity during play for 2 year olds but not 3 year olds. Accordingly, it might be not merely adult presence, but this larger set of site-level characteristics that influence the quality and nature children's social interactions.

Peer Context

Peer relationships influence children's development through the activities in which they engage, the norms on which they are based, and the opportunities they offer for skill development, as well as a social context for understanding themselves in relation to their peers, serving as a source of approval or rejection (Chen & French, 2008; Hartup, 1995). Group norms and the quality of interpersonal interactions can serve to shape or scaffold the behavior of the individual members. Epley, Caruso, and Bazerman (2006), for instance, found evidence that group-level norms and practices influenced the outcomes of perspective taking: In competitive groups defined by divergent interests and goals, perspective taking was associated with increased egoism, but with less egoistic behavior in cooperative groups with common interests and goals. Similarly, comparing students at traditional and democratic high schools, Higgins, Power, and Kohlberg (1984) found that the students in the democratic schools demonstrated higher levels of moral reasoning, responsibility, and judgment. The authors attributed these differences to the formulation of collective norms that arose from explicit discussion that, in turn, enabled the members to reason, both individually and collectively, at higher levels than would have been achieved in a peer context that did not share these characteristics.

Relations between Children's EC and Peer Context

More directly related to the research project proposed herein, Fabes, Martin, Hanish, Anders, and Madden-Derdich (2003) argued that whereas children's own levels of EC might influence with which peers they most frequently interact, children's peer groups subsequently influenced their use of regulatory strategies. They posited that children who associate with well-regulated peers are more likely to learn and successfully employ regulation strategies themselves. Moreover, they argued that play that excites strong emotions (e.g., rough and tumble play) would encourage the development of regulation strategies in order to enable the maintenance of play. Fabes, Martin, et al. recognized, however, that children's responses to such play also would be moderated by their own capacity for EC.

The Moderating Role of Peer Context

Group-level characteristics have been shown to interact with individuals' characteristics in predicting their behavior; although much of this research involves adolescents and problem behavior, it demonstrates the potential of peer contexts to serve as moderators for their members' behavior. For instance, peers' smoking/drinking behavior had an exacerbating (i.e., magnifying) effect on the positive relations between peers' high risk-taking tendency and an individual's risk-taking behavior (e.g., higher-intensity poly-drug use). Analogous relations also held in analyses involving individuals' low refusal assertiveness and poor decision-making skills (Epstein, Bang, & Botvin, 2007). Peer alcohol use was similarly found to moderate the relation between genetic risk and adolescent

drinking; having peers with high alcohol use, rather than low alcohol use, exacerbated the positive relation between genetic risk and alcohol use (Guo, Elder, Cai, & Hamilton, 2009).

Moderated relations also have been observed for positive peer characteristics. Friendship quality, as an example, can serve as a buffer: Strong friendship support dampened the significant positive relation between uncontrollable life events and sexual risk-taking in a sample of adolescents (Brady, Dolcini, Harper, & Pollack, 2009). In analyses involving older children and adolescents, the group's level of achievement moderated the relations between the individuals' academic performance and social competence two years later. In particular, individuals in a high achievement group evidenced a significant positive relation, whereas individuals in a low achievement group evidenced a nonsignificant relation (Chen, Chang, Liu, & He, 2008; see also Chen et al., 2003).

Much like the research involving problem behavior in adolescents, aggression in children's peer context was found to moderate the positive relation between children's genetic contributions and aggressive behavior. In van Lier et al. (2007), high-aggression peer contexts strengthened the positive association between genetic risk for aggression and aggressive behavior, whereas less-aggressive peer contexts had a substantially weaker impact on the relation. Thus, research examining the role of peers' aggressive behavior in childhood parallels the findings obtained with adolescents.

An interaction between individual-level and group-level characteristics in determining outcomes has been evidenced specifically in relation to EC. Fabes, Martin, et al. (2003) found that children's EC (i.e., inhibitory and attentional control) moderated the relations between same-sex peer play and teacher-assessed social competence (i.e., appropriate behavior toward peers) in preschoolers, although for boys only. In particular, having high EC in same-sex peer groups was positively related to social competence, but the reverse was true for boys with low EC; the slope for boys with moderate EC was nonsignificant. Children's EC did not moderate the relation between same-sex play and social competence for girls. EC also was found to moderate the relations between same-sex play and academic competence (both boys and girls, with a different pattern of results obtained for each sex), as well as same-sex play and perceptual-motor competence (girls only).

The literature also provides evidence of the moderating effect of children's peers' characteristics on the relation between shyness and its outcomes. The relation between anxious solitude (i.e., shyness) and social approach/avoidance (i.e., reticent) behavior was magnified by peer exclusion in grades 5 to 6 students (Gazelle & Rudolph, 2004; see also Gazelle & Ladd, 2003). The relation between anxious solitude and peer exclusion, in turn, was moderated by the valence of classroom context in grade 1: a negative classroom climate strengthened the positive relation, even after controlling for attention problems and aggression, whereas a positive climate diminished it (Gazelle, 2006, for boys only). For girls in that study, classroom climate moderated the relations of anxious solitude with

peer victimization and depression; once again, a negative climate strengthened the positive relations and a positive climate dampened it (Gazelle, 2006).

Researchers studying slightly older students (grades 3 to 5) similarly found that positive class climates weakened the relation between anxious solitude and peer exclusion; they did not find, however, that negative climates exacerbated the relation (Spangler Avant, Gazelle, & Faldowski, 2011). Considered together, these studies illustrate how peers' characteristics can exacerbate children's shyness.

Rationale for Current Study

The characteristics of children's peer contexts were proposed to moderate the relations between children's EC and their social behavior within those peer contexts, as well as the relations between children's shyness and their reticent behavior. Five aspects of children's peer contexts were considered—namely peers' EC, anger, sadness, aggression, and positive peer orientation—to represent both positive and potentially deleterious aspects of children's peer contexts. Control variables were included to account for variation due to children's age, gender, and verbal ability, as well as preschool variables (i.e., either adult presence or dummy codes to represent the three different sites).

EC Models

As noted above, a positive relation has been established between children's EC and their social competence. There is evidence, however, that children's EC and peer characteristics (i.e., gender of group's members in relation to child's own gender) can interact to predict children's social and academic

competence (see Fabes, Martin, et al., 2003). The following analyses extend this literature by examining the moderating role of five additional characteristics of children's peers.

Peer contexts with high levels of EC and positive peer orientation were expected to scaffold higher levels of social competence amongst all the group's members so as to render EC less predictive of children's functioning in that context. Accordingly, the slopes between EC and social competence were expected to be weakest in high-EC peer contexts. Peer contexts with low and moderate levels of these characteristics were not expected to afford such scaffolding and, as such, to evidence lower scores and a stronger positive relation between EC and social competence.

In contrast, peer contexts high in negative characteristics (i.e., anger, sadness, and aggression) were expected to engender dysregulation in the children, correspondingly lowering their social competence scores. Such contexts also would serve to strengthen the relation between children's EC and social competence. This construal builds on the notion of self-regulation as a limited resource that can be depleted (e.g., Muraven & Baumeister, 2000; Muraven, Tice, & Baumeister 1998; Vohs et al., 2008), particularly when its use is externally motivated (e.g., by the conditions or another person; Muraven, Gagné, & Rosman, 2008). Dysregulated environments (e.g., low peer EC, high peer anger, high peer sadness, or high peer aggression) that are enduring might draw too heavily on children's self-regulation resources, depleting them and engendering their own dysregulated behavior. This effect would be expected to be pronounced in

children with low EC, whose resources would not only be depleted more quickly, but perhaps at a disproportionate rate compared to children with higher levels of EC. As a consequence, although all children would evidence poorer social competence in a dysregulated context, the positive relation between EC and social competence would become pronounced in these contexts. The same would hold true, albeit to a lesser degree, for peer contexts with moderate levels of these characteristics. Peer contexts with low levels of anger, sadness, and aggression, in turn, would evidence the highest scores across children, but the weakest positive relation between EC and social competence.

Shy Models

Although social withdrawal is a behavioral pattern associated with shyness, characteristics of the social environment might serve to either mitigate or exacerbate this proclivity. Peers' EC, when high (i.e., if they are well regulated), might create emotionally safe environments sufficient for shy children to evidence less withdrawal, perhaps replacing reticent behavior with parallel play; however, when low (i.e., peers are highly dysregulated), the peer context could exacerbate shy children's tendency to withdraw. In an article examining the need for natural space for healthy development, G. W. Evans (2006) argued that "social withdrawal might reflect coping with too much unwanted social interaction" (p. 429). In the context of shy children's proclivity to engage in social withdrawal, theirs might not be withdrawal from peers per se, but withdrawal from interactions that are discomfiting due to the presence of dysregulated behavior or perceived threat.

The potential of threat is more obvious in the case of peers' aggressive or angry behavior. Given their sensitivity to threat and a proclivity to withdraw in response, shy children in a peer context characterized by aggression or anger might engage in reticent behavior, as Coplan and Rubin (1998) suggested, to cope with potential threats that lay in wait in their social environment. Peers' sadness might similarly serve as a marker of potential threats in their shared social environment; a crying peer, presumably, is crying about something that happened in that environment. Thus, aggression or negative affect in the peer context, particularly when such conditions are persistent, could be perceived as a threat and promote social withdrawal in shy children. Such results would be in keeping with past research; Flannery, Wester, and Singer (2004) found that experiencing violence at school, either as a victim or a witness, was significantly positively related to children evidencing anxiety, anger, depression, and other symptoms of trauma and distress in both males and females, and in both elementary and high school students.

Positive peer characteristics such as helpfulness, peer-oriented play, and popularity might be expected to enable shy children to overcome their social reticence and engage socially with their peers. However, highly social environments might prove aversive to shy children. Peers who are extraordinarily solicitous and gregarious might provide unwanted attention and be overstimulating. Additionally, given shy children's fear of negative evaluation, peers in tightly-knit groups might prove too intimidating to approach. This notion certainly would be in line with the findings that shy children are significantly less

likely to initiate social interactions, all the more so had they been rebuffed or, as Gazelle's (2006) findings suggested, victimized previously by peers. In more moderate measure, positive social environments were expected to reduce reticent behavior rather than increase it as in the case with highly social peer contexts.

Measuring Peer Context

Broadly speaking, the term *peer context* refers to a social environment comprised of persons of relatively equal standing. Attempting to define the term more precisely, however, serves only to highlight the many dimensions along which peer context might be characterized. For example, peer contexts might be delineated on the basis of gender (i.e., same-, opposite-, and mixed-sex groupings; e.g., Velásquez, Santo, Saldarriaga, López, & Bukowski, 2010), familiarity and affinity (e.g., friendships, acquaintances, classmates, cliques, and previously unacquainted individuals), or the members' characteristics (e.g., participation in extracurricular or delinquent activities; e.g., Boislard P., Poulin, Kiesner, & Dishion, 2009; Dishion, Spracklen, Andrews, & Patterson, 1996; Gardner, Roth, & Brooks-Gunn, 2009; Snyder et al., 2005).

Peer context is typically defined in terms of children's cliques, classrooms, schools, or affiliative networks. For the purposes of these analyses, a non-canonical approach was taken; peer context was defined in terms of the three classmates with whom a child most frequently interacted, irrespective of the quality of those interactions. To allow for individual differences in play styles (i.e., some children consistently interacted with fewer classmates than did their peers), peer contexts with fewer members (i.e., two peers) were allowed.

Operationalizing peer context in this manner (i.e., on the basis of a limited number of peers with whom children most frequently interacted) had the added benefit of minimizing nesting within classes given that the particular composition of most children's peer contexts were unique to them.

As the objective herein was to reflect children's naturally occurring peer interactions rather than to identify affiliative networks, peer contexts included members with whom a child engaged, regardless of the valence of those interactions. Accordingly, children's peer contexts potentially included peers with whom the children typically had unpleasant or hostile interactions, as well as those with whom they enjoyed pleasant relations; for some, all three peer relationships might have been more representative of antipathy than friendship. In identifying peer contexts, the quality of these relations was not assessed. Rather, the primary goal was to identify the classmates with whom each participant most frequently interacted; the characteristics of those peers were assessed independently.

In terms of assessing the nature of those peer contexts, the characteristics of interest included the peers' level of EC, sadness, anger, aggressive behavior (i.e., externalizing), and positive peer behavior (i.e., positive orientation toward peers). To quantify these five aspects of peer context, each peer was first assessed and scored separately, and then the peer context score was calculated as the average of its members' scores on the variable of interest.

Hypotheses

The overarching hypothesis was that children's behavior in a given social environment is the product of the interaction between their own characteristics and the characteristics of the peer context (i.e., operationalized herein as the three children with whom they most frequently interacted) in which they are situated. In investigating these hypotheses, the contributions of peer context were explored in relation to two aspects of children's characteristics: (a) in the EC models, children's own EC and its relation to their social competence in preschool, and (b) in the shy models, children's shyness and its relation to reticent behavior in preschool. The hypothesized moderated effects were thus tested as two separate series (i.e., the EC models and the shy models), each of which consisted of a set of five models representing different aspects of peer context (i.e., EC, anger, sadness, aggression, and positive peer behavior in children's peer contexts) expected to serve as moderators.

EC1. Moderation by Peers' Effortful Control (Peer Context EC)

In Figure 1, both children's own EC and the EC of up to three peers identified as constituting their peer contexts (peer context EC) predict children's social competence in that social environment, as does the interaction between the two independent variables; the signs above each regression line indicate the predicted valence of the regression term. As evidenced in Figure 2a, an ordinal, linear-by-linear interaction was expected; the regression lines were expected to evidence symmetric fanning, with the greatest dispersion amongst the regression lines at the low end of the EC axis. High peer context EC was expected to

support the highest functioning of all children; as such, children in the high-EC peer context were expected to evidence the highest scores (regardless of their EC scores) but the weakest positive relations (slope) between EC and social competence. Moderate peer context EC was expected to evidence a positive relation between EC and social competence, with a stronger slope given that moderate peer context EC would not provide as much scaffolding as high peer context EC. Low peer context EC, in turn, was expected to evidence the lowest social competence scores but the strongest relation between EC and social competence.

EC2, EC3. Moderation by Peers' Negative Affect (Peer Context Anger, Peer Context Sadness)

The relation between children's own EC and their social competence also was expected to be moderated by their peers' negative affect, which was measured in terms of their anger (Figure 3) and, separately, their sadness (Figure 4). An ordinal, linear-by-linear interaction was expected, with the strongest positive slope associated with high peer context anger or sadness, respectively (Figure 2b). Children in a peer context characterized by persistent or acute negative affect (i.e., angry and sad, respectively) were expected to evidence relatively low social competence and the strongest relation between EC and social competence. Peer contexts with low negative affect, in turn, were expected to have the least dysregulating effect on its members and, as such, children in these contexts were expected to have the highest social competence scores but the weakest relation between EC and social competence. The slope and scores

associated with peer contexts with moderate levels of negative affect were expected to fall between the values associated with high and low levels of negative affect.

**EC4. Moderation by Peer Contexts Characterized by Aggressive Behavior
(Peer Context Aggression)**

Similarly, peer context aggression (measured in terms of externalizing behavior) was expected to moderate the positive relation between children's EC and social competence (Figure 5). Here, again, children in high-aggressive peer contexts were expected to evidence the lowest scores, but the strongest positive relation between EC and social competence (Figure 2b). Children in low-aggressive peer contexts, in turn, were expected to evidence the highest social competence scores but the weakest positive relation between EC and social competence. The values of children in moderate-aggressive peer contexts were expected to fall between those associated with low- and high-aggressive peer contexts.

**EC5. Moderation by Peer Contexts Characterized by Positive Peer Behavior
(Positive Peer Context)**

The hypothesized moderating effect of positive peer context (i.e., helpfulness, laughter/smiling, and popularity) on the positive relation between children's EC and their social behavior is depicted in Figure 6, and the plot of the hypothesized simple regression lines is provided as Figure 2a. The positive relation between EC and social competence was expected to be the weakest for children in high positive peer contexts; children in these contexts were expected

to do relatively well (regardless of their level of EC) and, thus, have the highest social competence scores overall. Low positive peer contexts were expected to evidence the lowest social competence scores but the strongest positive relation between EC and social competence.

Shy1. Moderation by Peer Context EC

In Figure 7, children's observed reticent behavior (i.e., observed onlooking and unoccupied play) is regressed on children's shyness, their peer context EC, and the interaction between the two; the associated plot is depicted in Figure 2d. High peer context EC was expected to support positive peer interactions amongst its members and reduce the amount of reticent play observed overall; as such, this condition was expected to have the weakest positive relation between shyness and reticent behavior, and the lowest proportions of reticent behavior. Children in low-EC peer contexts were expected to evidence a higher proportion of reticent behavior than children in moderately- or well-regulated peer contexts, but the strongest positive relation (slope) between shyness and reticence; accordingly, more reticent behavior was expected overall in this condition, and shyness was expected to be less predictive of the proportion of reticent behavior evidenced. The values for moderate-EC peer contexts were expected to lie in between those of high- and low-EC peer contexts.

Shy2, Shy3. Moderation by Peer Context Anger and Peer Context Sadness

Peer context anger was expected to exacerbate the positive relation between children's shyness and their engagement in reticent behavior (Figure 8; see also Figure 2c). Children in a peer context characterized by persistent or

acute anger were expected to exhibit a greater proportion of reticent behavior relative to their counterparts in peer contexts low or moderate in anger, and to evidence a stronger positive relation (slope) between shyness and reticence. In contrast, children in low-anger peer contexts were expected to evidence lower levels of reticent behavior than their counterparts in peer contexts with high and moderate levels of anger, but the weakest positive relation between shyness and reticence.

Peer context sadness was expected to moderate the relation between children's shyness and reticent behavior in the same manner as anger (Figure 9; see also Figure 2c).

Shy4. Moderation by Peer Context Aggression

Similarly, the prevalence of aggressive behavior in the peer context was expected to moderate the positive relation anticipated between children's shyness and observed reticent behavior (Figure 10; see also Figure 2c). Peer contexts high in aggressive behavior were expected to engender greater reticent behavior in all children; as such, this condition was expected to evidence higher levels of reticent behavior than in the other two peer context conditions and a stronger relation between shyness and reticent behavior. On the other hand, peer contexts low in aggressive behavior were expected to evidence the lowest reticent behavior overall and the weakest positive relation between shyness and reticence was expected in this condition.

Shy5. Moderation by Positive Peer Context

Positive peer context (i.e., peers' laughter/smiling, helpfulness, and popularity) was expected to moderate the positive relation between shyness and observed reticence, evidencing a quadratic effect (Figure 11; see also Figure 2e). Children in moderate positive peer contexts were expected to evidence the lowest levels of reticent behavior relative to their counterparts in peer context with high and low levels of positive peer behavior, but the weakest positive relation between shyness and reticent behavior. In contrast, children in high positive peer contexts (i.e., peers who were engaged in exuberant play with peers, highly solicitous, and very popular) or low positive peer contexts (i.e., engaged in little peer-oriented play, not helpful, and with low peer preference scores) were expected to evidence greater proportions of reticent behavior than their counterparts in moderate peer contexts, and a stronger positive relation between shyness and reticent behavior. Children in high positive peer contexts were expected to evidence the highest reticent behavior overall and to have the strongest relation between shyness and reticent behavior.

Methods

Participants

The participants consisted of a convenience sample of children who attended one of three preschools serving faculty, students, and the community at large on a southwestern university campus. The three preschools differed with respect to their teacher-child ratios, curriculum, schedules, and attendance options (i.e., two were full-day preschools that offered both full- and part-time options,

whereas the third preschool offered only part-time options). The amount of time participants spent with their classmates ranged from 7.5 to 37.5 hours per week.

Three different levels of participation were available: (a) full participation; (b) sociometrics only, which involved both rating other children's photographs and being rated by the other participating children; and (c) sociometric photos only, which involved only being rated and not rating other children. In the first semester of data collection (intake 1), parental permission was obtained for 102 children (40 girls), as well as 5 more (2 girls) who had permission only for the sociometric tasks and another 5 (4 girls) for sociometrics photographs only, across the three different preschools. Parental permission was obtained for an additional 5 children (1 girl); however, given that the children in this class were relatively young 3-year-olds and that only 50% of the class had parental permission, data were not collected from this class. To increase sample size, parental permission was sought for the children who joined two of the initial three preschools the following year (intake 2; $n = 40$ for full participation, 16 girls; 3 for sociometrics only, 2 girls; and 4 for sociometrics photographs only, 3 girls). Parental permission was thus obtained for 142 children for full participation, 8 children for sociometrics only, and 9 for sociometrics photographs only, not including the class that was dropped at the first intake.

Exclusion criteria were minimal. To participate, the children had to be at least 3 years old, able to understand the tasks (i.e., children whose developmental delays precluded meaningful participation or who spoke neither English nor Spanish were not included; the experimenters ascertained this by speaking with

teachers or parents), and in attendance at the preschool for at least half of the observation period (i.e., this excluded any children who attended only briefly or joined the preschool late in the semester). For those children for whom full parental permission was obtained, six children were not included in the final dataset: two children were too young, three were unable to understand the tasks, and one left the preschool early in the semester. Further, four children were excluded from these analyses to eliminate un-modeled dependencies introduced by the presence of siblings in the dataset: two of the children were a pair of twins and two were the younger siblings of other children in the study.

Sociodemographics. The resulting analytic sample consisted of a total of 132 preschoolers (54 females). The children's ages, calculated at the middle of their respective semesters, ranged from 37 to 70 months of age ($M = 51.95$, $SD = 7.73$). Sociodemographic data was obtained through parent questionnaires ($n = 103$; 86 mothers, 17 fathers): 57% ($n = 63$) were Caucasian, non-Hispanic; 14% ($n = 19$), Hispanic; 6% ($n = 8$) of Asian or Pacific Islander origin; 2% ($n = 2$) African American; 2% ($n = 3$), Native American; 6% ($n = 8$), mixed or other ethnicity; and 22% ($n = 29$), unknown.

The participants' annual family income was predominantly high: 32% reported an annual income over \$100K, 9% reported \$75-\$100K, 9% reported \$60-\$75K, 6% reported \$45-\$60K, 8% reported \$30-\$45K, 6% reported \$15-30K, and 4% reported income under \$15K (no income data for 26%). Parental education was also relatively high: No mothers and 2% of fathers had less than a high school degree; 1% and 5%, respectively, were high school graduates with no

further education; 16% and 11% had some college or a two-year diploma; 25% and 27% were college graduates; 17% and 14% had master's degrees; and 18% and 17% had attained a PhD, JD, or MD (no education data were obtained for 23% of mothers and 24% of fathers).

Missingness. The sources of missingness included failure to submit questionnaires, experimenter error, and children who left the preschool or withheld assent. Missingness was coded as a dichotomous variable (0 = *present*, 1 = *missing*). Missingness was coded first in terms of each measure (i.e., whether it was missing) and then at the construct level (i.e., whether the children had any of the measures that loaded onto the construct). The associations between missingness and children's scores on the predictor and control variables were tested. Missingness at the item level was rare; average scale scores were computed based on the number of answered items.

At the latent construct level, most participants had at least one source of data; few participants were missing all relevant indicators. Only 2 to 3 children were missing all of the measures for any one construct, and all children had at least some data for the social competence construct. One child was missing 7 out of 9 constructs used in these analyses due to experimenter error, and another child was missing 5 out of 9 constructs because the child participated at intake 2 and was in a class with children who participated at intake 1 (i.e., so no peer context data were collected for this child's peers at intake 2). A third child was missing 2 of 9 constructs; otherwise, children were missing one or fewer constructs used in

these analyses. Given that very few children were missing data at the construct level, no missingness analyses were conducted for constructs.

At the measure level, most participants had naturalistic observations, observer questionnaires, and teacher questionnaires; the greatest missingness was evident for variables derived from parent questionnaires and the laboratory tasks measuring EC. Missingness on the two predictors derived from parent questionnaires (i.e., EC and shyness) was significantly ($ps < .05$) positively associated with teachers' ratings of EC, lab EC, age, and peer ratings of liking, but only marginally with observed peer-oriented and reticent behavior, and not with teacher's ratings of popularity nor children's gender. Verbal ability was marginally positively related only to missingness of parents' ratings of shyness and not EC. Missingness on lab EC (i.e., participation in the laboratory tasks) was significantly positively associated with age, verbal ability, parents' and teachers' ratings of EC, teachers' and peers' ratings of popularity and liking, and teachers' ratings of shyness, but not gender nor observed peer-oriented and reticent behavior. However, as all constructs were derived from multiple sources, nearly all of the children who were missing parent reports of EC, parent-rated shyness, or lab EC still had other sources of data for the EC and shyness constructs.

Procedures

Upon receiving approval from the institutional review board and, subsequently, the preschool directors, parental permission forms were distributed describing the measures, duly informing parents of the potential risks and

benefits, and offering a choice of full, limited (sociometrics only, either as participants or photographs only), and no participation (at intake 1, parental permission was sought in 9 classes; at intake 2, in 4 classes). Where parental permission was granted, children were asked to provide verbal assent for each laboratory/classroom assessment. In age-appropriate language, children were assured of the confidentiality of their responses and advised that they could withdraw assent at any point without reprisal. In addition, as part of registration at their respective preschools, all parents granted permission for the unobtrusive observation of their children.

The classroom and laboratory assessments utilized in these analyses were typically conducted in three sessions of 20 to 30 minutes and, with few exceptions, in an invariant order. Additional sessions were occasionally required when children asked to continue another day, in the case of equipment problems, due to parents arriving early to pick up their child, and to accommodate class activities. The laboratory assessments were conducted by 21 trained research assistants (13 females) in either English or Spanish ($n = 1$; translated into Spanish by a native speaker of the language). Assessments of children's receptive language (session 1, typically in a corner of the child's classroom) and EC (session 2, in a separate room in the same building as the preschool; each child received a small finger puppet as part of one task) were conducted first (at intake 1, February to April; at intake 2, October to November). Sociometric data were collected in the Spring as recommended by Pellegrini et al. (2007) at both intakes (at intake 1, March 18 to May 1, as part of the second session; at intake 2,

February 11 to April 7, in a separate session). With additional parental permission, children participated in another session involving two computerized testing procedures (intake 1, $n = 86$; intake 2, $n = 23$). As part of this session, children were given a choice of small toys as a reward.

The parent, teacher, and observer questionnaires were distributed in the last month of data collection at both intakes; all questionnaires were written in English. The teachers who spent the greatest amount of time with the preschoolers were asked to complete the questionnaire; when two teachers spent equal time with their students, the questionnaires were split evenly and randomly between them. Teachers were paid \$10 for every child for whom they completed a questionnaire. Questionnaires were distributed to the parents of all participants; parents were offered the opportunity to receive \$10 for each questionnaire or to assign those funds to the preschool. Observers completed questionnaires for all children they observed on a number of occasions and knew well enough to rate; as a consequence, the number of observer questionnaires completed per child ranged from 1 to 8 ($M = 3.38$, $SD = 1.44$, mode = 3); 14 of 132 children had only 1 observer questionnaire completed, and 15 had 5 or more observer questionnaires. For children with multiple observer questionnaires, the responses were averaged at the item level and composite scores were created from these values. Observer questionnaires were obtained for participants and, for the purposes of assessing peer context characteristics only, non-participants. Observers did not receive any financial remuneration; rather, they received course credits for observing the children and completing questionnaires.

Following a 4-week training period, naturalistic observations were conducted daily over 3 months (28,765 observations from February to May at intake 1; 14,130 observations from September to December at intake 2). Observations were collected for both participants and non-participants because parents consented to non-intrusive observations of their children when they registered at their respective preschools; data collected on non-participants were utilized only for testing the moderating effects of the characteristics of peer context. A cadre of 28 trained research assistants (at intake 1, 22 observers, 19 females; at intake 2, 10 observers including 4 returning observers, 8 females) conducted the observations. Most observers were assigned to a single preschool, although some observed at multiple sites.

The children were observed for 3 months to better represent their stable patterns of play behavior (see Fabes, Martin, & Hanish, 2009). Children's play (social, parallel, solitary-constructive, solitary non-constructive, onlooker, unoccupied, and teacher-oriented) was coded during unstructured periods (i.e., free-play time in the classroom and playground), whereas emotions (positive, sad, or angry/frustrated) and aggression were unobtrusively observed during both unstructured and semistructured (e.g., lunch time, when children engaged in a required activity but were free to socialize) periods; observations were not conducted during structured activities (e.g., Spinrad et al., 2004). Observations consisted of a series of 10 s scans (Rubin, Cheah, & Fox, 2001), the order of which was pre-determined by a random list of children's names. In addition, event sampling was used to record aggressive behavior whenever it was observed

due to the limited ability of 10 s scans to capture low frequency events such as aggression (see Fabes et al., 2009).

The number of observations per child thus differed for play observations (range = 34 to 656, $M = 207.21$, $SD = 115.64$), emotion observations (range = 67 to 708, $M = 243.14$, $SD = 148.81$), and aggression observations (range = 58 to 655, $M = 226.71$, $SD = 133.62$). The number of observations per child varied due to differences in attendance (i.e., part-time versus full-time), differences in the frequency and duration of the free-play periods at the three preschools, and child and observer absences. Although there is no consensus on what constitutes an adequate number of observations (see Fabes et al., 2009), a minimum of 60 observations was required to calculate participants' play, emotion, or aggression codes. As a result of not meeting this criterion, observed play scores were coded as missing for 3 children, and for 1 child in the case of observed aggression; all children had at least 60 emotion observation codes.

Reliability coding, conducted solely by the author, occurred throughout both intakes (12.3% of the 42,895 observations collected). Observational data were dropped when an observer's reliabilities were systematically poor. Play data were dropped for three observers at intake 1 and none at intake 2, emotion data were dropped for two observers at intake 1 and none at intake 2, and aggression data were not dropped for any observers at either intake. The dropped data were not included in the totals listed in the previous paragraph.

Measures

The data were collected using a multi-trait, multi-method research design utilizing laboratory assessments; parent, teacher, and observer questionnaires; peer ratings and nominations; and naturalistic observation (all measures utilized in these analyses are appended). Participants' EC was assessed both by parents' and teachers' reports, as well as laboratory tasks; shyness by teacher and parent report; and various aspects of social behavior and outcomes by teachers' reports of popularity, peers' reports of peer liking, and naturalistic observations (peer-oriented play and reticent behavior). The peer context variables were assessed through teacher questionnaires (i.e., EC, aggressive behavior, anger, sadness, and positive affect), parent questionnaires (i.e., EC), observer questionnaires (i.e., externalizing behavior and sadness), peer report (i.e., anger and helpfulness), laboratory assessments (i.e., EC), and naturalistic observation (i.e., anger, sadness, aggression, and peer-oriented play).

Effortful control (EC). Effortful control (EC) was modeled as a latent factor, on which were loaded the teacher and parent reports of EC, as well as the children's average score on four laboratory assessments of self-regulatory behavior. Zero-order correlations amongst these three methods ranged from .37 to .44 ($ps < .001$).

Reported EC. Reported EC was assessed by three subscales of the Child Behavior Questionnaire (CBQ; personal communication to Nancy Eisenberg, 1995; Putnam & Rothbart, 2006, for the short form of the subscales; Rothbart, Ahadi, & Hershey, 1994; Rothbart et al., 2001): attention shifting (10 items, e.g.,

“Can easily shift from one activity to another”; $\alpha = .75$ for parents, $.83$ for teachers), attention focusing (short form, 6 items, e.g., “When building or putting something together, becomes very involved in what s/he’s doing, and works for long periods”; $\alpha = .64$ for parents, $.85$ for teachers), and inhibitory control (short form, 6 items, e.g., “Can wait before entering into new activities if s/he is asked to”; $\alpha = .59$ for parents, $.82$ for teachers). Reported EC also included the activation control subscale developed by Simonds and Rothbart (2004) for middle childhood, which was adapted herein for use with preschoolers (e.g., “do an important task” was substituted for “do homework” and “clean up after an activity” for “clean own room”). Additionally, two items were dropped from both the teacher and parent activation control scale (see Appendix F), and an additional two items were dropped from the teacher scale only; the resulting scales had 13 items for parents and 11 items for teachers (e.g., “Can say hello to a new child in class, even when feeling shy”; $\alpha = .59$ for parents, $.73$ for teachers).

For all four scales, parents ($n = 103$) and teachers ($n = 127$) rated the frequency with which children demonstrated the described behavior using a 7-point response scale (1 = *extremely untrue*, 7 = *extremely true*). Parents were asked to consider the children’s behavior for the previous 6 months, whereas teachers were asked to consider the previous 3 months. The four scales were averaged as per Moriya and Tanno (2008; for parents, $\alpha = .61$ for the four scales but $.81$ for the 34 items; for teachers, $\alpha = .83$ for the four scales but $.92$ for the 32 items), reversing items as appropriate and dropping one item from the attention

shifting subscale (i.e., “Often doesn’t seem to hear me when he/she is working on something,” reverse coded) due to poor internal consistency.

Lab EC. Children were asked to perform four laboratory assessments of self-regulatory behavior (i.e., Bird and Dragon, Gift Wrap, Knock Tap, and Computerized Performance Task; $n = 119$). Included in these data were 5 children with only one of the EC tasks, and another 3 with only two tasks. Each task was videotaped and subsequently coded by trained research assistants. To assess reliability of the coding, two coders independently coded 27% of the recordings. To create a single score for the four laboratory tasks assessing EC ($r_s = .30$ to $.49$, $p_s = .003$ to less than $.001$; $\alpha = .72$), their scores were standardized (i.e., to render them on the same scale) and then averaged.

Bird and Dragon. In Bird and Dragon, a task that assesses both inhibitory and activation control, children were asked to perform commands (e.g., “touch your nose”) issued by a “nice” bird puppet and ignore the similar commands of the “mean” dragon puppet (i.e., representing activation and inhibitory control, respectively; Kochanska et al., 2000; Kochanska, Murray, Jacques, & Koenig, 1996; Reed, Pien, & Rothbart, 1984). Experimenters delivered five bird and seven dragon commands as scripted; the position of the bird puppet (right versus left hand) was randomized. Children’s responses to the bird commands were rated on a 4-point scale (1 = *no movement*, 4 = *full, correct movement*), with the dragon commands scored in the reverse, such that higher scores represented higher EC. Two scores were generated for the task: an inhibitory control score

(i.e., the average response to the dragon commands; ICC = .99) and an activation control score (i.e., the average response to the bird commands; ICC = .99).

It has been argued, however, that behavioral inhibition and activation must be considered in combination to accurately differentiate reactive control from EC (Eisenberg, Eggum, et al. 2010; Sulik et al., 2010) and to evaluate their relations with human functioning (Bjørnebekk, 2009; Carver & White, 1994; Corr, 2002; Muris, Meesters, de Kanter, & Timmerman, 2005). Based solely on children's responses to the dragon commands, which require the suppression of behavior, it is not possible to differentiate behaviorally inhibited children from well-regulated children. Similarly, it is not possible to differentiate between impulsive and well-regulated children solely on the basis of children's responses to the bird commands. By considering both aspects of the tasks in tandem, it is possible to differentiate well-regulated children, who would be expected to score well on both elements, from dysregulated children (i.e., those with behavioral inhibition or impulsive temperaments), who would be expected to score well only on one facet (i.e., dragon and bird commands, respectively). Accordingly, the product of the inhibitory and activation scores, with a theoretical score range of 1 to 16, were calculated; the product scores were divided by four to preserve the 4-point scale.

Continuous Performance Task (CPT). The Continuous Performance Task (CPT) assesses attentional control (Rosvold, Mirsky, Sarason, Bransome, & Beck, 1956) and impulsivity (Halperin, Sharma, Greenblatt, & Schwartz, 1991; Halperin, Wolf, Pascualvaca, & Newcorn, 1988). The CPT program utilized in this study was an adapted version (Sulik et al., 2010), shortened to accommodate

the limited attention spans of young children (as per Halperin et al., 1991). The one-interval program consisted of 30 presentations of the target stimulus (i.e., a fish) and 120 presentations of non-target stimuli (i.e., nine other familiar images, including a butterfly and a flower). The images were presented in random order, with a stimulus duration of 5 s and an interstimulus interval (ISI) of 1.5 s; a 1.5 s ISI has been found to better differentiate between impulsive and controlled responses than an ISI of 1 s (Halperin et al., 1988). The children were seated at a table and the program was run on a laptop computer that was placed on the table. The children were instructed to press a button as fast as possible when the target stimulus appeared, and not push a button when the target stimulus was not present.

The program coded hits (i.e., key pressed when fish presented, a correct response); correct rejections (i.e., abstained when non-fish image presented); errors of commission, or false alarms (i.e., key pressed when non-fish image presented); and errors of omission, or misses (i.e., key not pressed when fish presented). Good split-half reliability was evidenced for both fish and non-fish trials ($r_{yy,s} = .86$ and $.91$, respectively). To calculate the overall task score, detection or d' (d prime), the proportions of hits and false alarms were each standardized and then each participant's standardized false alarm score was subtracted from the standardized hits score (MacMillan & Creelman, 2005). Whereas an inability to discriminate would be represented as a d' of zero, a positive score (i.e., where the hits score is greater than the false alarms score) would be indicative of attentional control. Children with high EC were expected

to have a high number of hits, few to no errors of omission or commission, and few false alarms (so a higher d' relative to children with lower EC); children with inhibited temperaments, in turn, were expected to have fewer hits and so a smaller d' . Thus, larger, positive d' scores were taken as indicative of EC whereas lower d' scores were associated with reactive control.

Gift Wrap. The gift wrap task taps children's ability to delay gratification (Kochanska et al., 2000; Kochanska et al., 1996). Having finished the knock tap and bird and dragon tasks, the children were told that they would be given a prize for doing well. The prize (a finger puppet), however, was not yet wrapped; the children were instructed to look straight ahead and not peek while the experimenter noisily wrapped the gift behind their backs for 60 s. The task score consisted of the latency to first peek in seconds (maximum of 60 s; ICC = .94), latency to first turning the body around (maximum of 60 s; ICC = .90), and overall strategy (1 = *child turns around to peek and does not fully return to forward position* to 5 = *child does not try to peek*; ICC = .81). The three scores ($r_s = .48$ to $.82$, $p_s < .001$) were standardized and then averaged to create a single gift wrap score.

Knock Tap. The knock tap task assesses the ability to inhibit a prepotent response based on a learned rule; it involved knocking with a closed fist or tapping with an open hand on the table, and consisted of two phases (i.e., an imitation condition and a switch condition; Perner & Lang, 2000). After warming up with knocks and taps to ensure the participant understood the task, the experimenter asked the child to imitate his or her actions, which consisted of an

invariant order of 8 knocks and taps. In preparation for the switch condition, the experimenter asked the child to knock when the experimenter tapped and to tap when the experimenter knocked. Practice trials were conducted to ensure the children understood the task and then the experimenter proceeded with the 8 reverse-condition trials of knocks and taps, also delivered in an invariant order. The task score was calculated as the proportion of correct responses during the reverse condition, with a higher score indicative of greater EC (Cohen's $K = .89$).

Social competence. Children's social competence was modeled as a latent factor indicated by teachers' reports of popularity, observed peer-oriented play behavior, and peers' reports of child liking (*rs* amongst these measures were .26 to .43, *ps* = .007 to less than .001).

Peer-oriented play behavior. Children's peer interactions were coded using a modified version of the Play Observation Scale (Rubin et al., 2001; Rubin & Coplan, 2004). Play behavior was coded as a component of the 10 s scans during unstructured play periods. Peer-oriented play ($K = .80$ at intake 1, $.79$ at intake 2) consisted of both social (i.e., engaged in a cooperative or shared activity with other children) and parallel (i.e., engaged in a similar activity in the proximity of other children) play. Children's scores on this variable consisted of the proportion of observed play behavior that was coded as social or parallel, with higher scores indicative of more peer-oriented play.

Peer ratings of liking. In one-on-one interviews, participants were asked to rate how much they enjoyed playing with each participating classmate, first identifying the classmate in the photograph and then rating using a three-face

response scale (i.e., a smiling face, “a lot,” coded 3; a neutral face, “sometimes,” coded 2; and a frowning face, “only a little bit,” coded 1; see Asher et al., 1979). The ratings were averaged and then standardized within class, with higher positive scores indicating that peers enjoyed playing with that child.

Popularity. Using a 4-point scale (1 = *really false*, 4 = *really true*), teachers rated children’s popularity using three items from an adapted version of the Perceived Competence Scale for Children (Harter, 1982; $n = 127$, $\alpha = .90$). The popularity score was calculated as the average of these items (e.g., “This child is popular with others his/her age”), with a higher score indicative of greater popularity.

Shyness. Shyness was modeled as a latent construct indicated by teachers’ reports and parents’ reports. Parents and teachers assessed children’s shyness using the short version of the CBQ subscale (Putnam & Rothbart, 2006; 6 items, e.g., “is sometimes shy even around people s/he has known a long time”; for parents, $n = 103$, $\alpha = .84$; for teachers, $n = 127$, $\alpha = .85$; $r = .37$, $p < .001$) using a 7-point response scale (1 = *extremely untrue*, 7 = *extremely true*). The score for each subscale was computed as the items’ average (reversing items as appropriate), with higher scores indicating greater shyness.

Reticent behavior. As noted above, a modified version of the Play Observation Scale (Rubin et al., 2001; Rubin & Coplan, 2004) was used to code children’s play behavior during unstructured periods. Play codes included onlooking (i.e., observing other children playing but not participating) and unoccupied (i.e., engaged in aimless, unfocused behavior) behavior. Onlooking

and unoccupied behavior combined ($K = .71$ at intake 1, $.66$ at intake 2) represented observed social reticence (see Coplan et al., 2001; Coplan et al., 1994; Parten, 1932; Rubin, 1982; Rubin & Coplan, 2004; Spinrad et al., 2004). Reticent behavior was scored as the proportion of observed play behavior that was coded as onlooking or unoccupied, with higher values indicating a greater proportion of reticent behavior during free-play periods.

Peer context. Children's peer contexts consisted of the up to three classmates with whom they were reported to most frequently interact. To ascertain the identity of these peers, teachers and observers were provided with a class list and asked to identify up to 5 classmates with whom each participant most frequently interacted. Teachers and observers were advised that the relationships with the children's peers could be harmonious or conflictual, as well as reciprocated or unreciprocated.

Obtaining teacher and multiple observer reports generated a number of potential members for each child's peer context, with some overlap and some differences. To identify the members of each child's peer context, a number of decision rules were instituted. First, peers with the greatest amount of overlap were selected, giving preference to those who occurred earlier in each list, were nominated by the teacher, and were participants rather than non-participants. When there were few raters and no overlap, additional evidence of the relationship between a child and the peers identified by the teacher or observer was sought (e.g., whether the child was listed as a peer context member on the peer's list of peers). When reporters consistently included few peers on their lists

for a particular child, or when there were many reporters but overlap only on two peers, then only two peers were selected as members of that child's peer context ($n = 21$). No participants had peer contexts with only one peer. Two participants did not have any peer data: one due to error, and the other, a participant at intake 2, because that child's classmates had participated at intake 1, so no peer data were collected for that child. Fewer than 7% of the peers selected for a child's peer context were non-participants; in these cases, their data were based solely on observation scores and observer questionnaires.

The characteristics of the peer context (i.e., peer context EC, sadness, anger, aggressive behavior, and positive peer behavior, each tested separately) were assessed through teacher, parent, and observer questionnaires, peer nominations, laboratory assessments, and naturalistic observations. Each aspect of peer context was represented as a latent factor indicated by two or three manifest variables, which were derived from at least two sources. The manifest variables loading on the peer context constructs were calculated as the average of its members' scores on the measure of interest. Parent, teacher, peer, and laboratory data were available only for peers who were also study participants; data for peers who were non-participants were derived solely from naturalistic observation and observer questionnaires.

Peer context EC. Peers' EC was modeled in the same manner as the participants'—as a latent factor indicated by parents' reports of EC, teachers' reports of EC, and lab EC. Parents' and teachers' reports were calculated, each consisting of the mean of the attention shifting, attention focusing, inhibitory

control, and activation control subscales described above; a separate composite score was calculated for parents and for teachers. Lab EC consisted of the average score on the four laboratory tasks (conducted, scored, and standardized as described above). For each peer, the questionnaire and observed task scores were calculated as described above, and then the scores for the three (or fewer) peers were averaged to form a composite teacher-reported EC score for the peers, a separate parent EC questionnaire score (i.e., with parents rating only their own child), and an average observed laboratory task score (i.e., for each child, standardizing and then averaging scores across the four EC tasks). The three average peer scores were modestly to moderately associated ($r_s = .33$ to $.49$, $p_s < .001$).

Peer context anger. The latent factor representing peers' anger was assessed through peers' average peer nominations and teachers' and observers' reports of anger/frustration ($r_s = .25$ to $.45$, $p_s = .004$ to less than $.001$). Teachers ($n = 129$) rated participants' anger/frustration on six items (e.g., "gets angry when s/he can't find something s/he wants to play with"; CBQ short form, Putnam & Rothbart, 2006; $\alpha = .84$) using a 7-point response scale (1 = *extremely untrue*, 7 = *extremely true*). Observers also completed the anger/frustration subscale ($n = 129$, $\alpha = .93$). As part of the sociometrics task, children nominated classmates who best exemplified three behavioral descriptors, one of which was "argues or gets mad the most." Using an array of photographs of participating classmates, participants were asked to identify the classmates who most, second most, and third most—scored 3, 2, and 1, respectively—exemplified the descriptor. The

average nomination for each child rated was calculated, and then the scores were standardized within classroom. Sociometric scores were calculated only where at least 50% of the class completed the tasks ($n = 113$). Naturalistic observations of anger were not used because reliability was low, in part due to the low frequency of anger/frustration observations (as predicted by Fabes et al., 2009).

Peer context sadness. Peers' average sadness was assessed through teacher questionnaires, observer questionnaires, and naturalistic observation ($r_s = .22$ to $.43$, $p_s = .01$ to less than $.001$). Teachers rated participants' sadness (7 items, e.g., "tends to become sad if plans—for a special event or activity—don't work out"; CBQ short form, Putnam & Rothbart, 2006; $\alpha = .70$, $n = 129$). Observers rated the children using the same scale ($\alpha = .76$; $n = 129$). Observed sadness/anxiety was coded during free-play and semistructured activities as part of the observation scans. Sadness was coded in terms intensity and duration on a 4-point scale (1 = *none*, 4 = *strong*; ICC = $.68$ for intake 1 and $.74$ for intake 2).

Peer context aggression. Peers' average aggressive behavior was assessed using a modified version of the externalizing subscale of the Child Behavior Checklist (Achenbach, 1991; Achenbach & Edelbrock, 1983; Lochman & the Conduct Problems Prevention Research Group, 1995), completed by both teachers and observers ($r = .42$, $p < .001$). Teachers ($n = 129$, $\alpha = .96$) were asked to rate participants on 23 items (e.g., "Starts fights with other children") using a 4-point response scale (1 = *never*, 4 = *often*), as were observers ($n = 129$, $\alpha = .97$). Aggression was coded both as part of the observation scans and, given the relative infrequency of aggression in preschools, whenever it occurred (i.e., event

sampling). The presence of aggression was coded (0 = *none*, 1 = *present*), including physical aggression (e.g., punching or the threat of punching; $K = .83$ at intake 1, 1.00 at intake 2). Proportion scores were calculated as a function of the total observations collected for each child; these were substantially associated with teachers' and observers' ratings of externalizing behavior ($r_s = .57$ and $.76$, $p_s < .001$).

Positive peer context. Peers' average positive peer behavior was modeled using three indicators, namely peers' positive emotions (i.e., smiling/laughter), helpfulness, and peer-oriented play ($r_s = .16$ to $.29$, $p_s = .092$ to $.001$), which were taken to represent the positive and gregarious nature of children's peers. Teachers rated children's positive affect using the smiling/laughter subscale from the short form of the CBQ (Putnam & Rothbart, 2006; 6 items, e.g., "Often laughs out loud in play with other children"; $\alpha = .87$, $n = 129$; hereinafter referred to as laughter) using a 7-point response scale (1 = *extremely untrue*, 7 = *extremely true*). Peers' helpfulness was based on participants' nominations during the sociometrics task, in which participants were asked to identify the classmate "who helps out other kids without being asked" the most, second most, and third most (scored 3, 2, and 1, respectively). Each participant's average nomination score was standardized within classrooms in which at least 50% ($n = 113$) of the class completed the tasks, with high scores indicating that a higher proportion of participants nominated that child as being the most helpful; the peers' scores were averaged to create a single score for peer context. Peers' peer-oriented (i.e., social and

parallel) play was coded as described above; the average of the peers' proportion of peer-oriented play behavior was calculated.

Control Variables: Children's Characteristics

Children's verbal ability, gender, age, and hours per week in the preschool were entered as control variables for participant variables.

Age. Children's birth months and years were obtained from the parent questionnaires and from the preschools. Children's ages, in months, were calculated from their birth month to the middle of their respective semesters (i.e., at intakes 1 and 2).

Gender. Children's gender (0 = *male*, 1 = *female*) was derived from parent report. The author provided children's gender where parent reports were absent.

Hours per week. Each participant's hours per week was calculated as the number of waking hours he or she spent at preschool each week (i.e., the number of days multiplied by the number of hours per day, subtracting nap times at the sites offering full-day options).

Verbal ability. The verbal ability of participants was measured using the receptive vocabulary subscale of the Wechsler Preschool and Primary Scale of Intelligence–Third Edition (WPPSI-III; Wechsler, 2002). The WPPSI-III was developed as a proxy measure of the intellectual ability of children aged 2 years 6 months to 7 years 3 months. To assess their receptive vocabulary, children were shown 38 sets of 4 images and were asked to identify one of them, starting with simple objects (e.g., “show me the cup”), building to actions (e.g., “show me

balancing”), and culminating in more complex concepts (e.g., “show me parallel”). Scores were calculated as the sum of correct responses.

Control Variables: Preschool Characteristics

As noted above, data were collected at three preschools, two of which were involved at both intakes. To represent the differences in their teacher-child ratios, curriculum, and schedules, two dummy codes were created for inclusion as control variables. In addition, a separate adult presence variable was calculated to represent site-level differences in adult supervision or involvement in children’s play. Due to the significant and substantial overlap between the adult presence variable and the two site variables (i.e., $r_s = .94$ and $-.88$, $p_s < .001$), it was possible to include only one (i.e., either average adult presence or the pair of site variables) in any given model. Accordingly, each hypothesized model was run twice, once with the adult presence variable, and a second time with the pair of site variables.

Adult presence. The presence of a teacher or other adult (not including the observers) was coded (0 = *none*, 1 = *present*) as part of each 10 s observation. An adult was coded as present when the adult was actively engaged with the child or the child’s group, or when the child could reasonably believe that the adult was observing his or her behavior ($K = .70$ at intake 1, $.75$ at intake 2). The proportion of observations indicating adult presence during free-play periods was calculated for each participant, and then means were calculated for each site ($M_{\text{site1}} = .64$, $M_{\text{site2}} = .37$, and $M_{\text{site3}} = .48$; see Table 1).

Site. To represent site differences in schedules, curriculum, teacher-child ratios, and classroom composition, two dummy codes were included in the analyses to represent the three different sites. One preschool was coded 1 on the first dummy code (i.e., site1) and coded 0 on the second dummy code (i.e., site2). The second preschool was coded 0 on site1 and 1 on site2. The third preschool served as the reference group and was coded 0 (site1), 0 (site2).

Results

Descriptives

The means and standard deviations of the study variables are listed in Tables 1 and 2, first for the analytic sample as a whole and, second, differentiated by site. Whereas significantly different site means were rare in the case of child characteristics, they were predominant amongst the peer context characteristics (only the two peer-rated variables, which were standardized within class, and teacher-rated EC had nonsignificant mean differences). All variables utilized in these analyses had skewness less than 2.0 and kurtosis less than 7.0 (i.e., suggesting they were acceptably normally distributed; Curran, West, & Finch, 1996).

As evidenced in Table 3, measures loading onto the same construct were significantly positively correlated. Further, measures of children's EC were significantly positively related to measures of social competence, but not shyness or reticent behavior. Children's shyness, in turn, was negatively related to aspects of children's social competence (most strongly in the case of teacher-reported shyness) and significantly positively related to observed reticent behavior. The

control variables of age, gender, and verbal ability were typically significantly positively related to the EC and social competence variables, but had few relations with shyness and reticent behavior. Hours per week and the preschool variables (i.e., the two site dummy codes and the adult presence variable), in turn, were significantly positively associated only with observed peer-oriented and reticent behavior. The results above the diagonal in Table 3 represent the partial correlations after controlling for age, gender, verbal ability, and adult presence.

The zero-order associations amongst the peer context variables and their relations to the control variables are listed in Table 4, as are the associations amongst the peer context variables after controlling for age, gender, verbal ability, and adult presence (i.e., above the diagonal). The associations amongst the variables that formed a construct (e.g., teacher-reported sadness, observer-reported sadness, and observed sadness form peer context sadness) were, for the most part, positive and significant. The lone exception amongst the zero-order correlations was a marginal positive relation between peer-rated helpfulness and teacher-rated laughter; this correlation became nonsignificant, as did two other correlations, after controlling for the variables listed above. Most peer context variables were significantly associated with the control variables.

Although not directly relevant to the hypotheses tested herein, the patterns of relations across the various aspects of peer context were generally in the expected direction. Peer context EC had significant negative associations with peer context anger and aggressive behavior, but positive associations with peer-oriented play; its associations with peer context sadness, however, were mixed.

There were many positive significant associations amongst the measures of peer context anger, sadness, and aggressive behavior; the strongest correlations were for different scales completed by the same reporter (i.e., evidencing shared method variance). The measures of positive peer context, in turn, evidenced mixed relations with measures of peer context anger and sadness, including both positive and negative significant associations; for example, teacher-rated sadness was significantly positively related to teacher-rated laughter, but significantly negatively related to peer-rated helpfulness. The measures of positive peer context were significantly positively associated with measures of both peer context EC (i.e., peer-rated helpfulness and teacher-rated laughter were both significantly related to teacher-rated EC, and peer-oriented play was marginally related to parent-rated EC and significantly with lab EC) and peer context aggression (i.e., peer-oriented play was positively associated with all three measures of aggression, and teacher-rated laughter was positively related to teacher-rated externalizing).

The associations between child and peer context characteristics are presented in Table 5. Commonalities between children and their peers were evident when the same variables were used for both child and peer context characteristics: teacher-rated EC ($r = .41, p < .001$), lab EC ($r = .30, p = .001$), and peer-oriented play ($r = .44, p < .001$), but not parent-rated EC ($r = .09, p = .39$). A modest to moderate degree of similarity between the children and their respective peer contexts was evidenced for many of the variables in these analyses ($ns = 99$ to $130, ps = .03$ to less than $.001$; not presented in Table 5): observed

peer-reticent behavior ($r = .36$), teacher-rated popularity ($r = .39$), teacher-rated shyness ($r = .20$), teacher-rated anger ($r = .27$), observer-rated anger ($r = .33$), peer-rated anger ($r = .23$), teacher- and observer-rated sadness ($r_s = .52$ and $.30$), teacher- and observer-rated aggressive behavior ($r_s = .37$ and $.53$), observed physical aggression ($r = .42$), and teacher-rated laughter ($r = .58$). Parent-rated shyness of children and parent-rated shyness of their peers (i.e., parents rating only their own children) were significantly negatively related ($r = -.29, p = .004$). The relations amongst the remaining study variables (i.e., peer-rated liking, peer-rated helpfulness, and observed sadness) were nonsignificant.

Confirmatory Factor Analyses

Confirmatory factor analyses (CFAs) were conducted to assess the viability of the measurement models for seven of the eight latent variables; a CFA was not attempted for children's shyness, which had only two indicators and, as such, was underidentified. As noted above, parent- and teacher-rated shyness had a zero-order correlation of $.37$ ($p < .001$) and a partialled correlation of $.41$ ($p < .001$; i.e., after controlling for gender, age, verbal ability, and adult presence). The remaining seven latent factors were modeled with three indicators, rendering them just-identified. As such, no global fit indices were available; instead, local fit was assessed based on the standardized loadings and R-squared values (i.e., the communalities; see Table 6). As described in greater below, six factors (i.e., children's EC and social competence, and peer context EC, anger, sadness, and positive peer behavior) evidenced at least adequate fit. Only one factor (i.e., peer

context aggression) required a substantial change; due to convergence problems, one of the indicators had to be dropped.

Child's social competence. Children's social competence was modeled with three manifest variables: peer ratings of liking, teacher-rated popularity, and proportion of observed peer-oriented play. For the most part, the factor evidenced at least adequate fit. All three standardized loadings were significant ($ps < .001$), but they were mixed in strength: one was adequate (.47), one was moderate (.54), and one was high (.78). Mixed results were also evidenced amongst the communalities: whereas one R-squared value was adequate at .61, two were quite low (i.e., .22 and .29). Peer-rated liking was originally modeled as the marker variable, but teacher-rated popularity appeared to have a stronger loading. When the analyses were re-run using teacher-rated popularity as the marker; the results did not change appreciably. A third CFA was conducted, modeling both children's EC and social competence; in these results, peer-rated liking had the highest loading. As such, peer-rated liking was retained as the marker variable.

Child's EC. Children's EC was modeled as a latent factor indicated by three manifest variables: teacher-rated EC, as the marker variable; parent-rated EC; and lab EC. The standardized loadings, all of which were significant ($ps < .001$), suggested good fit; amongst these, there were two moderate loadings (.59 and .61) and one high loading (.74). The communalities, however, were rather low; the largest R-squared value was only .55, and the other two variables had larger residuals than communalities. When the factor was modeled simultaneously with children's social competence, the lab EC variable had the

largest loading, suggesting it might be appropriate to switch marker variables when additional factors were added to test the hypothesized structural models.

Peer context EC. Peer context EC was indicated by the peers' averaged parent-rated EC, averaged teacher-rated EC, and lab EC. As was the case with child's EC, teacher-rated EC was originally selected as the marker variable for peer context EC; average lab EC, however, had the largest loading in the CFA. Two standardized loadings were high (.70 and .74), and one was adequate (.49); all three were significant ($ps < .001$). The R-squared values were predominantly low, ranging from .24 to .55. The factor was retained with the caveat that the lab EC variable appeared to be the more appropriate marker.

Peer context anger. Peer context anger was modeled using the peers' averaged peer-rated anger (the marker variable), teacher-rated anger, and observer-rated anger. The three standardized variables were all significant ($ps < .001$); one loading was adequate (.44), one was moderate (.57), and one was high (.77). The R-squared values ranged from .20 to .60.

Peer context sadness. Peer context sadness was indicated by the peers' averaged teacher-rated sadness (the marker variable), observer-rated sadness, and observed sadness. All three standardized loadings were statistically significant ($ps < .001$), although mixed in strength: adequate (.42), moderate (.51), and high (.81). The R-squared values ranged from .18 to .65.

Peer context aggression. Peer context aggression was composed of the peers' averaged teacher-rated externalizing behavior (the marker variable), parent-rated externalizing behavior, and observed physical aggression. CFA

results were not obtained, however, due to convergence problems. Given the limited range of the observed aggression variable (i.e., the individual proportion scores ranged from .00 to .07 and the peer context averages ranged from .00 to .05; $M = .00$, $SD = .01$, for both individual and peer context aggression) and its substantial correlation with both teacher- and observer-rated externalizing (.57 and .76; $ps < .001$), the variable was dropped. A CFA could not be performed for the resultant factor as, with only two indicators, it was rendered underidentified.

Positive peer context. Positive peer context was constituted by the peers' averaged teacher-rated laughter (the marker variable), peer-rated helpfulness, and observed peer-oriented play. All three standardized loadings, which ranged from .33 to .61 (i.e., from adequate to moderate), were statistically significant ($ps = .003$ to $.014$). Of note, the unstandardized loading for observed peer-oriented play was nonsignificant; however, its standardized loading of .61 was the strongest. The R-squared values were all low, ranging from .11 to .38. Considered together, this was taken as evidence of the potentially problematic structure of this latent variable.

Structural Equation Models

Subsequently, structural equation models were run to test the proposed hypotheses. To test for moderation, the hypotheses were modeled as latent variable interactions and tested using structural equation modeling (SEM) in Mplus 6.1 (Muthén & Muthén, 1998-2010). As the data represented only a single measurement period for each child, the models denote association and not

causality given the absence of the research design elements necessary to more definitively establish temporal precedence.

The relative fit of the non-nested models was assessed using the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC). The baseline model used by Mplus 6.1 is inappropriate for SEM models involving latent variable interactions (Kelava et al., 2011); as such, no other indices of global or local fit were available. In the presence of significant interactions, the main effects were not interpreted. Instead, the results were recast into simple slope equations following Aiken and West (1991): at the mean of the latent variables, which were centered at zero; at 1 *SD* above the mean, referred to as the high value of the moderator; and at 1 *SD* below the mean, referred to as low). Because it was not possible to re-define the latent variables in Mplus (i.e., to model the moderator at high and low values, as defined above), the degree to which each slope differed significantly from zero could not be ascertained; however, it can be inferred, following Aiken and West (1991), that the significant interaction term indicates that at least some of the simple regression lines differed significantly from each other. In the case of nonsignificant interactions, the models were re-run without the interaction term to test the significance of the main effects of the peer context variables.

Gender, age, verbal ability, hours per week, and adult presence were added as potential control variables to the original models; all nonsignificant paths were dropped from the final models. In models in which the peer context variables, children's EC, or children's shyness significantly regressed on control

variables, residual variances (i.e., rather than variances) were included in the output. In these cases, the variance had to be calculated for the latent factor by hand using the matrix formula $\Gamma\Phi\Gamma' + \zeta$, where Γ represents the beta matrix for the variable of interest (i.e., the paths between the control variables and the variable for which variance was being calculated), Φ represents the variance-covariance matrix for the control variables that predicted the variable of interest, and ζ represents the residual variance for the variable for which variance was being predicted. The covariance between children's EC or shyness and the peer context factor was initially freely estimated; where their covariance was nonsignificant and near zero, the model was re-run, constraining the relation to be zero in order to improve fit.

As a default, Mplus 6.1 uses full information maximum likelihood (FIML) to handle missing data. The use of maximum likelihood estimation is one of two missing data approaches recommended by Schafer and Graham (2002; see also Collins, Schafer, & Kam, 2001; Schreiber, 2008) when data are missing at random. Per Collins et al. (2001), FIML estimation is generally robust when less than 25% of the data are missing and when the correlation between the variable evidencing missingness and the variable causing missingness is less than .40. FIML estimation is improved by the addition of auxiliary variables in the structural equation model (Graham, 2003). To ensure listwise deletion did not occur, the variances of the variables were explicitly modeled. The integration algorithm (random type) was utilized to perform the analyses. Only the unstandardized estimates are reported below; standardized results are not

produced in Mplus analyses using the random coefficient regression command, which was required for the analysis of latent variable interactions. Similarly, neither modification indices nor correlation residuals are currently available with these analyses.

Adult Presence and Site Variables. Adult presence (i.e., calculated as a proportion of the total observations) differed significantly across the three sites, $F(2, 128) = 117.16, p < .001$. Post hoc analyses showed that each preschool's mean differed significantly from the other two sites' means ($M_{\text{site1}} = .64, M_{\text{site2}} = .37$, and $M_{\text{site3}} = .48$; see Table 1). All site-level differences in study variables are presented in Tables 1 and 2.

Looking to the correlations in Table 3, the adult presence variable and the site1 variable had the same pattern of associations with the key variables included in the study (i.e., same valence and similar strength of association). Similar patterns of association were evidenced in Table 4 (i.e., with variables representing peer context) as well, although the strength of the associations sometimes differed. Of note, the correlations associated with site2 consistently had the opposite valence from that of the site1 and adult presence variables. This pattern of relations is of particular interest given that site1 had a higher teacher-student ratio than did the other two sites.

As noted above, given the significant and substantial overlap between the adult presence variable and the two site variables, it was inappropriate to include both simultaneously in a single model. Moreover, from a conceptual perspective, teacher-student ratios (i.e., which would affect adult presence in the classroom

and playground) are subsumed under a broader set of site level differences, which can include curriculum, schedules, and population differences. Accordingly, each model in the EC and shy model series was run initially with the adult presence variable and, subsequently, with the pair of site dummy codes (i.e., site1 and site2) to determine which approach was more informative and offered the best fit.

Adult presence was significantly negatively associated with peer context EC, sadness, and aggression in both the EC and shy model series; with peer context anger in the shy model series only; and with positive peer contexts in the EC model series only. Adult presence, however, was not significantly associated with positive peer contexts in the shy model series or with peer context anger in the EC model series. It predicted a child-level variable in only one model (i.e., reticent behavior in the shy model with peer context EC).

Adding the dummy variables to the EC models in lieu of the adult presence variable was generally problematic. Although the fit of the two competing models was generally comparable, shifting to using the site variables affected the measurement models and structural models. For example, in the positive peer context model, previously-significant loadings on the social competence and peer context factors were rendered marginal or nonsignificant. In the peer context aggression model, relations with the control variables were substantially altered: gender had to be dropped from the model; relations between verbal ability and social competence, and between age and EC, became nonsignificant; and the constraint on the relation between children's EC and the

peer context variable had to be freed. Moreover, the significant interaction term in the peer context anger model was rendered marginal.

Using the two site dummy codes had a similar impact on the shy model series. In a number of cases, the models did not converge if the site variables were merely entered in place of the adult presence variable; for example, verbal ability had to be dropped from the peer context sadness model, and the site variables predicted shyness in the peer context EC model. Additionally, the significant interaction involving peer context anger (i.e., the two-variable version) shifted from being significant to nonsignificant and the measurement model for peer context anger decompensated. The fit of these models tended to be comparable to, or worse than, the adult presence models.

Overall, then, the use of the site variables tended to be problematic. In addition, using the site variables did not add much information; in many cases, the site1 dummy code and the adult presence variable presented a similar pattern of relations to the other study variables. Moreover, the introduction of the site variables was associated with a loss of information, as a number of control variables had to be dropped from the models in order to achieve convergence; in doing so, a number of relations that were substantiated by the literature were lost (e.g., the regression of EC on age). Accordingly, the models involving adult presence were retained and are described below.

EC models. As was expected, children's EC was a significant positive predictor of their social competence in all five models (i.e., peer context EC, anger, sadness, aggressive behavior, and positive peer behavior). Only two

models, however, evidenced significant moderation by peer context: peer context EC (Figures 12 and 13) and peer context anger (Figures 14 and 15). Both significant interactions were plotted, treating the peer context variable as the moderating variable. With respect to the control variables, age, verbal ability, gender, and adult presence figured prominently in the models; in contrast, children's hours per week only appeared once (i.e., in the model with peer context sadness, Figure 16). Of note, both age and verbal ability significantly predicted children's EC in all five models, both verbal ability and gender (girls were higher) significantly predicted children's social competence in all five models, and adult presence significantly negatively predicted the peer context factor in four models.

Overall, the AIC and BIC values of the EC models were larger than their respective counterparts in the shy model series, suggesting worse fit. Additionally, in contrast with the shy model series, the EC models provided little evidence of the moderating effect of the selected peer context characteristics—only two of the five models had significant interactions (i.e., peer context EC and anger). Moreover, the model involving peer context EC produced relations that were not in line with either the empirical or theoretical underpinnings described above.

EC model with peer context EC. This model was originally run with teacher-rated EC as the marker variable for children's EC; however, as the lab EC variable had a stronger loading, the model was re-run using lab EC as the marker variable. In the final model (Figure 12), children's social competence significantly regressed on children's EC ($B = 1.53, p < .001$), peer context EC (B

= -2.14, $p = .001$), and their product ($B = 0.77$, $p = .001$), as well as children's gender ($B = 0.49$, $p = .002$) and, marginally, verbal ability ($B = -0.03$, $p = .05$; AIC = 3221.33, BIC = 3336.64). Age and verbal ability significantly positively predicted children's EC, and adult presence significantly negatively predicted peer context EC. The covariance between the residual variances for children's and peer context EC was specified to be zero. The significant interaction was plotted (Figure 13); the interaction was ordinal wherein, unexpectedly, children in high-EC peer contexts had the strongest relation between their own EC and social competence, but the lowest scores. The regression equations for the simple effects were as follows: for low peer context EC, predicted social competence equaled $1.39\text{childEC} + .49\text{GENDER} - .03\text{VERBAL} + .39$; for moderate peer context EC, $1.53\text{childEC} + .49\text{GENDER} - .03\text{VERBAL} + 0$; and for high peer context EC, $1.67\text{childEC} + .49\text{GENDER} - .03\text{VERBAL} - .39$.

Given the unexpected pattern of results and evidence of the quadratic effects of EC in the literature (e.g., Carlson & Wang, 2007), a quadratic term for children's EC was added to the model. It was nonsignificant ($B = 0.14$, $p = .49$; AIC = 3222.62, BIC = 3340.81) and rendered the regression coefficient for children's EC nonsignificant ($B = 0.82$, $p = .38$). In a separate model, a quadratic term for peer context EC was tested, but its regression coefficient was also nonsignificant ($B = -0.03$, $p = .92$; AIC = 3223.32, BIC = 3341.51); in this model, the other three regression coefficients (i.e., child EC, peer context EC, and their product) remained significant. Neither quadratic term was retained.

EC model with peer context anger. Children's social competence was regressed onto children's EC ($B = 1.44, p < .001$), peer context anger ($B = -0.44, p = .47$), and their product ($B = 0.54, p = .02$), as well as children's gender ($B = 0.51, p = .004$) and verbal ability ($B = -0.05, p = .02$; AIC = 3449.04, BIC = 3564.36; Figure 14). Age and verbal ability significantly positively predicted children's EC; this was the one EC model in which adult presence did not significantly predict the peer context variable. The residual variances for children's EC and peer context anger were significantly negatively related. The significant interaction was plotted (Figure 15) and evidenced an ordinal relation wherein, as hypothesized, high peer context anger evidenced the lowest social competence scores but the strongest positive relation between children's EC and social competence. The regression equations for the simple effects were as follows: for low peer context EC, predicted social competence equaled $1.15\text{childEC} + .51\text{GENDER} - .05\text{VERBAL} + .23$; for moderate peer context EC, $1.44\text{childEC} + .51\text{GENDER} - .05\text{VERBAL} + 0$; and for high peer context EC, $1.73\text{childEC} + .51\text{GENDER} - .05\text{VERBAL} - .23$.

EC model with peer context sadness. Children's social competence was regressed onto children's EC ($B = 1.03, p = .01$), peer context sadness ($B = 0.10, p = .80$), and their product ($B = -0.002, p = .99$), as well as verbal ability ($B = -0.04, p = .04$) and gender ($B = 0.39, p = .02$; AIC = 2355.20, BIC = 2473.40; Figure 16). Both age and verbal ability significantly positively predicted children's EC, and both adult presence and hours per week significantly predicted peer context sadness (negatively and positively, respectively). The covariance between the

residual variances for children's and peer context sadness was specified to be zero. The model was re-run without the nonsignificant interaction term; children's EC had a significant main effect ($B = 1.04, p < .001$), but peer context sadness did not ($B = 0.09, p = .30$; AIC = 2353.20, BIC = 2468.52).

EC model with peer context aggression. Children's social competence was regressed onto children's EC ($B = 1.56, p = .002$), peer context aggression ($B = -1.43, p = .17$), and their product ($B = 0.58, p = .13$), as well as children's gender ($B = 0.45, p = .005$) and verbal ability ($B = -0.04, p = .04$; AIC = 2801.05, BIC = 2910.60; Figure 17). Age and verbal ability significantly positively predicted children's EC, and both adult presence and gender (i.e., boys engaged in more aggressive behavior) significantly negatively predicted peer context aggression. The covariance between the residual variances for children's and peer context aggression was specified to be zero. A model with only main effects was run; a significant main effect was obtained for children's EC ($B = 1.06, p < .001$) but not peer context aggression ($B = 0.03, p = .93$; AIC = 2801.19, BIC = 2907.85).

EC model with positive peer context. Children's social competence was regressed on children's EC ($B = 0.98, p = .005$), positive peer context ($B = -0.87, p = .23$), and their product ($B = 0.36, p = .11$), as well as children's gender ($B = 0.43, p = .01$) and verbal ability ($B = -0.03, p = .05$; AIC = 2915.75, BIC = 3033.94; Figure 18). Age and verbal ability significantly positively predicted children's EC, and both adult presence (negatively) and age (positively) significantly predicted positive peer context. The covariance between the residual

variances for children's and peer context aggression was specified to be zero. A model with only main effects was run; a significant main effect was obtained for children's EC ($B = 0.98, p < .001$) but not positive peer context ($B = 0.14, p = .51$; AIC = 2915.58, BIC = 3030.90).

Shy Models. Children's proportion of reticent behavior was regressed on children's shyness and one of five peer context characteristics (i.e., peer context EC, anger, sadness, aggressive behavior, and positive peer behavior), as well as the interaction between the two. In contrast to the EC models, significant interactions were obtained for all five shy models; all significant interactions were plotted using the peer context variable as the moderator. Shyness significantly positively predicted reticent behavior in all models save the peer context EC models. With respect to the control variables, adult presence significantly negatively predicted the peer context variables in all the models. In addition, age (positively) and adult presence (negatively) significantly predicted children's reticence in only the peer context EC model. Verbal ability only significantly predicted shyness in the peer context sadness model. Hours per week and gender were dropped from all models due to nonsignificant relations. The covariance between children's shyness and the residual for each peer context construct was constrained to be zero in all models except the peer context sadness model. The shy models had lower AIC and BIC values than did their respective EC models; the peer context sadness, aggressive behavior, and positive peer behavior models had the lowest AIC and BIC values overall.

Shy model with peer context EC. In this model, children's reticent behavior was regressed onto children's shyness ($B = 0.01, p = .68$), peer context EC ($B = 0.02, p = .07$), and their product ($B = 0.06, p = .05$), as well as children's age ($B = -0.002, p = .003$) and adult presence ($B = -0.19, p < .001$; AIC = 1571.55, BIC = 1655.15; Figure 19). Both adult presence (negatively) and age (positively) significantly predicted peer context EC; no other control variables had significant relations. The significant interaction was plotted in Figure 20. Unexpectedly, high-EC peer contexts exacerbated the positive relation between shyness and reticent behavior in this disordinal (i.e., cross-over) interaction.

To explore these unexpected results, and given previous findings of quadratic relations in analyses involving effortful control (e.g., Carlson & Wang, 2007), a quadratic term for peer context EC was added to the model. In this model, children's reticent behavior was significantly predicted by the linear x linear interaction term ($B = 0.05, p = .03$), age ($B = -0.002, p = .003$), and adult presence ($B = -0.18, p < .001$), as well as marginally by the quadratic term ($B = 0.03, p = .07$; AIC = 1570.10, BIC = 1656.58; Figure 21). A linear x quadratic term (i.e., shyness x peer context EC²) was subsequently added but was nonsignificant ($B = 0.03, p = .20$; AIC = 1570.30, BIC = 1659.66) and, as such, was not retained. The significant interaction and quadratic effects were plotted; the resulting surface plot (Figure 22) evidenced a U-shaped surface as a function of the levels of peer context EC. Contrary to expectations, the weakest relation (slope) between shyness and reticent behavior and the lowest proportions of reticent behavior were observed for moderate-EC peer contexts. Instead, the

strongest relation between shyness and reticent behavior and the highest proportions of reticent behavior were associated with high-EC peer contexts, and secondarily (i.e., less so) with low-EC peer contexts. The regression equations for the simple effects were as follows: for low peer context EC, predicted reticent behavior equaled $-.01\text{Shy} + .006\text{PeerEC}^2 - .002\text{AGE} - .18\text{AD_PRES} + .30$; for moderate peer context EC, $.01\text{Shy} - .002\text{AGE} - .18\text{AD_PRES} + .30$; and for high peer context EC, $.04\text{Shy} + .006\text{PeerEC}^2 - .002\text{AGE} - .18\text{AD_PRES} + .31$.

Shy model with peer context anger. Children's reticent behavior regressed significantly onto children's shyness ($B = 0.20, p = .002$), peer context anger ($B = 0.06, p = .008$), and their product ($B = 0.08, p = .05$; AIC = 1128.79, BIC = 1189.33; Figure 23). Of note, when the model was run using peer-rated anger as the marker variable (i.e., as it was in the CFA, reviewed above), it did not converge; the following results derived from a model using teacher-rated anger as the marker variable. Adult presence significantly negatively predicted peer context EC; no other control variables had significant relations. Using peer context anger as the moderator, the plot (Figure 24) evidenced an ordinal, exacerbating interaction wherein, as predicted, higher levels of peer context anger strengthened the positive relation between shyness and reticent behavior. The regression equations for the simple effects were as follows: for low peer context anger, predicted reticent behavior equaled $.16\text{Shy} + .20$; for moderate peer context anger, $.20\text{Shy} + .23$; and for high peer context anger, $.24\text{Shy} + .26$.

Contrary to the CFA results, however, the loadings for peer context anger suggested a lack of coherence amongst the indicators, as two of the three loadings

(i.e., peer- and observer-rated anger) had nonsignificant loadings. To determine whether the construct would cohere better and perform differently with a subset of the original three indicators, the model was re-run with only two variables loading on the peer context anger construct. Although peer-rated anger had the lowest loading in this model, it had the highest standardized loading in the CFA (see Table 6); as such, observer-rated anger was dropped in favor of using teacher- and peer-rated anger.

In the updated two-indicator model, peer-rated anger again served as the marker variable; although teacher-rated anger had a higher loading, the model did not converge when teacher-rated anger was identified as the marker variable. Children's reticent behavior regressed significantly onto children's shyness ($B = 0.20, p = .001$), peer context anger ($B = 1.03, p = .02$), and their product ($B = 1.32, p = .04$; AIC = 895.63, BIC = 947.52; Figure 25). Adult presence significantly negatively predicted peer context EC; no other control variables had significant relations. By dropping the observer-reported anger from the model, the two remaining variables indicating the peer context anger factor cohered better; the regression coefficient for the interaction term was significant, whereas it was marginal in the three-variable version; and the AIC and BIC values were smaller.

The significant interaction involving the two-variable version of peer context anger was plotted; it also evidenced an ordinal, exacerbating effect wherein higher levels of peer context anger strengthened the positive relation between shyness and reticent behavior (Figure 26). Low peer context anger,

however, evidenced a negative slope. Accordingly, in dropping observer-rated anger, a more pronounced interaction effect was observed. The equations for the simple regressions were as follows: for low peer context anger, predicted reticent behavior equaled $-.44\text{Shy} - .27$; for moderate peer context anger, $.21\text{Shy} + .23$; and for high peer context anger, $.85\text{Shy} + .74$.

Shy model with peer context sadness. Children's reticent behavior regressed significantly onto children's shyness ($B = 0.22, p < .001$), peer context sadness ($B = 0.08, p = .002$), and their product ($B = 0.06, p = .001$; AIC = 759.89, BIC = 831.63; Figure 27). Adult presence significantly negatively predicted peer context sadness, and verbal ability significantly negatively predicted children's shyness. Using peer context sadness as the moderator, the plot (Figure 28) evidenced, as predicted, an ordinal, exacerbating interaction wherein higher levels of peer context sadness strengthened the positive relation between shyness and reticent behavior. The regression equations for the simple effects were as follows: for low peer context sadness, predicted reticent behavior equaled $.18\text{Shy} + .32$; for moderate peer context sadness, $.22\text{Shy} + .37$; and for high peer context sadness, $.26\text{Shy} + .42$.

Shy model with peer context aggression. Children's reticent behavior regressed significantly onto children's shyness ($B = 0.22, p < .001$), peer context aggression ($B = 0.13, p < .001$), and their product ($B = 0.17, p = .009$; AIC = 475.06, BIC = 526.95; Figure 29). Adult presence significantly negatively predicted peer context aggression. Using peer context aggression as the moderator, the plot (Figure 30) evidenced an ordinal, exacerbating interaction

wherein, as predicted, higher levels of peer context aggression strengthened the positive relation between shyness and reticent behavior. The regression equations for the simple effects were as follows: for low peer context aggression, predicted reticent behavior equaled $.17\text{Shy} + .21$; for moderate peer context aggression, $.22\text{Shy} + .24$; and for high peer context aggression, $.26\text{Shy} + .27$.

Shy model with positive peer context. As hypothesized, children's reticent behavior regressed significantly onto children's shyness ($B = 0.02, p < .001$), positive peer context ($B = 0.12, p < .001$), their product ($B = 0.02, p < .001$), and a quadratic peer context effect ($B = 0.04, p < .001$; AIC = 651.51, BIC = 712.05; Figure 31). No control variables were significant. A linear x quadratic term was added to the model, and it was significant. In the resulting model, reticent behavior was regressed onto children's shyness ($B = 0.01, p = .34$), positive peer context ($B = 0.04, p = .05$), their product ($B = 0.01, p = .91$), a quadratic peer context effect ($B = 0.13, p < .001$), and a linear x quadratic interaction (i.e., shy x positive peer context²; $B = 0.09, p = .005$; AIC = 660.21, BIC = 723.64; Figure 32). Although the AIC and BIC for the linear x quadratic interaction model were slightly larger than the original model without the linear x quadratic interaction term, the difference was negligible.

The associated surface plot is provided as Figure 33, and its associated line plot is Figure 34. The surface plot (Figure 33) evidenced a positive quadratic relation that had a different shape at each level of children's shyness and a stronger slope as it moved away from a moderate positive peer context. Children in moderate positive peer contexts, represented by the line in the surface area at

the mean (i.e., at zero) of the positive peer context variable, evidenced low levels of reticent behavior. Moreover, children's shyness had a weak positive relation with observed reticent behavior in moderate positive peer contexts; a stronger relation was evidenced at 1 *SD* above and below the mean, which became more pronounced at +/-2 *SD* from the mean. As a function of these simple regression lines, the surface of the plot had a U shape, with a pronounced dip at the mean of positive peer context.

The regression equations for the simple effects were as follows: for low positive peer contexts, predicted reticent behavior equaled $.007\text{Shy} + .009\text{PositivePC}^2 + .006(\text{Shy} \times \text{PositivePC}^2) + .09$; for moderate positive peer contexts, $.01\text{Shy} + .10$; and for high positive peer contexts, $.01\text{Shy} + .009\text{PositivePC}^2 + .006(\text{Shy} \times \text{PositivePC}^2) + .11$.

Discussion

The relevance of children's peers' characteristics to children's social, emotional, cognitive, and moral development has been established, with evidence of the moderating role of peer contexts accumulating over the last decade. The results obtained herein further substantiate this role, but not without caveats. Peer context did not play as large a role in the EC model series as anticipated; only two models generated significant interactions. In contrast, all five shy models produced significant interactions terms. In both series, however, the model involving peer context EC produced counterintuitive results in which high-EC peer contexts were associated with the worst outcomes rather than the best, and the strongest slopes rather than the weakest slopes.

EC Models

Consistent with the literature, the path from children's EC to their social competence was significant and positive in all five models. In addition, both age and verbal ability significantly predicted children's EC as would be expected given the literature described above. Gender significantly predicted children's social competence, with girls receiving higher scores; these results are also in keeping with the literature. Taken together, these results suggest that the models were performing as would be expected.

Contrary to expectations, the EC models provided only limited support for the moderating role of peer context in the relation between EC and social competence. Significant interactions were obtained with peer context EC and peer context anger, but not in the remaining three models. All the more worrisome, one of the significant interactions (i.e., children's EC with peer context EC) produced counterintuitive results; this model is discussed below, in tandem with the shy model's results.

As hypothesized, peer context anger moderated the positive relation between children's EC and social competence, with high levels of peer context anger strengthening the association. Children in peer contexts high in anger also were expected to evidence lower social competence than they would in peer contexts low or moderate in anger. These results are of significance given that although peers' aggressive behavior has been demonstrated to interact with an individual's characteristics towards deleterious ends, peers' anger has not yet been studied in this manner.

It might be argued that anger is a milder relative of aggression or, alternatively, a concomitant of aggression; the positive correlations amongst the indicators of the two factors certainly are indicative of such a relation ($r_s = .23$ to $.50$ for cross-method correlations, and $r_s = .72$ to $.74$ for same-reporter correlations, $p_s = .009$ to less than $.001$; see Table 4). Relying on anger's relation to aggression, however, is insufficient to explain the results given that the peer context aggression model did not produce significant results. This finding suggests that anger in the peer context can be sufficient to engender a negative effect on the members of that context.

In the three models that did not produce significant results (i.e., peer context sadness, aggressive behavior, and positive peer behavior), peer context neither interacted with children's EC to predict children's social competence nor evidenced a main effect, even after dropping the interaction term from the model. For the peer context sadness and aggressiveness models, the lack of association was borne out in the correlations presented in Table 5. Significant correlations amongst the measures of children's EC and their peers' sadness were scarce, particularly after partialing out gender, age, verbal ability, and adult presence; the same held true for the correlations amongst the measures of children's EC and their peers' aggressiveness. There were a greater number of significant zero-order associations between peer context's positive peer orientation and children's social competence (i.e., 5 significant and 1 marginally significant out of 9 correlations; see Table 5); however, most lost their significance as partialled correlations,

although one previously nonsignificant positive correlation became a marginally significant negative association.

In explaining the lack of results, it is important to note that sadness and aggressiveness were observed relatively infrequently in the preschools. For peer context sadness, all three variables evidenced a compressed range on the lower end of the variables' scales: teacher-rated sadness (1.14 to 4.72 on a 7-point scale; $M = 2.94$, $SD = .92$), observer-rated sadness (2.37 to 4.38 on a 7-point scale; $M = 3.35$, $SD = .41$), and observed sadness (proportion = .00 to .07; $M = .02$, $SD = .02$). The two indicators of peer context aggression similarly had a compressed range on the lower end of the variables' scales: teacher-rated externalizing (1.00 to 3.37 on a 7-point scale; $M = 1.46$, $SD = .42$) and observer-rated externalizing (1.03 to 2.92 on a 7-point scale; $M = 1.39$, $SD = .29$). These data suggest that the failure to obtain results in these two models could derive from a lack of sufficiently strong stimuli to evidence an effect. This explanation does not hold for the positive peer context model, however, as all three indicators exhibited wider ranges: teacher-rated laughter (1.95 to 7.00 on a 7-point scale; $M = 5.76$, $SD = .88$), peer-rated helpfulness (-1.31 to 1.48 on a standardized scale; $M = .18$, $SD = .57$), and observed peer-oriented play (proportion = .34 to .73; $M = .56$, $SD = .09$).

Shy Models

Shyness significantly and positively predicted reticent behavior, as would be expected given the literature, in four of the five models. A nonsignificant positive regression coefficient was evidenced only in the model involving peer

context EC; this result was not particularly worrisome, however, given the presence of a significant interaction term between shyness and the peer context variable. In line with the literature, none of the child control variables (i.e., gender, age, and verbal ability) significantly predicted shyness. In the peer context EC model only, children's age significantly predicted both peer context EC (positively) and children's reticent behavior (negatively). Overall, then, the models produced expected effects.

The shy model series provided the strongest evidence for the moderating effect of peer context. Significant interaction effects were evidenced in all five models. In all but one model (i.e., peer context sadness), children's shyness was unrelated peer context. Counterintuitive results were obtained once again, however, from the peer context EC model (discussed below). A more nuanced relation amongst the variables was found in two of the models; significant quadratic terms for the peer context variables were found in both the peer context EC and positive peer context models, as well as a quadratic x shy interaction in the latter. The small values of the betas in these models might be striking, but a look to the scale and observed range of the dependent variable (i.e., proportion of observed reticence; range = .04 to .37, $M = .13$, $SD = .06$) puts these results into perspective.

Just as the relation between shyness and reticence was magnified by peer victimization in the findings of Gazelle and colleagues (Gazelle & Ladd, 2003; Gazelle & Rudolph, 2004), aggressive peer contexts exacerbated the relation between shyness and reticent behavior in the current study. Unlike the work of

Gazelle and colleagues (Gazelle & Ladd, 2003; Gazelle & Rudolph, 2004), the aggression in these analyses was not necessarily directed at the target child; rather, it reflected the average level of aggression and other externalizing behavior exhibited by the child's immediate peers. The deleterious effect of aggressive peer contexts (i.e., as opposed to aggression against the child per se) on children's behavior also has been evidenced in the research testing for interactions between peers' characteristics and the characteristics of children and youth in predicting their own aggressive behavior (e.g., van Lier et al., 2007). These results, then, are in line with and extend the literature on this topic.

Anger and sadness in the peer context acted similarly on the relation between shyness and reticence; having a peer context high in sadness or anger steepened the pitch of the slope. Of note, I suggested above that the compressed range of the peer context sadness and aggression variables was to blame for the lack of results in the EC model series; here, however, they appeared unproblematic. It might be argued that the reason for this difference is that shy children have more exposure to anger, sadness, and aggression in the peer context by virtue of their characteristics. On the other hand, this does not appear to be the case given the lack of significant associations between children's shyness and the latent factors representing the different aspects of peer context. Instead, shy children might be more attuned to the potentially aversive aspects of their social environment given their increased vigilance and sensitivity to threat. As noted earlier, this applies not only to peer context anger and aggressiveness, but also to

peer context sadness—a sad peer can be as indicative of a threat in the environment as an angry or aggressive peer.

Positive peer context (i.e., operationalized in terms of popularity, helpfulness, and peer-oriented play), which evidenced a linear x quadratic interaction, also exacerbated the relation between children's shyness and reticent behavior at high and low levels, with the lowest reticence and weakest slope associated with moderate levels of positive peer context, as hypothesized. These findings warrant further discussion given the natural intuition that positive peer contexts would encourage shy children to engage with their peers rather than withdraw. Although moderate positive peer contexts were expected to do just that, high positive peer contexts were hypothesized to prove threatening as a function of shy children's fear of negative evaluation and difficulty initiating social interactions. If indeed shy children's sensitivity to threat can be as highly tuned as the models involving peer context sadness and aggressive behavior suggest, then they could be equally attuned to social cues that might imply that their peers will judge them harshly or spurn their social initiatives. For example, shy children might fear that children who are popular, in a tightly-knit group, and highly enjoying themselves (e.g., laughing heartily) will not welcome the intrusion of someone not currently in their circle. Revisiting the results of Gazelle et al. (2005), who found that shy children evidenced greater reticence in groups of familiar peers than unfamiliar peers, in this light suggests that the inclusion of the popular child in the familiar peer grouping could have exacerbated the shy child's

fear of negative evaluation more than a familiar group of low status children would.

Models involving Peer Context EC

In both the EC and shy model series, the models involving peer context EC produced unexpected results. Higher peer context EC was hypothesized to result in better outcomes in each model: (a) in the EC model, to scaffold the highest social competence scores amongst all its members and thus weaken the positive association between EC and social competence; and, (b) in the shy model, to prove least threatening and thus be associated with the lowest proportions of reticent behavior and strongest relation between shyness and observed reticence. In fact, the reverse was found; high peer context EC was associated with worse, rather than better, outcomes.

Given that many of the obtained effects in these models are in line with past research and that peer context EC was associated with an analogous deleterious effect in both the EC and shy models, the peer context EC results could not be disregarded wholesale. Rather, an attempt was made to identify the source of the unexpected results. One potential explanation relates to the EC construct itself; it is possible that high EC as measured herein reflected reactive control rather than EC proper despite our efforts to avoid just this result. It was noted in the introduction that an important distinction was to be made between inhibitory control and inhibition, and activation control was included in the EC composite for just this purpose. It is possible, however, that this goal was not achieved either due to the low reliabilities of some of the EC subscales or because

the activation control scale did not suffice to shift the scores of inhibited children out of the high EC category. The presence of a significant quadratic term in the shy x peer context EC model is certainly in line with this prospect.

A suppression effect also might be responsible for the pattern of results obtained. Although limited in number, significant and marginally significant positive associations existed between peer context EC variables and the measures of children's outcomes (i.e., social competence and reticent behavior; see Table 5). Despite the presence of these significant positive associations, however, the coefficient for peer context EC in the EC and shy models were negative. In the case of classical suppression, this can occur as a function of the variance in the outcome variable being accounted for by another, unrelated predictor; as a consequence, the R-squared for the outcome variable is increased and the coefficient for one of the predictors becomes negative.

An alternative explanation arose from the observation that a similar pattern of results existed for the peer context EC and positive peer context models in the shy series. In an effort to identify the basis for the similarity, the zero-order correlations amongst the indicators of the two peer context factors were examined. Surprisingly, a significant and substantial positive association was found between teacher-rated laughter and children's lab EC (i.e., the average of the four lab tasks; $r = .61, p < .001$). This high level of association might derive from a common characteristic; for example, both children who laugh or smile a great deal with their peers and children who engage in games (as the lab tasks were referred to) with adult strangers might be highly sociable. If, as argued

above, high levels of sociability can engender withdrawal in shy children, and if performing well in lab tasks is associated with high levels of sociability, then high levels of peer context EC (i.e., which was based, in part, on EC observed in the lab tasks) might be equally problematic.

To test whether the significant associations of peer context EC would hold in the absence of lab EC, the shy and EC models were re-run, dropping lab EC from the peer context EC construct. The end result was that neither model evidenced a significant interaction effect or main effect of peer context EC after dropping peers' lab EC from the peer context EC construct. These results call into question not only the role of peers' EC as a moderator of the relations included in this study, but also how parent and teacher ratings of EC might differ from EC scores on laboratory tasks.

Developmental Implications

Research has demonstrated that children's play serves as a powerful conduit for their social, emotional, cognitive, and moral development including self-regulation (Bodrova & Leong, 2009), theory of mind (Ashiabi, 2007; Whittington & Floyd, 2009), perspective-taking (Ashiabi, 2007; Saracho, 1999), negotiation and problem-solving skills (Ashiabi, 2007; Rubin, 1982), language and categorization schemas (Saracho, 1999), notions of reciprocity (Piaget, 1932/1965; Youniss, 1994), and emotion regulation (Ashiabi, 2007). Accordingly, environmental conditions that systematically reduce a child's opportunities to play with their peers can have serious consequences for children's development, particularly where those peer contexts are enduring and

occur during children's formative years. Long-term exposure to peer contexts that exacerbate the positive relation between shyness and reticence, for instance, might contribute to the stability of shyness described in the literature. The necessary caveats, of course, are that peer context is expected to have a weaker influence when children are very young due to their limited exposure to peers and to have greater importance in older children and adolescents as they define themselves in relation to their peers, as well as a diminishing effect on children's longer-term development given the addition of new influences as they age.

The Implications of Adult Presence

As reported in Table 4, adult presence was significantly negatively related to teacher-rated anger, all three sadness variables (i.e., teacher-rated sadness, observer-rated sadness, and observed sadness), and all three aggression variables (i.e., teacher-rated externalizing, observer-rated externalizing, and observed physical aggression). Accordingly, these results suggest that where adults tended to be present, preschoolers were rated as having lower sadness, aggression, and anger. These results accord with the previous findings that children in classrooms with high teacher-child ratios evidenced lower levels of aggression (e.g., Hauser-Cram et al., 1993). Significant negative associations also were found for peer-oriented play (both for the target children and the members of their peer contexts; Tables 3 and 4), reticent behavior, and peers' teacher-rated laughter. These findings are in line with findings that children engage in less play with their peers and are more oriented towards their teachers when teachers are present (Fabes, Hanish, & Martin, 2003; Hauser-Cram et al., 1993). Adult presence, which can

vary across sites, thus can have a profound impact on how children relate to each other and must be accounted for when studying peer interactions.

Of note, adult presence evidenced an interesting pattern of relations with respect to children's EC. Although adult presence in the classroom was significantly negatively related to parent-rated EC and lab EC, it was significantly positively correlated with teacher-rated EC (see Table 4). This finding is surprising, as adult presence in the classroom might be expected to relate negatively to teachers' ratings of children's EC; that is, teachers would be expected to more closely observe children who are dysregulated. This, however, did not seem to be the case, and an alternative explanation was required. As noted in the preceding paragraph and in the introduction, teacher presence changes the nature of children's interactions—they are more teacher oriented, evidence better focus and greater persistence, and evidence less aggression. By being present, teachers engender more regulated behavior from the students, thus explaining the positive association between adult presence and teachers' ratings of EC. Parents, on the other hand, who view their children as dysregulated are potentially more likely to seek a preschool that will provide greater structure and monitoring. Accordingly, parents who see their children as dysregulated register them for preschools that offer more structure, and that structure (i.e., imparted in part by adult presence in the classroom and playground) then scaffolds more regulated behavior, thus potentially explaining the different relations that adult presence has with parents' and teachers' ratings of EC.

The Importance of Similarities between Children and their Peers

Many modest to moderate associations were found amongst children's characteristics and the same characteristic in their peers (i.e., the average score for the three, or fewer, peers in children's peer contexts). Children and their peers had significant positive associations on all three indicators for the constructs representing anger and aggressive behavior. Significant associations for two of three indicators (the third relation being nonsignificant) were observed for EC, social competence, sadness, and positive peer behavior. Only one variable, namely parent-rated shyness, evidenced a significant negative relation; this is of particular interest given the significant positive association between children and peers' teacher-rated shyness, as well as between their observed reticence scores.

The presence of nonsignificant relations was also potentially informative; for instance, whereas the relations between children's and peers' teacher- and observer-rated sadness were significant, the relation between observed sadness was nonsignificant. Taken together, these results beg the question of whether similarity occurred amongst the children and their peers or only in the perceptions of those evaluating them. Other nonsignificant relations (e.g., a nonsignificant association between children's and their peers' parent-rated EC, when considered in tandem with the significant positive associations found for teacher-rated EC, as well as lab EC) raised further questions about the sources and import of perspectival differences of non-equivalent reporters. Overall, however, the discordant findings were few in number; significant positive correlations were obtained in 15 out of 20 variable pairs. Accordingly, these data might be taken as

evidence of homophily (i.e., the concept that groups form amongst people with similar characteristics; McPherson, Smith-Lovin, & Cook, 2001) in children's peer groups, although it was not possible to distinguish amongst the potential mechanisms underlying the similarities between children and their peer context members—i.e., selection/preference, socialization (e.g., contagion or deviancy training), or alternative processes such as through avoidance and withdrawal; see Dishion et al., 1996; Schaefer, Kornienko, & Fox, 2011; Snyder et al., 2005)—on the basis of these data.

Regardless of which mechanism accounts for the similarities between children and their peers, the presence of significant similarities has implications for future research in this area. In models involving peer characteristics, it might be prudent to include the same characteristics in the child as a control variable for the outcome. For example, given the correlations observed between children's and peers' teacher- and observer-rated sadness, it might be prudent to control for the impact of children's concurrent sadness on their reticent behavior to ensure that the impact of peer context sadness is, in fact, not due to its relation with the children's own sadness. Controlling for earlier sadness and reticent behavior in a longitudinal analysis would provide further evidence of the peer context's impact on children's behavior in that social environment.

Strengths

In addition to helping build the knowledge base regarding the roles that children's peers play in their development, the findings reported herein speak to the importance of considering person-by-environment interactions in predicting

and understanding the behavior of shy children in social settings. Distinctions have been drawn between internal and external bases for children's lack of social play in a peer setting: whereas actively isolated children play alone because their peers rebuff them (i.e., external causes), shy children withdraw as a function of their fears of negative evaluation and anxieties (i.e., internal causes; Coplan & Armer, 2007; Coplan et al., 2004). The results obtained herein suggest that the distinction is not as clear-cut as the aforementioned approach would imply. Although the contribution of internal sources to shy children's social withdrawal is not disputed, the results of the shy model series suggest that the characteristics of children's peer context contribute, over and above children's shyness, to the prevalence of children's observed reticence behavior in that context. Although the reasons for making the internal/external distinction are clear, the presence of significant moderations suggests that reticent behavior is predicted by both internal and external characteristics simultaneously, and that neither the internal nor the external contributions can be properly understood without reference to the other.

The methodological strengths of this research include the use of a multi-trait, multi-method approach in a SEM framework, as well as the first-reported use of latent variable interactions in studying the relations amongst children's characteristics, their peers' characteristics, and the behavior they display in those social contexts. Using latent variables permitted the use of more complex measurement models that involved multiple perspectives in the formation of the constructs, presumably creating better-informed and more externally valid

measures of the traits. Moreover, working within a SEM framework afforded researchers the ability to model measurement error. Unfortunately, however, it was not possible to assess the significance of each simple regression slope within the latent variable interaction framework. Although this is the first test of moderation in a SEM framework using latent variable interactions reported in the developmental literature to date, the overlap between results obtained herein and those reported in the literature are reassuring and lend credence to the results as a whole.

Additionally, defining children's peer context on the basis of the peers with whom they most frequently interacted represents an innovative approach to defining children's social microcosms in larger social contexts. To date, peers have been defined in terms of friends, playmates, teammates, or all the members of a class or school; by defining peer context in terms of contact rather than the valence of the relationship, children's peer contexts are (a) specific to the child but (b) not limited to affiliative ties. In the future, this approach to the measurement of peer context could be used to distinguish between the effects of children's friends, their peer contexts (i.e., as defined herein), and the larger group setting. A more informative approach, however, would be to track the peers' identities and the nature of the interactions, or lack thereof, as part of the observation scans rather than attempt to ascertain it through teachers' and observers' reports.

Limitations and Future Directions

A key limitation of this study is its cross-sectional design; as a consequence, it is not possible to address causal pathways. Accordingly, although causal pathways are implied by the directive paths in the SEMs, these are merely predictive in nature. Of note, however, is that the latent factors representing the different aspects of peer context were generally not related to children's EC and shyness. The only significant relation obtained was between children's EC and peer context anger; the two variables had a negative covariance. The lack of significant associations amongst the independent variables representing the characteristics of the child and the peer context eliminates any alternative models positing direct causal relations between them. Thus, although it is not possible to make any definitive claims about causal pathways on the basis of these data, they are informative in their own right. Future research should include longitudinal models so that the causal relations amongst shyness, peer context characteristics, and children's behavior in social settings such as preschools can be better understood.

Further, the generalizability of these results is somewhat limited. First, as Asendorpf (1990b) and Gazelle (2008) have both contended, the conclusions drawn from these results cannot be generalized to other age groups. Asendorpf noted, for instance, that although he did not find negative outcomes associated with inhibition in his research with preschoolers, negative correlates had been found in children as young as 7 years old. Additionally, generalizability is limited by a characteristic this study shares with many others—the sample was relatively

homogeneous; the participants were predominantly Caucasian and, for the most part, had a moderate to high socioeconomic status (SES; i.e., measured in terms of the family income and parental education). Accordingly, in order to hazard a guess as to how race/ethnicity and SES might impact the constructs and relations involved in these analyses, it was necessary to look to the literature.

Research indicates, for the most part, that SES is positively associated with children's EC. Higher socioeconomic risk (i.e., 8 items measuring family income and maternal characteristics including education) was associated with significantly lower EC scores, although no relation held with delay of gratification (Li-Grining, 2007; cf. Liew et al., 2008, who found that EC was unrelated to SES). In terms of change over time, Wanless, McClelland, Tominey, and Acock (2011) found that preschoolers from low SES families started out the school year with significantly lower self-regulation than did their counterparts from higher-SES families; although they evidenced steeper gains in self-regulation than their counterparts and narrowed the gap, they never closed it.

Results regarding the relation between race/ethnicity and children's EC thus suggest that mean-level differences exist, but there is also evidence that partial measurement invariance holds. Latino preschoolers had marginally higher executive control scores than did European American preschoolers, although no difference was obtained in post hoc analyses amongst preschoolers of Latino, African American, or other races/ethnicities; no differences were observed in a delay of gratification task (Li-Grining, 2007). Partial scalar invariance of EC was found amongst African American, European American, and Hispanic children,

with significant intercept differences evidenced on a subset of measures (see Sulik et al., 2010). In terms of structural invariance, Latino and European American youth evidenced the same patterns of relations between EC and a number of other variables including conduct problems, depressive symptoms, and the quality of family relations (Loukas & Roalson, 2006). Overall, whereas mean-level differences in EC can be expected for children with different racial/ethnic backgrounds, measurement and structural invariance could be expected to hold on the basis of these findings.

The relations between SES and their social competence, on the hand, evidence more mixed results; relations are not consistently found. Maternal education was significantly positively associated with positive sociometric nominations and social competence, and significantly negatively associated with negative sociometric nominations in an urban sample in China, but not a rural Chinese sample (Chen et al., 2009). Mixed results also have been obtained in relation to play: maternal education was not related to children's play behavior (i.e., parallel, associative, cooperative) in Hauser-Cram et al. (1993, in a study involving developmentally delayed children), but significant main effects of SES were found in Rubin et al. (1976). To further muddy the waters, although Rubin et al. found that lower SES children engaged in less social (i.e., associative and cooperative) play than did their middle SES peers, lower SES was associated with greater associative play than was higher SES in Dyer and Moneta (2006).

Shyness, in turn, has been found to have nonsignificant relations with both SES (e.g., Coplan & Armer, 2005, using maternal education) and race/ethnicity

(Cowden, 2005; Gazelle, 2006). It is not clear, however, whether measurement invariance holds as, unfortunately, the studies that had more diverse samples did not assess this issue directly. Moreover, little research has been done on structural invariance in terms of the relations between shyness and its correlates, including reticent behavior. Although limited in scope, there is evidence that having a shared language is unrelated to shyness in at least some children; in Howes et al. (2011), having peers who did or did not speak Spanish had a nonsignificant relation with peer-rated shyness and observed anxious/fearful behavior in Spanish-speaking children.

Based on these limited results, very little can be said about what systematic relations would be expected to hold based on sociodemographic variables. For instance, it seems reasonable to assume that only partial measurement invariance would be expected to hold for children's EC, but it is not clear whether EC would relate differentially to children's social competence as a function of race/ethnicity and SES. Further, little is known about the measurement invariance of social competence and shyness, although the latter appears unrelated to race/ethnicity and SES. Moreover, although the correlates of shyness have been studied in multiple cultures, it is not clear whether sociodemographic differences within a single culture would impact these associations; this seems possible, however, given that shyness has been observed to have more detrimental impacts on boys than girls--for example, cultures that value an outspoken character might be more critical of people with reticent natures. Accordingly, research that directly addresses the issues of structural and

measurement invariance on the basis of race/ethnicity and SES is required before any claims can be justifiably made.

Conclusions

In summary, peer context anger and EC, albeit with unexpected results, interacted with children's own characteristics to predict their behavior in a social setting in both the EC and shy model series. The relation between shyness and reticent behavior, however, evidenced the greatest impact of peer context; not only were significant interactions obtained in all five models, shy children evidenced sensitivity to even the compressed range of relatively mild levels of peer context sadness and aggression. Children's peer contexts thus serve not only as contexts for development, their characteristics can interact with children's to predict behavior in that context and, potentially, the stability and outcomes associated with the children's own characteristics. As noted earlier, some caveats are warranted. In contrast to the shy models, the peer context characteristics tested herein had only a limited effect in the EC models; further study using a larger sample with a broader range of sadness and aggression scores is warranted before definitive conclusions can be drawn. Additionally, given the associations found between lab EC and teacher-rated laughter, it was not possible to draw conclusions about the role of peer context EC on children's behavior; further research is required to better understand what role, if any, is played by peers' EC.

Hastings et al. (2005) posited that "individual trajectories of development might be shaped as strongly by life experiences as by dispositional traits" (p. 485). One of those life experiences appears to be children's experiences with

their peers. Although it is beyond the scope of this thesis to quantify such claims, it is easy to see how repeated exposure to a social environment that exacerbates shy children's proclivities to withdraw could shape their long-term development. Sensitivity to threat and a proclivity to withdraw in response to perceived threat might have important implications for children's academic and social success—shy children in adverse environments might suffer both scholastically (e.g., due to an inability to shift attention away from negative stimuli to the task at hand) and socially (e.g., a propensity to withdraw might reduce children's opportunities for play and friendship). In response to the questions posed at the outset, these results enable us to answer that: (a) peers' anger and EC, perhaps sociability, have the broadest impact of the peer characteristics examined in these analyses; and, (b) the relations between preschoolers' shyness and reticent behavior are impacted more by environmental variations than are the relations between preschoolers' EC and social competence. To the overarching question of whether peer contexts moderate the relations between children's characteristics and their behavior, these data suggest that social behavior in a given setting is, indeed, a function of the characteristics of both children and their peers.

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Table 1

Means and Standard Deviations of Child Characteristics

Child variable	Whole sample (<i>n</i> = 132, 54 girls)		Site 1 (<i>n</i> = 50, 18 girls)		Site 2 (<i>n</i> = 55, 23 girls)		Site 3 (<i>n</i> = 27, 13 girls)		<i>F</i>	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Teacher-rated EC	4.96	0.91	5.06	0.99	4.85	0.93	4.92	0.70	0.68	2, 124
Parent-rated EC	4.74	0.54	4.61	0.60	4.78	0.49	4.77	0.56	1.12	2, 100
Lab EC	-0.03	0.78	-0.15	0.85	-0.05	0.76	0.21	0.68	1.69	2, 116
Teacher-rated popularity	3.33	0.73	3.23	0.77	3.43	0.65	3.29	0.80	1.03	2, 124
Peer-rated liking	0.01	0.97	0.03	0.99	-0.03	0.95	0.08	1.01	0.12	2, 113
Observed peer-oriented play	0.53	0.13	0.49 _a	0.12	0.58 _b	0.14	0.51 _a	0.12	7.64 ^{**}	2, 126
Teacher-rated shyness	3.13	1.30	2.90 _a	1.45	3.10 _{a,b}	1.27	3.63 _b	0.95	2.72 [†]	2, 124
Parent-rated shyness	3.68	1.26	3.44	1.40	3.73	1.19	3.94	1.20	1.04	2, 100
Observed reticent behavior	0.13	0.06	0.09 _a	0.03	0.15 _b	0.07	0.15 _b	0.05	17.41 ^{***}	2, 126
Age	52.19	7.85	50.70	7.13	52.33	8.60	54.42	6.42	1.88	2, 121
Verbal ability	19.96	5.05	19.89	5.59	19.50	5.02	21.04	3.94	0.79	2, 120
Hours per week	21.09	12.65	8.31 _a	1.75	25.35 _b	9.50	36.11 _c	5.11	172.53 ^{***}	2, 129
Adult presence	.50	.15	.64 _a	.08	.37 _b	.11	.48 _c	.06	117.16 ^{***}	2, 128

Note. Means with different subscripts differ significantly ($p < .05$ or better); Tukey's HSD was used to test for post hoc differences.

[†] $p < .10$. ^{**} $p < .01$. ^{***} $p < .001$.

Table 2

Means and Standard Deviations of Peer Context Characteristics

Peer context variable	Whole sample		Site 1		Site 2		Site 3		<i>F</i>	<i>df</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Teacher-rated EC	5.02	0.64	5.16	0.68	4.91	0.67	4.97	0.43	2.10	2, 126
Parent-rated EC	4.76	0.39	4.64 _a	0.43	4.86 _b	0.31	4.78 _{a,b}	0.40	4.24 [*]	2, 122
Lab EC	0.03	0.57	-0.23 _a	0.71	0.10 _b	0.43	0.38 _b	0.16	12.10 ^{***}	2, 122
Peer-rated anger	-0.05	0.60	0.00	0.58	-0.04	0.67	-0.18	0.47	0.72	2, 118
Teacher-rated anger	2.47	0.94	1.85 _a	0.68	2.72 _b	0.90	3.18 _c	0.73	28.54 ^{***}	2, 126
Observer-rated anger	2.94	0.59	2.96 _a	0.53	3.11 _a	0.65	2.55 _b	0.35	8.88 ^{***}	2, 126
Teacher-rated sadness	2.94	0.92	2.05 _a	0.72	3.50 _b	0.49	3.49 _b	0.56	88.40 ^{***}	2, 126
Observer-rated sadness	3.35	0.41	3.32 _a	0.45	3.52 _a	0.32	3.07 _b	0.32	12.48 ^{***}	2, 126
Observed sadness	0.02	0.02	0.01 _a	0.01	0.02 _b	0.02	0.01 _a	0.01	6.99 ^{**}	2, 127
Teacher-rated externalizing	1.46	0.41	1.16 _a	0.12	1.58 _b	0.46	1.81 _c	0.27	40.35 ^{***}	2, 126
Observer-rated externalizing	1.39	0.29	1.28 _a	0.18	1.60 _b	0.32	1.19 _a	0.09	34.71 ^{***}	2, 126
Observed aggression	0.00	0.01	0.00 _a	0.00	0.01 _b	0.01	0.00 _a	0.00	18.76 ^{**}	2, 127
Peer-oriented play	0.56	0.09	0.51 _a	0.08	0.62 _b	0.07	0.53 _a	0.06	30.36 ^{***}	2, 127
Peer-rated helpful	0.18	0.57	0.28	0.65	0.13	0.52	0.12	0.52	0.98	2, 118
Teacher-rated laughter	5.76	0.88	5.30 _a	1.06	5.92 _b	0.63	6.33 _b	0.34	16.64 ^{***}	2, 126

Note. A child's peer context refers herein to the two to three peers with whom a child most frequently interacts at preschool; their average score on the variables of interest constitute the child's peer context. Means with different subscripts differ significantly ($p < .05$ or better); Tukey's HSD was used to test for post hoc differences.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3

Correlations amongst Child Characteristics

Child variable	1	2	3	4	5	6	7	8	9
1 Teacher-rated EC	--	.38***	.40***	.22*	.26**	.19*	-.09	-.02	.04
2 Parent-rated EC	.44***	--	.31***	.15	.37***	.22*	-.09	-.10	-.19†
3 Lab EC	.44***	.37***	--	.32**	.38**	.25**	-.03	-.07	-.07
4 Teacher-rated popularity	.28**	.23*	.29**	--	.32**	.44***	-.29**	-.09	-.19*
5 Peer-rated liking	.40***	.44***	.50***	.36***	--	.25**	-.16†	-.26*	-.21*
6 Observed peer-oriented play	.17†	.25**	.31**	.43***	.26**	--	-.17†	-.13	-.55***
7 Teacher-rated shyness	-.15†	-.11	-.08	-.29**	-.22*	-.15†	--	.41***	.31**
8 Parent-rated shyness	.01	-.06	-.05	-.05	-.19†	-.07	.37***	--	.27**
9 Observed reticent behavior	-.05	-.12	-.14	-.10	-.23*	-.35***	.32***	.28**	--
10 Gender	.31***	.29**	.07	.27**	.28**	-.03	-.09	.06	.07
11 Age	.21*	.12	.47***	.04	.33***	.23*	-.13	.10	-.13
12 Verbal ability	.20*	.21*	.49***	.06	.30**	.08	-.04	-.09	-.16†
13 Hours per week	-.11	.13	.14	.09	.02	.18*	.06	.13	.28**
14 Site1	.10	-.15	-.11	-.11	.01	-.26**	-.14	-.13	-.47***
15 Site2	-.09	.10	-.02	.12	-.04	.32***	-.02	.04	.31***
16 Adult presence	.10	-.14	-.06	-.13	.03	-.31**	-.08	-.10	-.44***

Note. Zero-order correlations are listed below the diagonal; the correlations after controlling for gender, age, verbal ability, and adult presence are provided above the diagonal. Correlations with site variables represent the degree to which those variables are associated with that site rather than the referent group, i.e., site 3. *ns* = 94 to 129 (88 to 113 for correlations with control variables).

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4

Correlations amongst Peer Context Characteristics

Peer context variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Teacher-rated EC	--	.38***	.31**	-.45***	-.61***	-.37***	-.50***	-.08	-.07	-.41***	-.25**	-.34***	.30**	.22*	.32***
2 Parent-rated EC	.36***	--	.42***	-.19†	-.09	-.18*	-.01	.03	-.08	-.10	.00	.05	.02	-.05	-.05
3 Lab EC	.33***	.49***	--	-.13	-.01	-.24*	.04	-.19*	-.18†	-.01	-.23*	-.28**	-.03	.10	.47***
4 Peer-rated anger	-.51***	-.23*	-.21*	--	.38***	.38***	.06	.06	.05	.45***	.34***	.42***	.15	.26**	-.17†
5 Teacher-rated anger	-.62***	.01	.09	.34***	--	.21*	.69***	.09	.08	.68***	.20*	.39***	-.26**	-.08	.01
6 Observer-rated anger	-.44***	-.19*	-.26**	.45***	.25**	--	.14	.72***	.18†	.16†	.76***	.46***	.12	.08	-.27**
7 Teacher-rated sadness	-.42***	.19*	.24**	-.01	.74***	.15†	--	.12	.20*	.35***	.06	.13	-.35***	-.17†	-.09
8 Observer-rated sadness	-.13	.05	-.16†	.06	.16†	.70***	.22*	--	.41***	-.04	.66***	.34***	.27**	-.10	-.15
9 Observed sadness	-.07	.02	-.04	-.06	.17†	.14	.35***	.43***	--	.04	.30**	.22*	.12	-.02	.05
10 Teacher-rated externalizing	-.45***	.03	.14	.43***	.74***	.23**	.53***	.04	.13	--	.18†	.46***	-.17†	-.01	.07
11 Observer-rated externalizing	-.36***	.08	-.09	.37***	.38***	.72***	.34***	.63***	.32***	.42***	--	.69***	.21*	.06	-.26**
12 Observed aggression	-.42***	.11	-.16†	.40***	.50***	.48***	.35***	.37***	.27**	.57***	.76***	--	-.01	.01	-.21*
13 Peer-oriented play	.13	.16†	.18*	.12	.05	.14	.18*	.29**	.23**	.20*	.42***	.22*	--	.35***	.12
14 Peer-rated helpful	.29**	-.03	.14	.16†	-.14	.01	-.18*	-.13	-.03	-.08	-.05	-.09	.21*	--	.13

Peer context variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
15 Teacher-rated laughter	.35***	.14	.61***	-.31**	.11	-.31***	.21*	-.10	.19*	.18*	-.12	-.10	.29**	.16†	--
16 Gender	.30**	.14	.19*	-.50***	-.09	-.26**	.09	.01	.19*	-.24**	-.24**	-.14	-.05	.11	.33***
17 Age	.17†	.16†	.39***	.01	.02	-.08	.07	-.10	-.01	.20*	.06	-.03	.20*	.17†	.31***
18 Verbal ability	.19*	.10	.17†	-.08	-.04	-.08	.06	-.02	.03	-.07	-.15†	-.17†	-.10	.24*	.15
19 Hours per week	-.18*	.13	.33***	-.04	.50***	-.06	.57***	-.04	.16†	.65***	.18*	.22*	.29**	-.12	.39***
20 Site1	.18*	-.24**	-.36***	.06	-.53***	.02	-.76***	-.05	-.23**	-.59***	-.30**	-.29**	-.45***	.13	-.42***
21 Site2	-.15†	.22*	.10	.03	.22*	.25**	.51***	.34***	.31***	.24**	.58***	.48***	.56***	-.08	.15†
22 Adult presence	.18*	-.26**	-.28**	.03	-.44***	-.09	-.72***	-.18*	-.29**	-.49***	-.46***	-.40***	-.54***	.12	-.34***

Note. Peer context variables were calculated as the average score of the 2 to 3 peers in a child's peer context. Zero-order correlations are listed below the diagonal; the correlations after controlling for gender, age, verbal ability, and adult presence are provided above the diagonal. $ns = 117$ to 130 (109 to 113 for correlations with control variables). † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5

Correlations amongst Child Characteristics and Peer Context Characteristics

Peer context:	Child:	Teacher-rated EC	Parent-rated EC	Lab EC	Teacher-rated popularity	Peer-rated liking	Peer-oriented play	Teacher-rated shyness	Parent-rated shyness	Reticent behavior
Teacher-rated EC		.41*** (.28**)	.10 (-.00)	.14 (.02)	.00 (-.08)	.31** (.16†)	.09 (.14)	-.20* (-.14)	-.02 (-.04)	-.07 (.05)
Parent-rated EC		.11 (.04)	.09 (-.01)	.18† (.10)	.01 (-.07)	.18† (.11)	.10 (.00)	-.13 (-.12)	.07 (.03)	.11 (.03)
Lab EC		.11 (-.03)	.25* (.13)	.30** (.13)	.11 (.01)	.15 (-.05)	.07 (-.11)	-.04 (.01)	.12 (.06)	.16† (.13)
Peer-rated anger		-.40*** (-.30**)	-.27** (-.15)	-.14 (-.15)	-.07 (.08)	-.22* (-.09)	-.05 (-.07)	-.05 (-.12)	-.08 (-.04)	-.13 (-.13)
Teacher-rated anger		-.30*** (-.26**)	.10 (.09)	.00 (-.01)	.04 (.02)	-.12 (-.08)	.03 (-.13)	.12 (.08)	.03 (.00)	.28** (.11)
Observer-rated anger		-.29** (-.19*)	-.05 (.03)	-.17† (-.14)	-.05 (.02)	-.14 (-.02)	.09 (.08)	.10 (.05)	-.12 (-.11)	.00 (-.05)
Teacher-rated sadness		-.18* (-.21*)	.18† (.08)	.07 (-.02)	.14 (.06)	.04 (.06)	.13 (-.15)	.18* (.19*)	.09 (.04)	.36*** (.09)
Observer-rated sadness		-.03 (.02)	.06 (.06)	-.13 (-.12)	-.02 (-.04)	-.04 (.00)	.23* (.21*)	.10 (.07)	-.08 (-.08)	.07 (-.03)
Observed sadness		.05 (.04)	.01 (-.09)	-.05 (-.09)	.16† (.09)	.01 (-.03)	.19* (.13)	-.07 (-.09)	-.01 (-.05)	.06 (-.09)
Teacher-rated externalizing		-.24** (-.18†)	.09 (.11)	.02 (-.06)	-.03 (-.04)	-.15 (-.15)	.05 (-.18†)	.06 (.02)	-.01 (-.08)	.24** (.07)

Child:	Teacher-rated EC	Parent-rated EC	Lab EC	Teacher-rated popularity	Peer-rated liking	Peer-oriented play	Teacher-rated shyness	Parent-rated shyness	Reticent behavior
Peer Context:									
Observer-rated externalizing	-.25** (-.14)	.05 (.09)	-.07 (-.06)	-.03 (-.02)	-.16† (-.08)	.23** (.11)	-.03 (-.10)	-.06 (-.12)	.09 (-.15)
Observed aggression	-.25** (-.16†)	.14 (.18†)	-.12 (-.08)	-.02 (-.03)	-.14 (-.05)	.09 (-.03)	-.10 (-.17†)	-.13 (-.19†)	.06 (-.17†)
Peer-oriented play	-.01 (.06)	.07 (.01)	.08 (.04)	.15† (.12)	.03 (.03)	.44*** (.32**)	-.06 (-.11)	-.02 (-.14)	.13 (-.13)
Peer-rated helpful	.11 (.00)	.04 (-.03)	.14 (.00)	.25** (.24**)	.25** (.15)	.03 (.04)	-.25** (-.22*)	-.02 (-.01)	-.05 (.05)
Teacher-rated laughter	.19* (.05)	.17† (-.02)	.22* (.05)	.23** (.12)	.08 (-.16†)	.23** (.10)	-.13 (-.10)	.14 (.07)	.20* (.12)

Note. For each row, zero-order correlations are listed first, and the correlations after controlling for gender, age, verbal ability, and adult presence are provided second, in parentheses. *ns* = 94 to 127 (90 to 123 for correlations with control variables).

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 6

Results of Confirmatory Factor Analyses

Latent variable	Indicator	Unstandardized loading	SE	<i>p</i> value	Standardized loading	SE	<i>p</i> value	R ²
Children's EC								
	Teacher-rated EC	1.00	.00	n/a	.74	.10	< .001	.55
	Parent-rated EC	0.48	.12	< .001	.59	.10	< .001	.35
	Lab EC	0.71	.19	< .001	.61	.10	< .001	.37
Children's social competence								
	Teacher-rated popularity	1.25	.45	.006	.78	.14	< .001	.61
	Peer-rated liking	1.00	.00	n/a	.47	.11	< .001	.22
	Observed peer-oriented play	0.16	.05	.001	.54	.11	< .001	.29
Peer context anger								
	Teacher-rated anger	0.90	.31	.003	.44	.10	< .001	.20
	Observer-rated anger	0.72	.25	.004	.57	.11	< .001	.32
	Peer-rated anger	1.00	.00	n/a	.77	.13	< .001	.60
Peer context EC								
	Teacher-rated EC	1.00	.00	n/a	.49	.09	< .001	.24
	Parent-rated EC	0.94	.25	< .001	.74	.10	< .001	.55
	Lab EC	1.27	.32	< .001	.70	.10	< .001	.49
Positive peer context								
	Peer-oriented play	0.13	.09	.116	.61	.21	.003	.38
	Peer-rated helpful	0.46	.23	.047	.33	.13	.014	.11
	Teacher-rated laughter	1.00	.00	n/a	.47	.16	.005	.22
Peer context sadness								
	Observer-rated sadness	0.54	.16	.001	.51	.11	< .001	.26
	Observed sadness	0.03	.01	.011	.81	.15	< .001	.65
	Teacher-rated sadness	1.00	.00	n/a	.42	.11	< .001	.18

Note. The CFA results for peer context aggression are not listed here; due to a failure to converge, no solution was obtained.

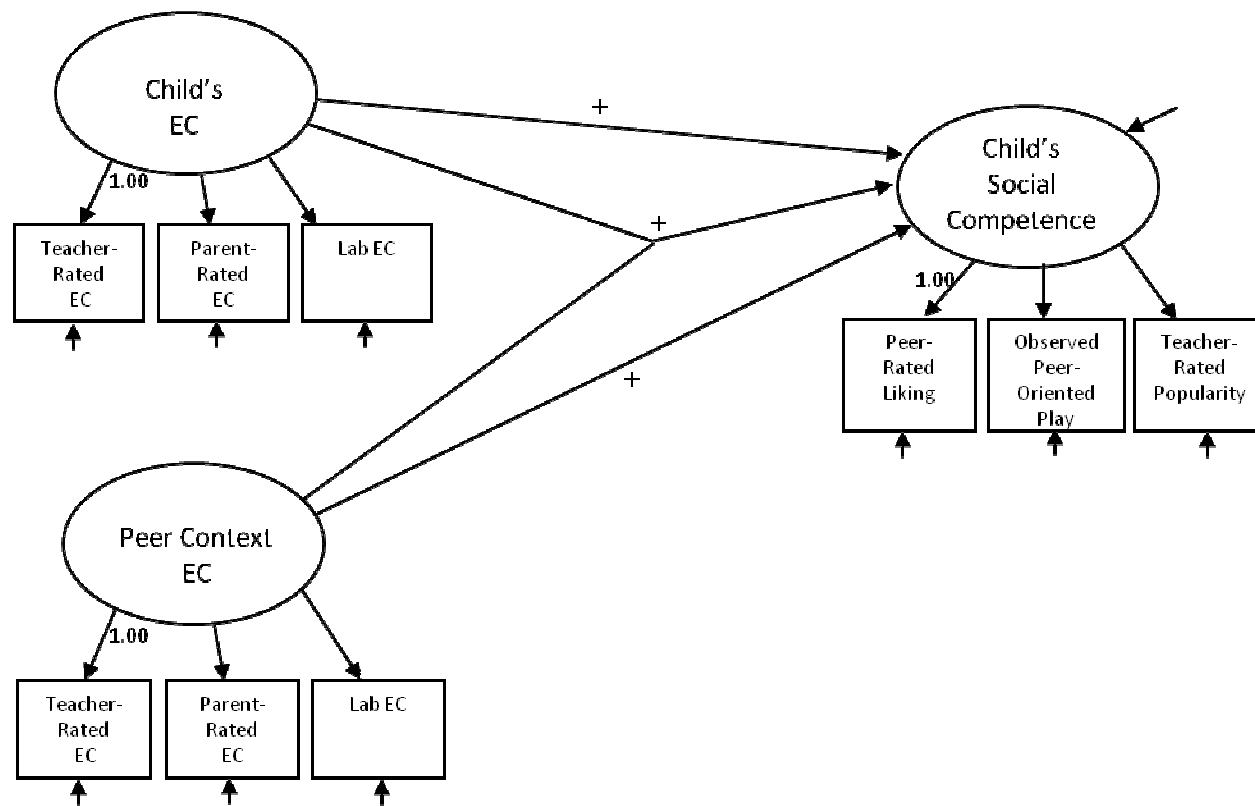


Figure 1. Hypothesized EC model moderated by peer context EC. Control variables were added to each model as appropriate.

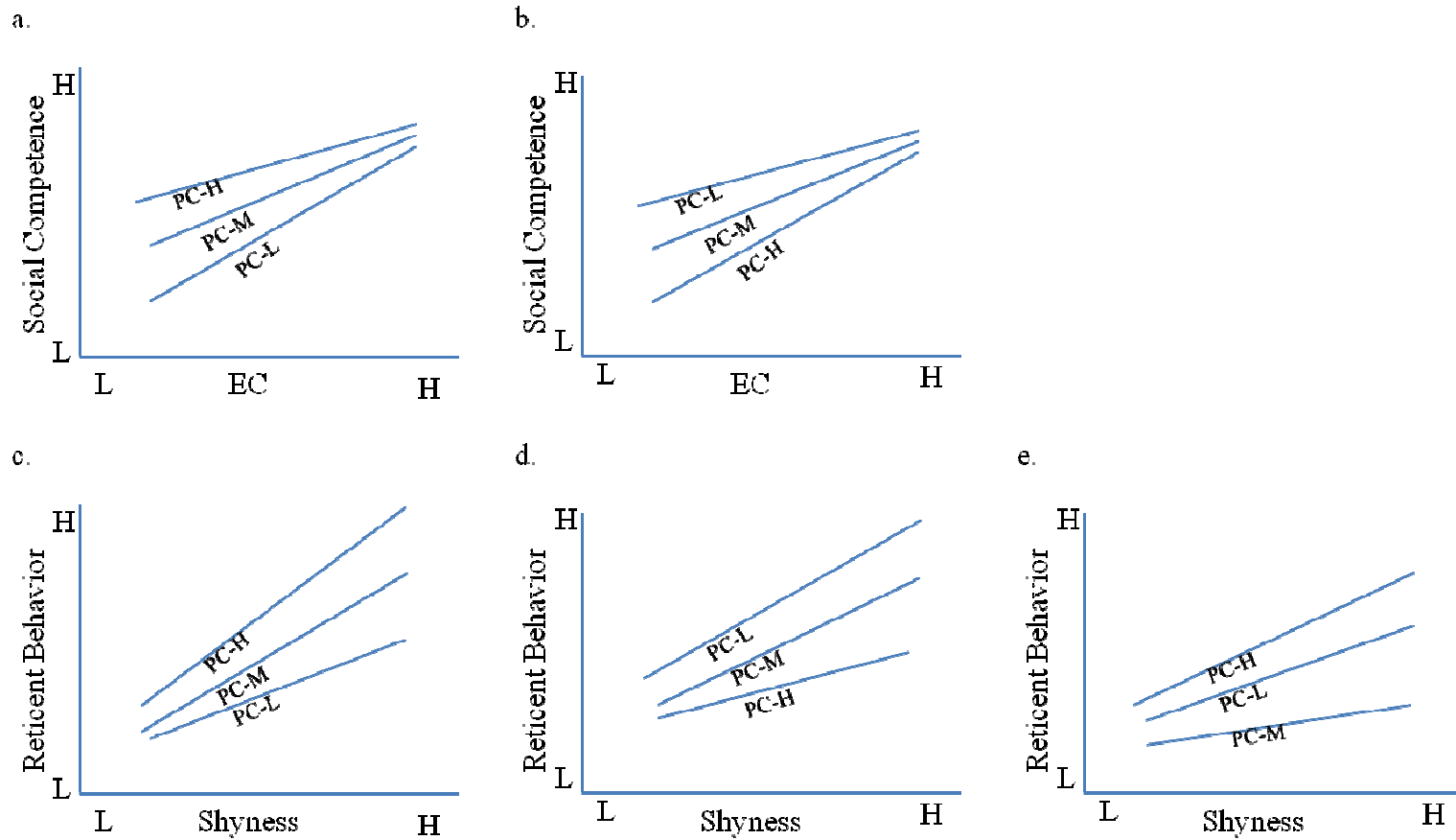


Figure 2. Plots of hypothesized simple regression lines. In plot a, high levels of the peer context variable (labeled PC-H) is associated with the highest scores but the weakest relation between EC and social competence; this plot represents the hypothesized effect of peer context EC and positive peer contexts. Plot b, in turn, represents the hypothesized effect of peer context anger, sadness, and aggression in the EC model series. The remaining three plots relate to the shyness model series and represent the hypothesized effects of: (c) peer context sadness, anger, and aggression; (d) peer context EC; and (e) positive peer contexts.

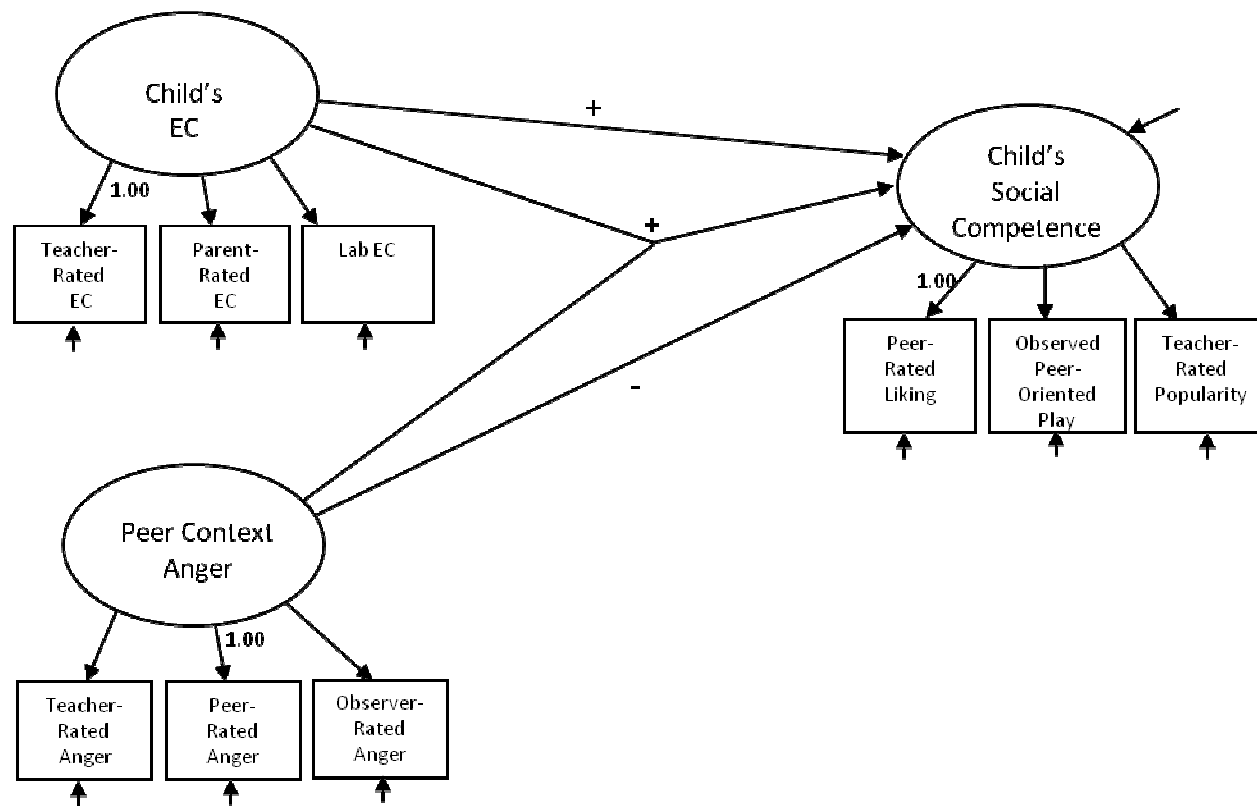


Figure 3. Hypothesized EC model moderated by peer context anger.

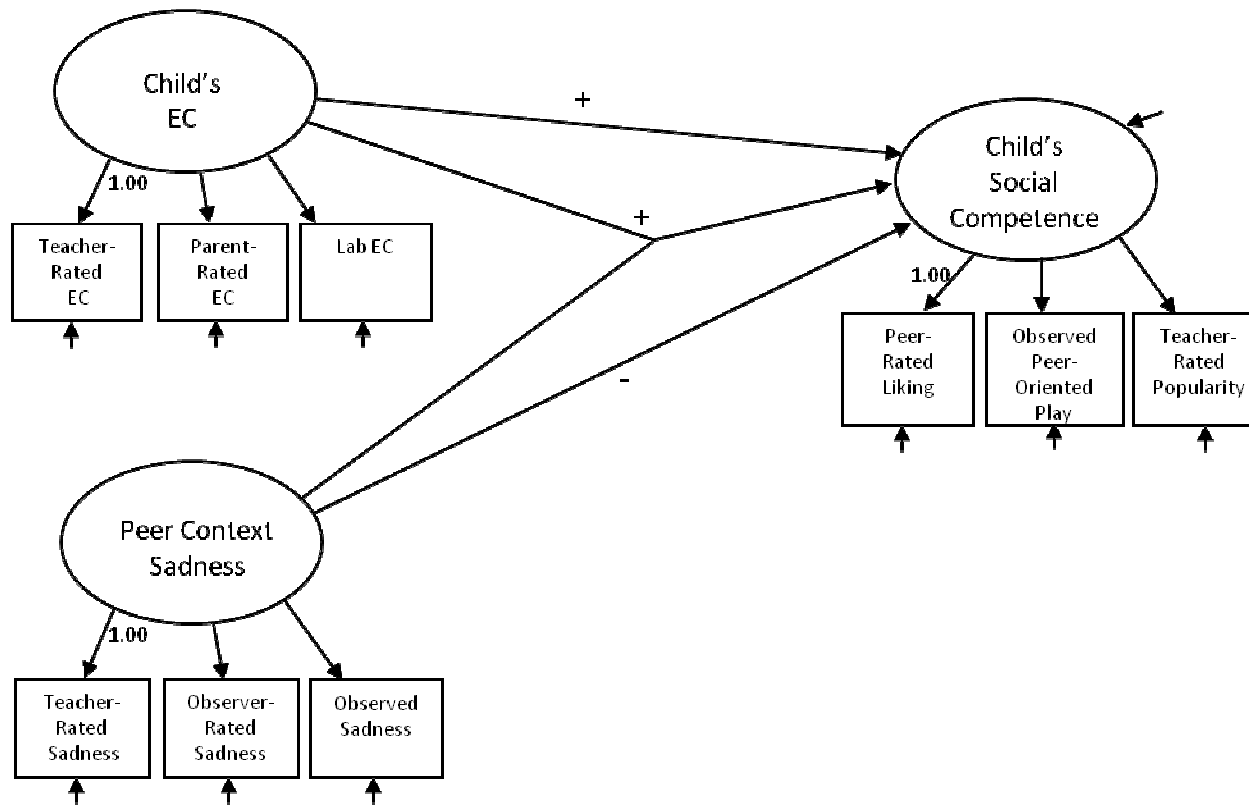


Figure 4. Hypothesized EC model moderated by peer context sadness.

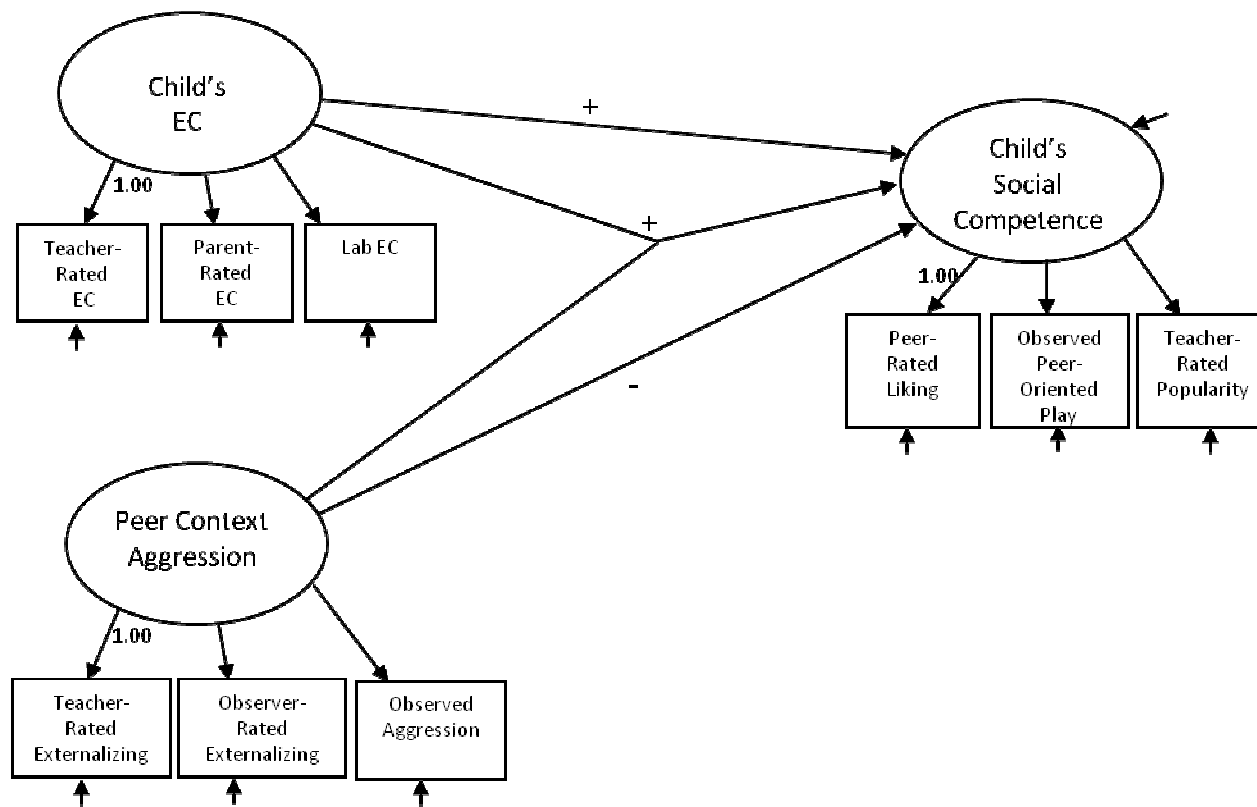


Figure 5. Hypothesized EC model moderated by peer context aggression.

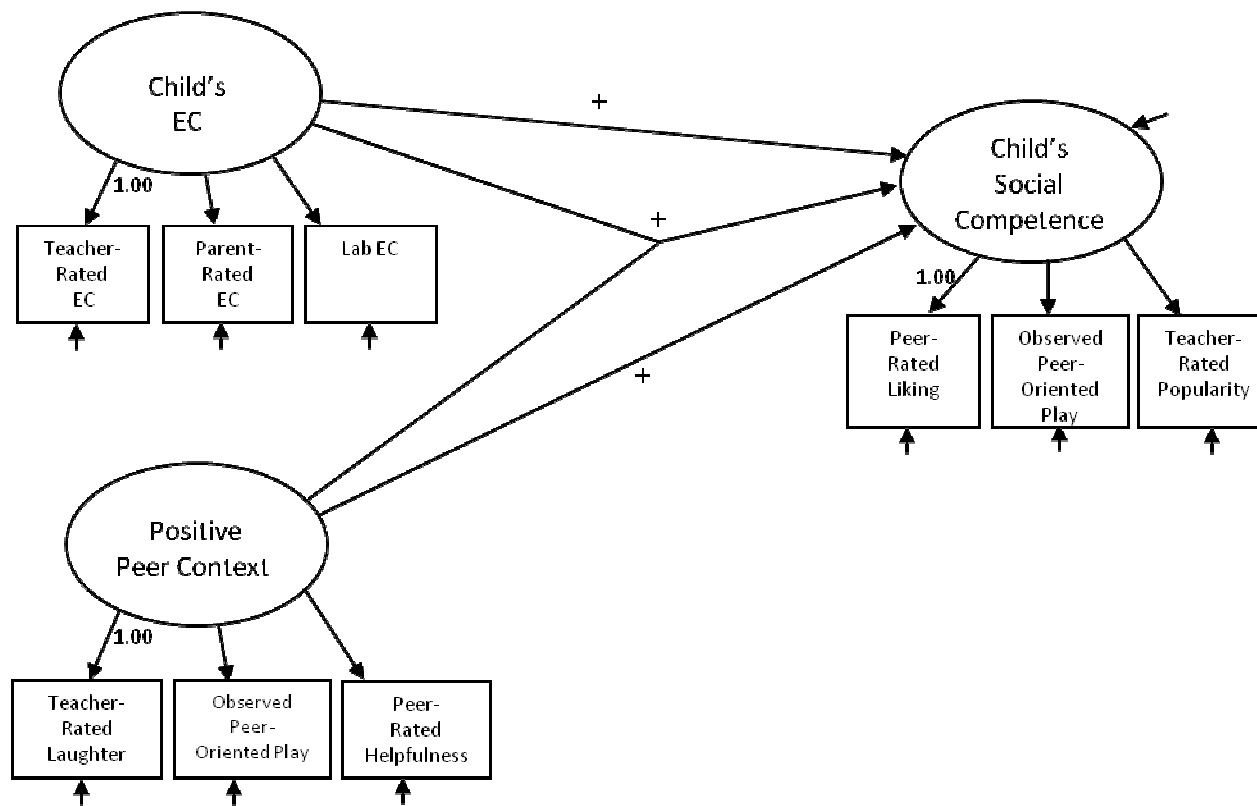


Figure 6. Hypothesized EC model moderated by positive peer context.

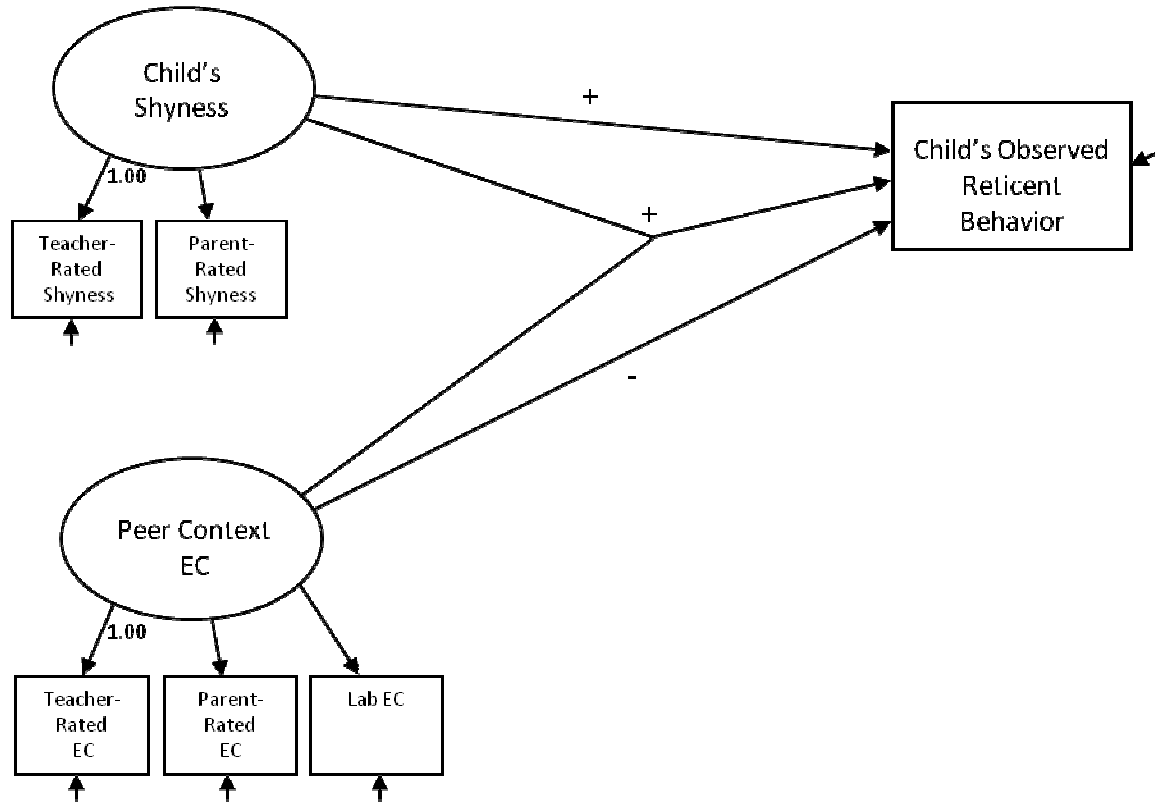


Figure 7. Hypothesized shy model moderated by peer context EC.

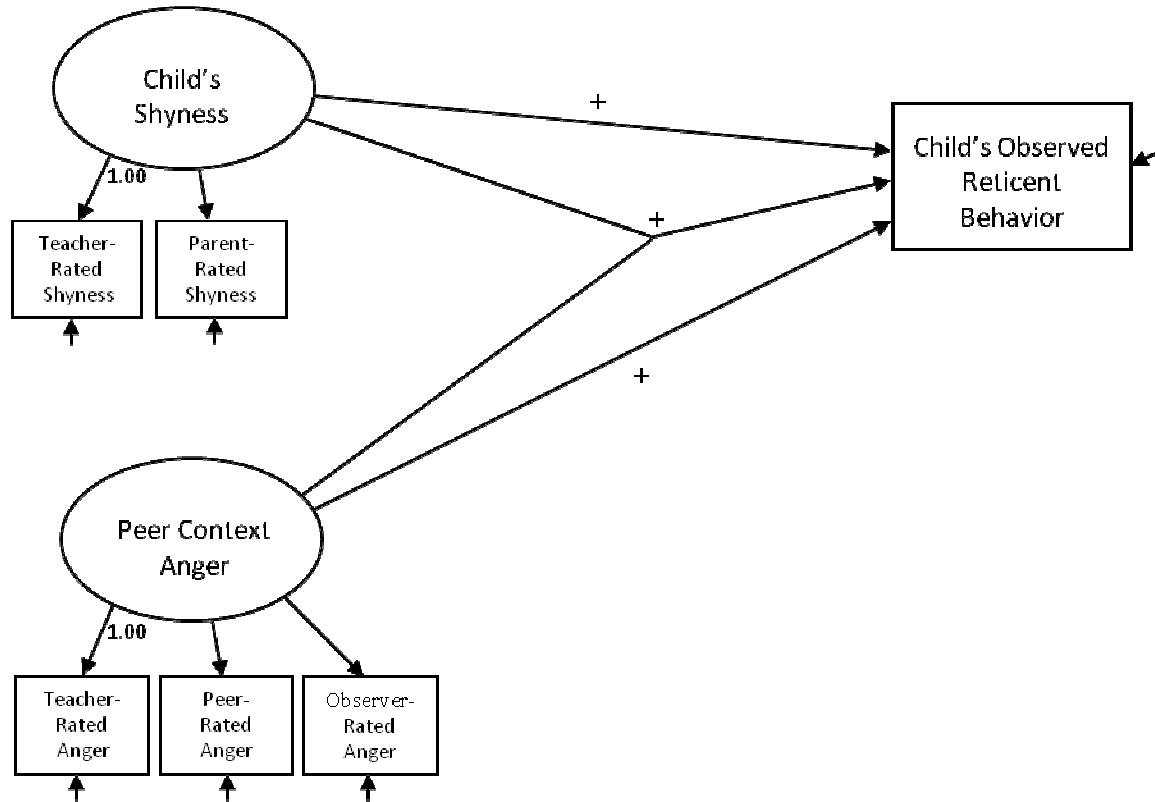


Figure 8. Hypothesized shy model moderated by peer context anger.

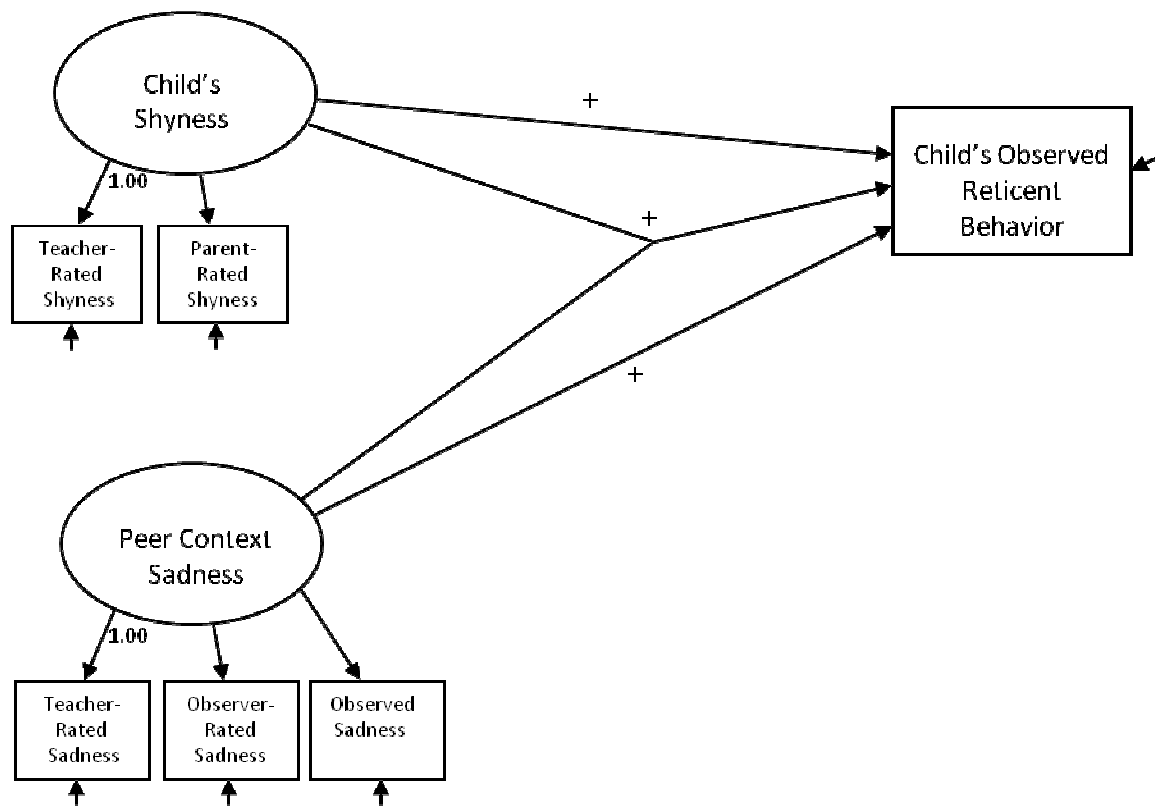


Figure 9. Hypothesized shy model moderated by peer context sadness.

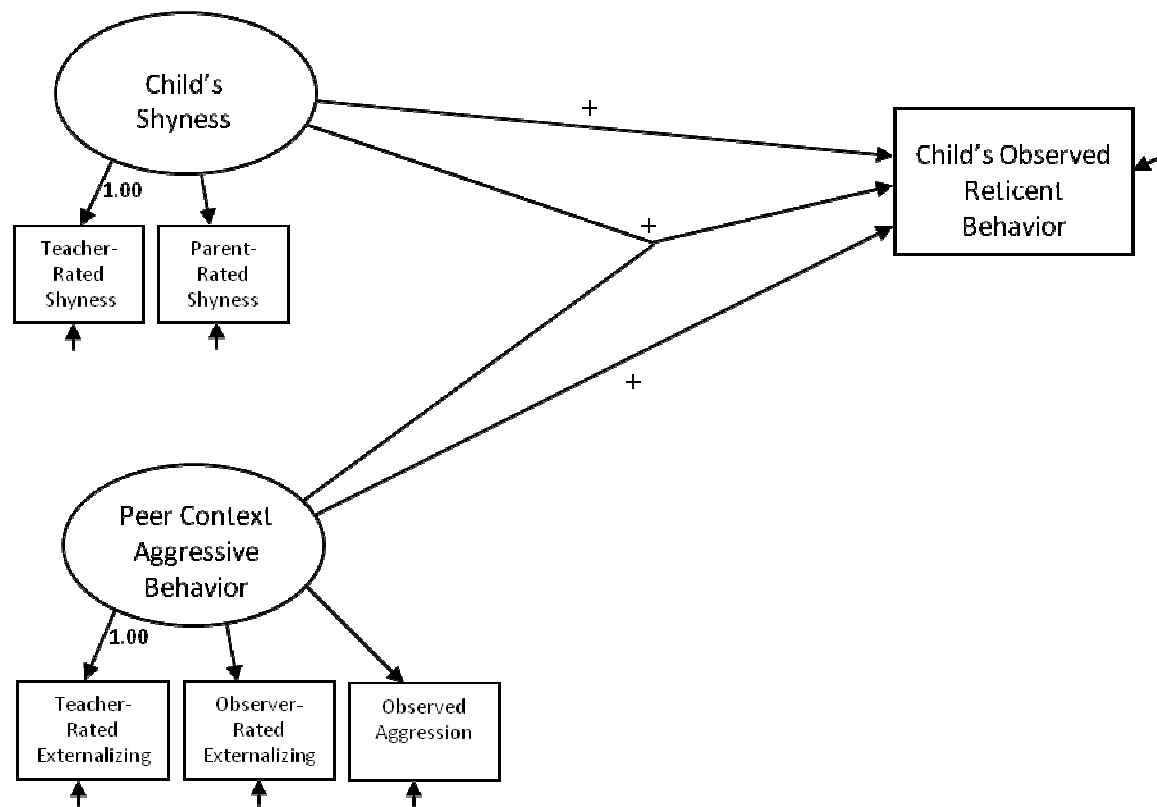


Figure 10. Hypothesized shy model moderated by peer context aggression.

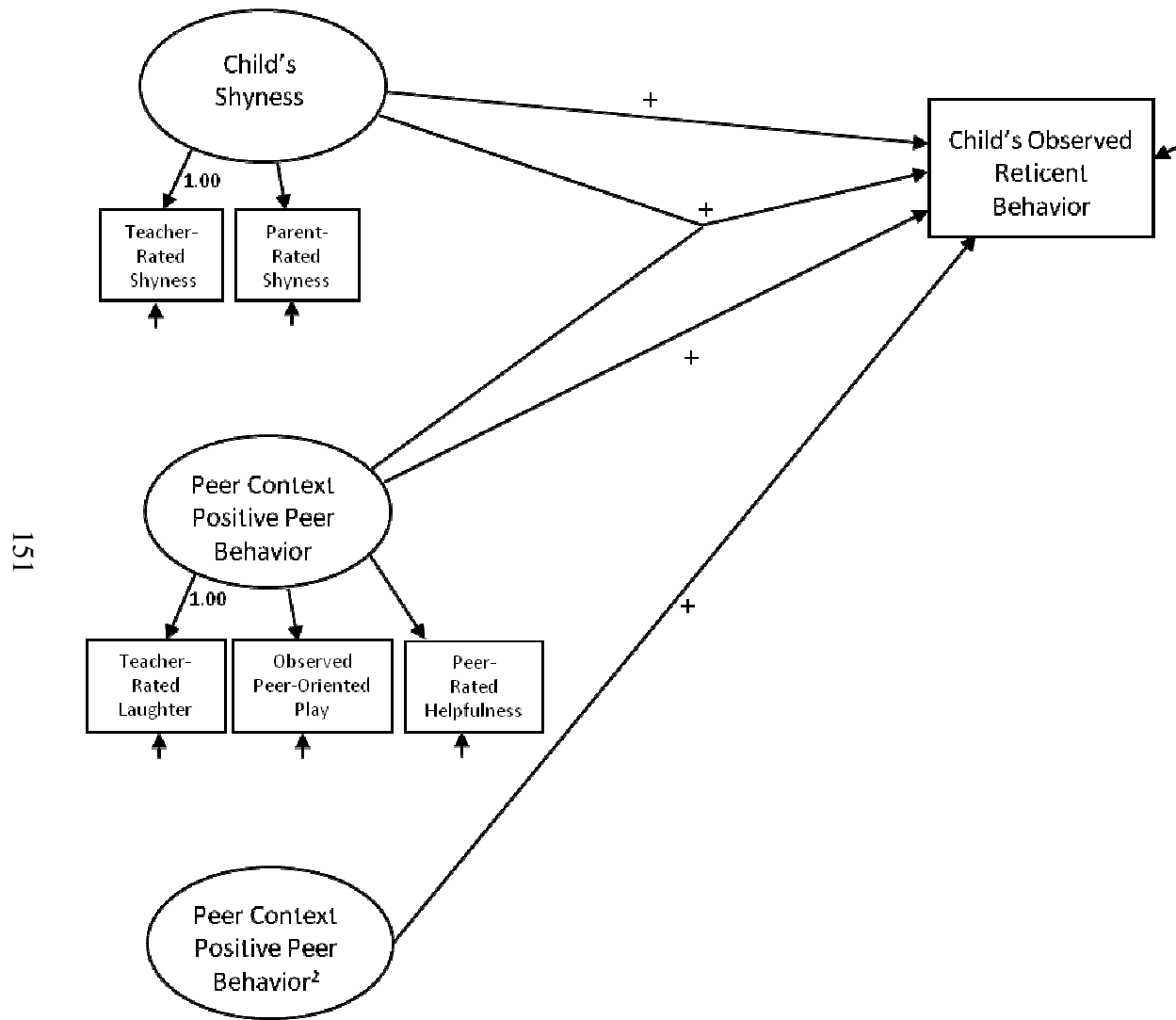


Figure 11. Hypothesized shy model moderated by positive peer context, with a quadratic effect.

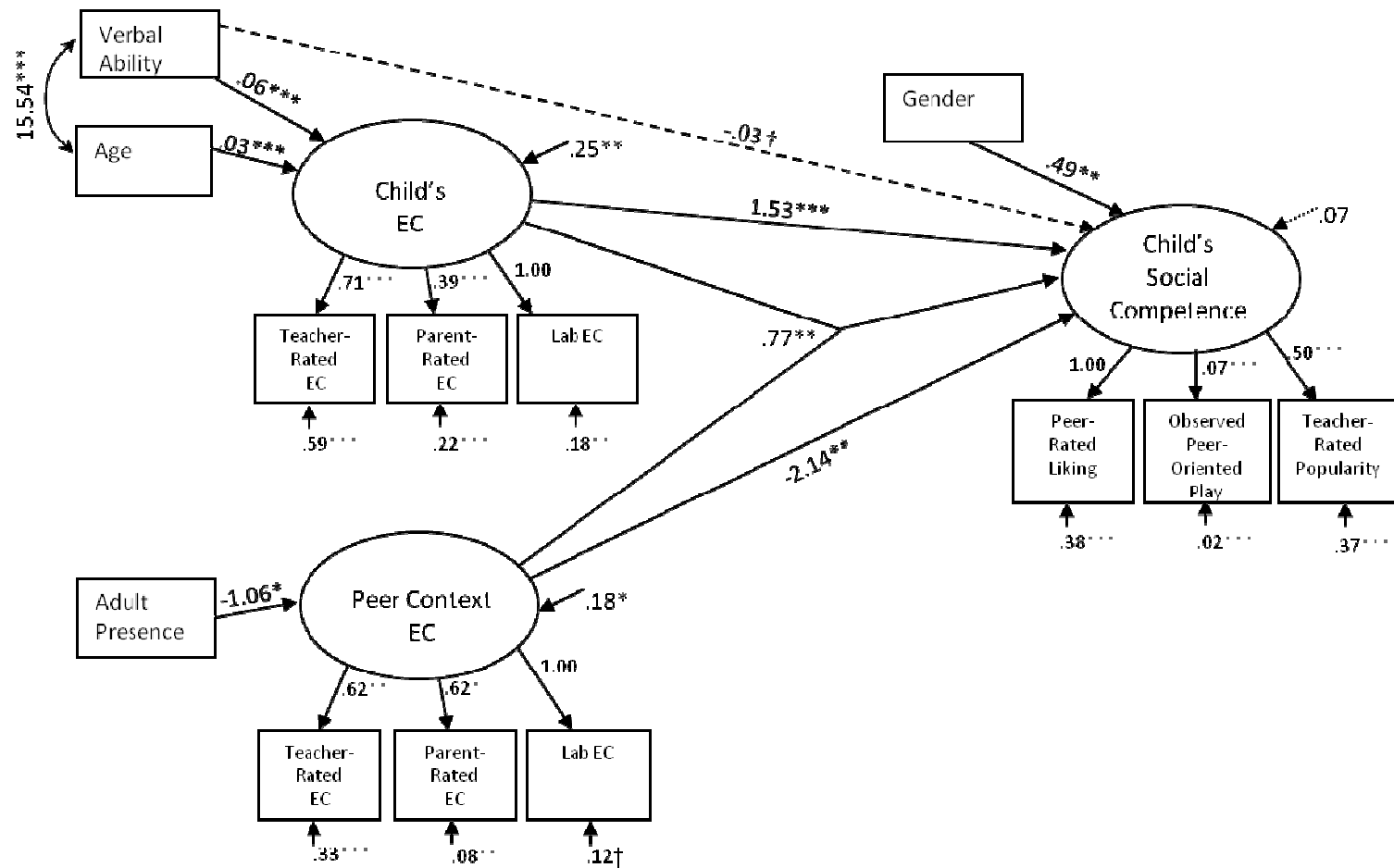


Figure 12. EC model moderated by peer context EC. Solid lines denote statistically significant paths, dashed lines represented marginal paths, and dotted lines denote nonsignificant paths.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

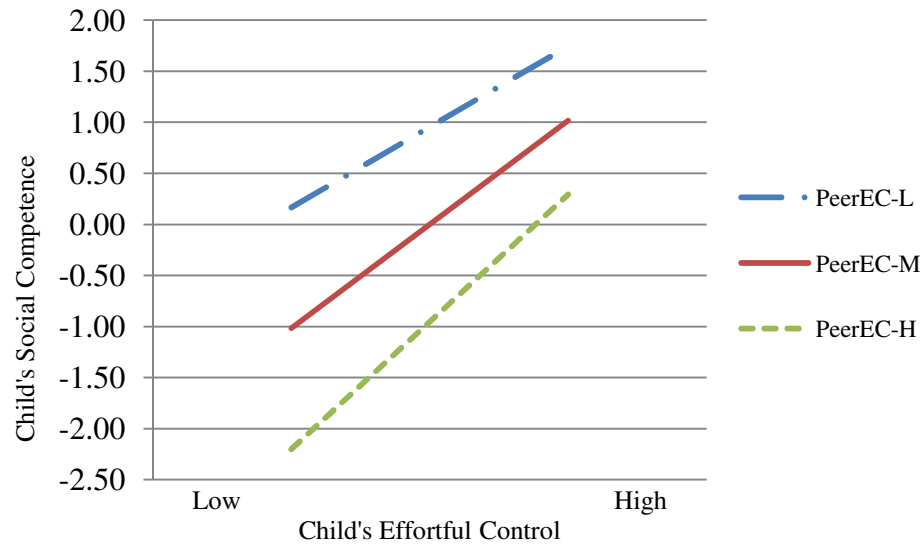


Figure 13. Plot: Social competence predicted by interaction between children's EC and peer context EC. The regression lines represent three levels of the peer context variables: the mean of peer context EC, which was centered at zero (PeerEC-M); 1 *SD* below the mean (PeerEC-L); and 1 *SD* above the mean (PeerEC-H).

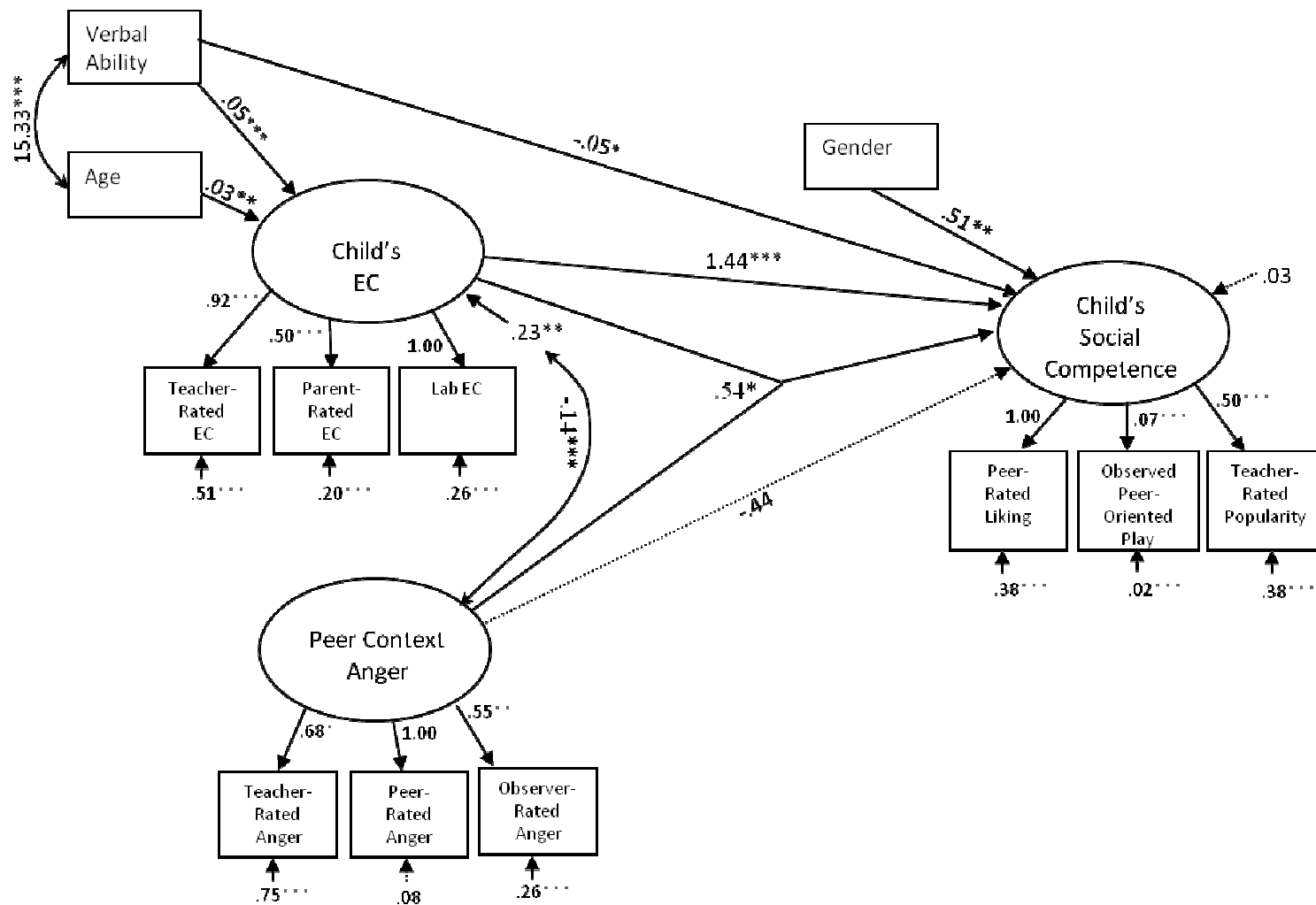


Figure 14. EC model moderated by peer context anger. Solid lines denote statistically significant paths and dotted lines represent nonsignificant paths.

* $p < .05$. ** $p < .01$. *** $p < .001$.

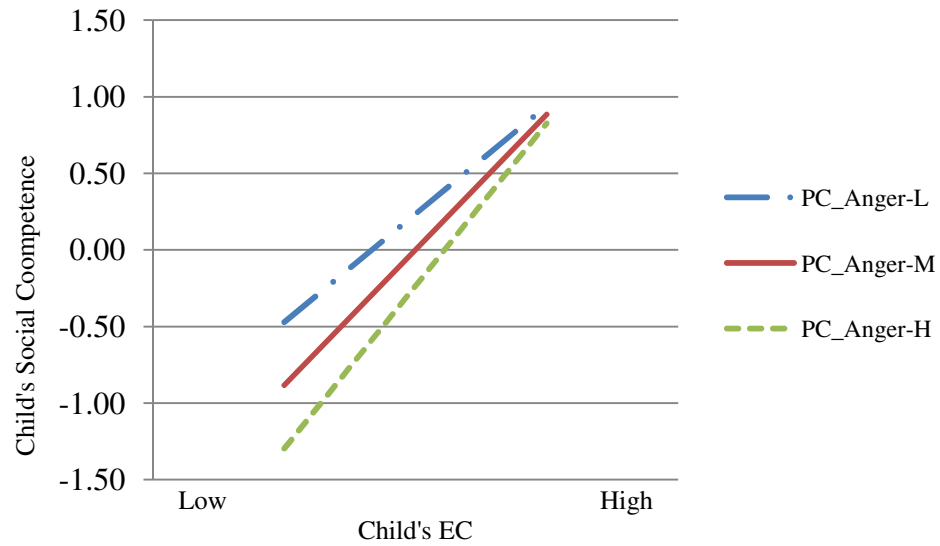


Figure 15. Plot: Social competence predicted by interaction between children's EC and peer context anger. The regression lines represent the mean of peer context anger, which was centered at zero (PC_Anger-M); 1 *SD* below the mean (PC_Anger-L); and 1 *SD* above the mean (PC_Anger-H).

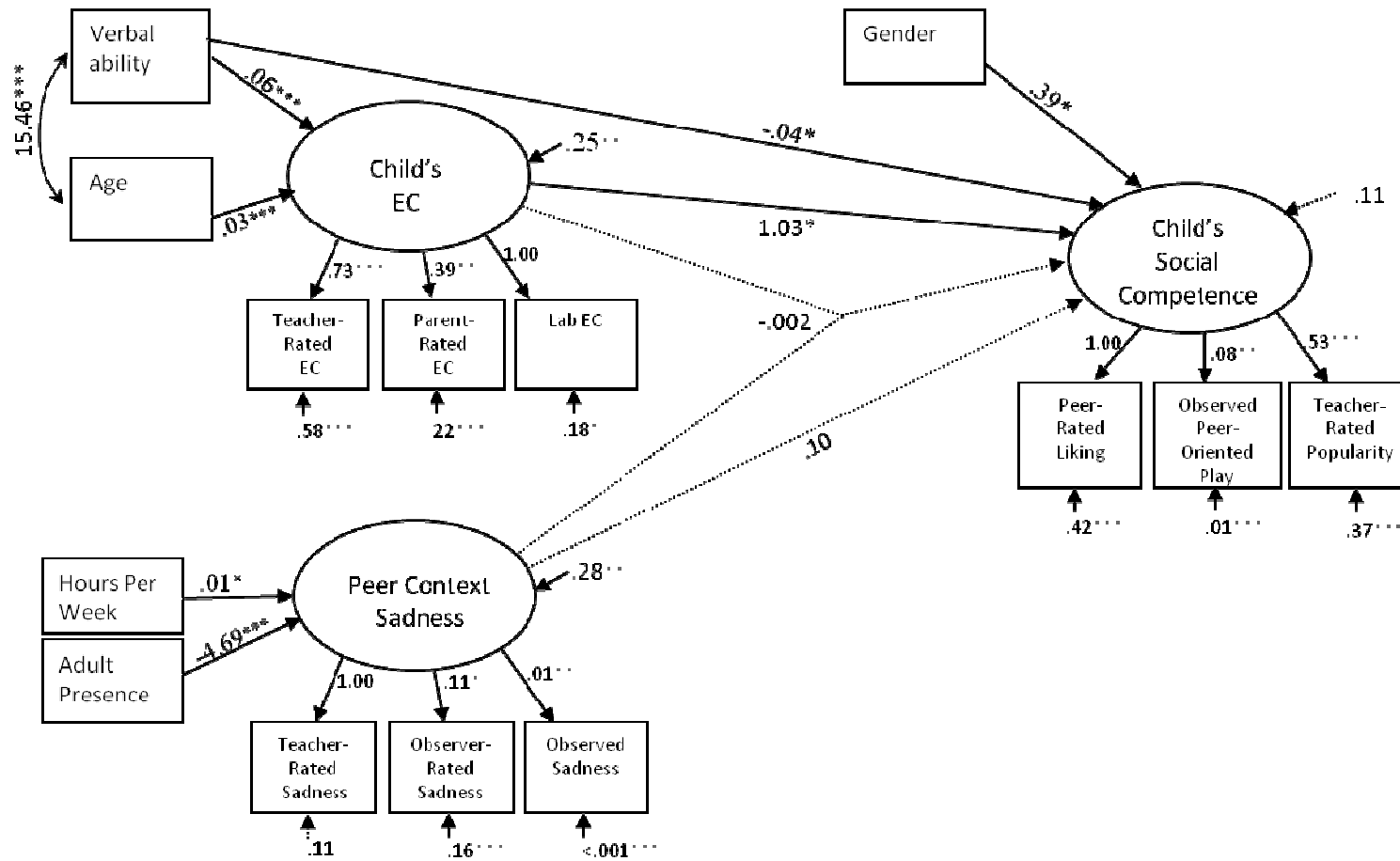


Figure 16. EC model moderated by peer context sadness. Solid lines denote statistically significant paths and dotted lines represent nonsignificant paths.

* $p < .05$. ** $p < .01$. *** $p < .001$.

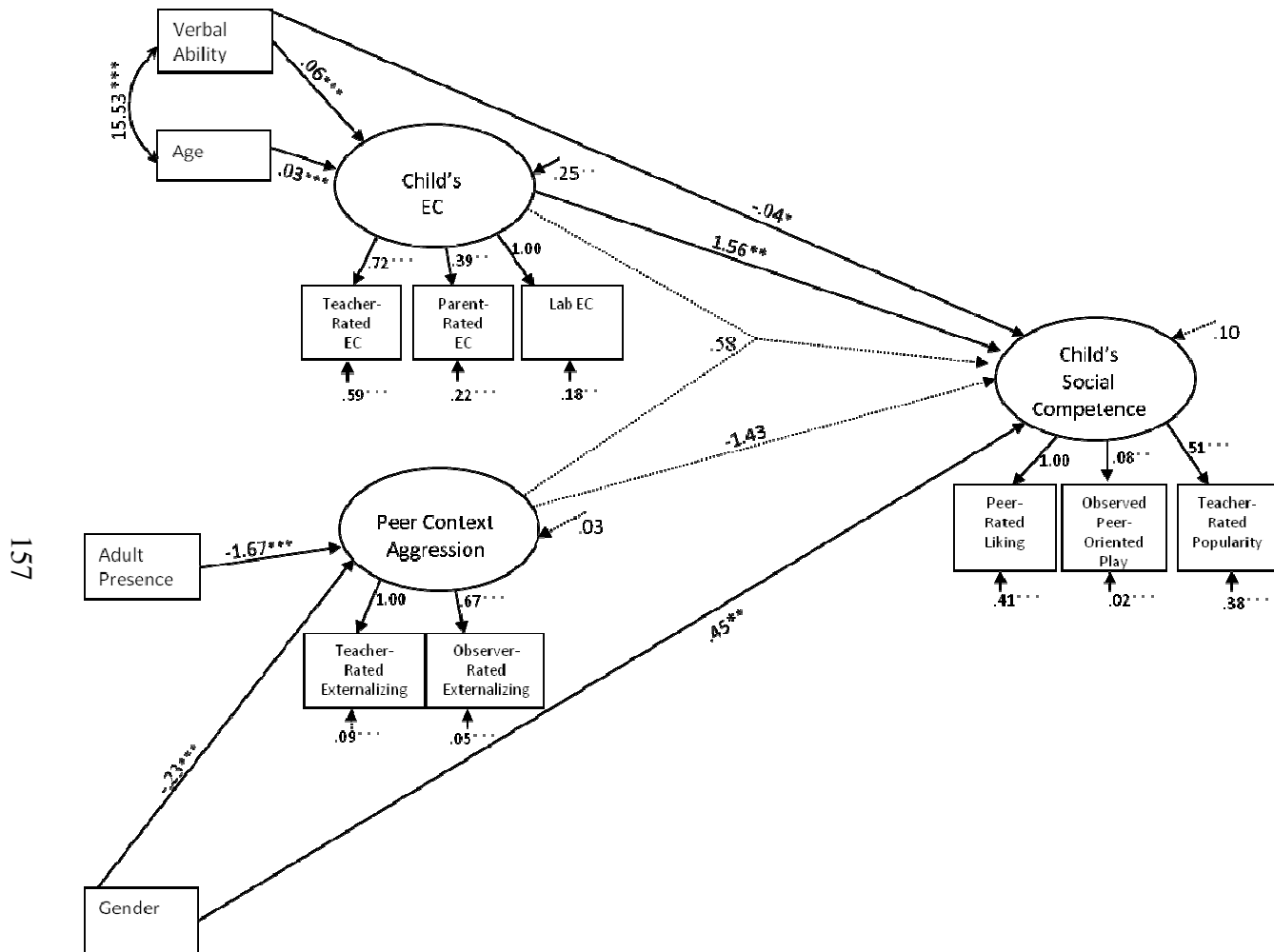


Figure 17. EC model moderated by peer context aggression. Solid lines denote statistically significant paths and dotted lines represent nonsignificant paths.

* $p < .05$. ** $p < .01$. *** $p < .001$.

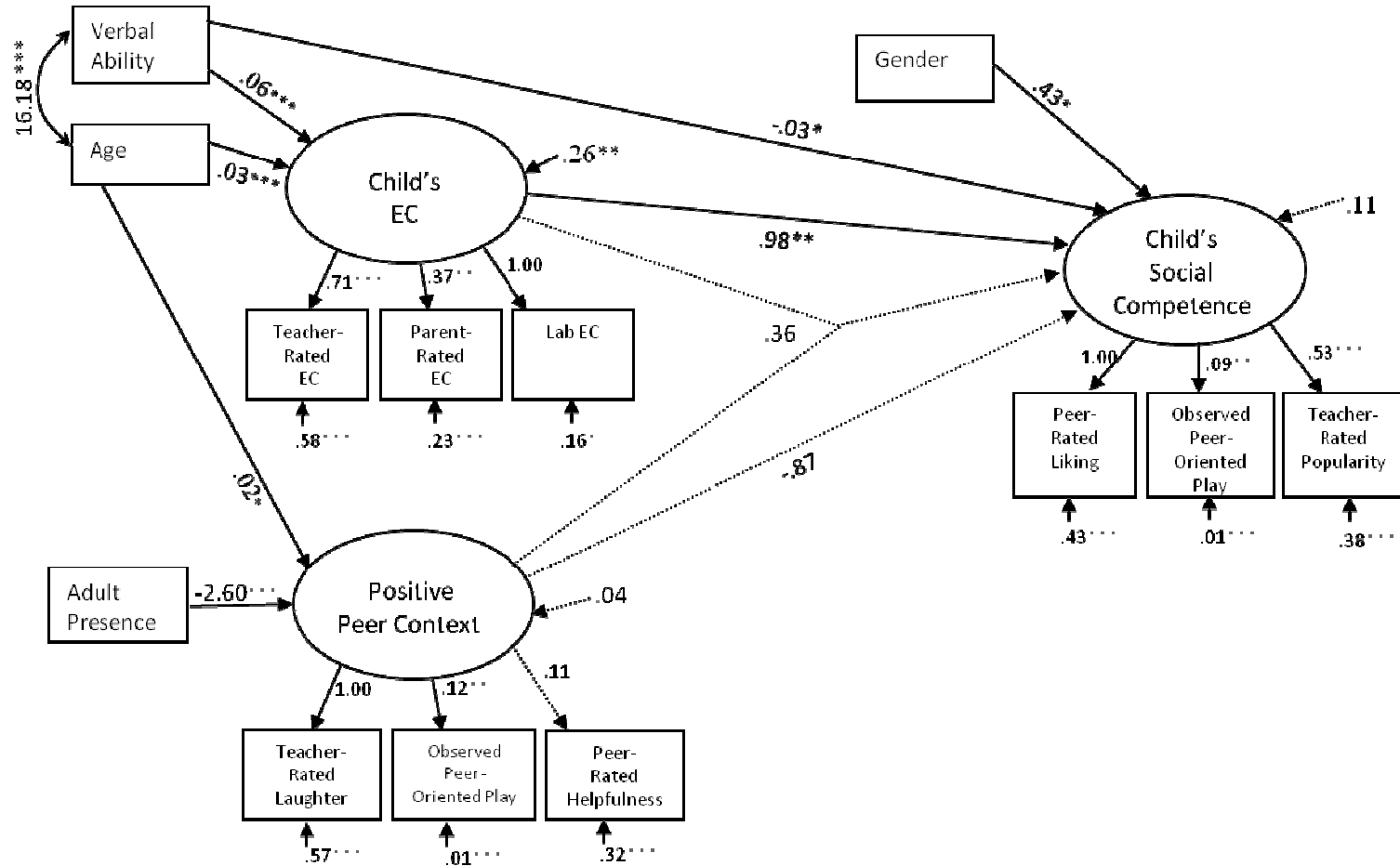


Figure 18. EC model moderated by positive peer context. Solid lines denote statistically significant paths and dotted lines represent nonsignificant paths.

* $p < .05$. ** $p < .01$. *** $p < .001$.

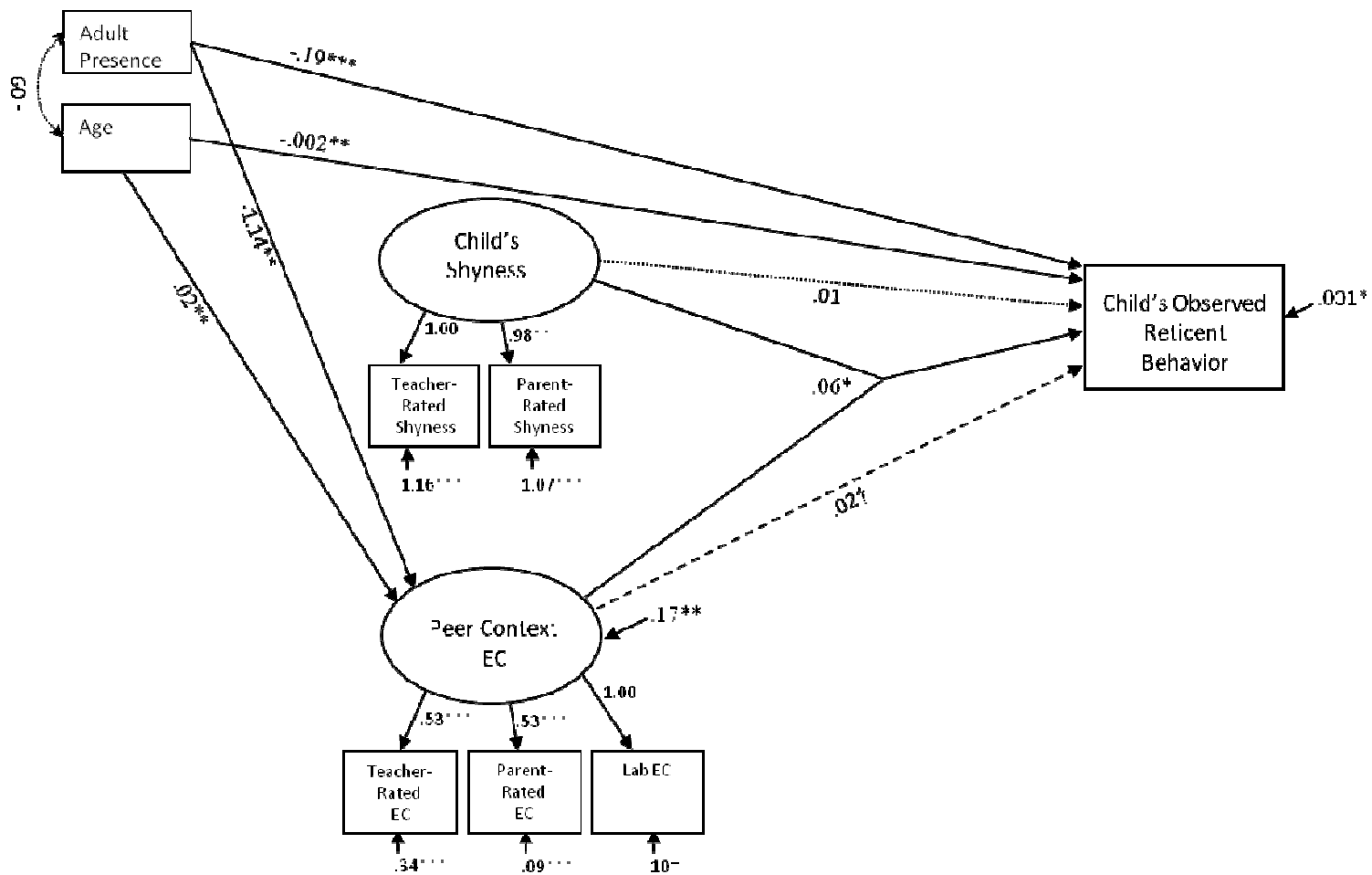


Figure 19. Shy model moderated by peer context EC. Solid lines denote statistically significant paths, dashed lines represent marginal paths, and dotted lines represent nonsignificant paths.

$\dagger p < .10$. $* p < .05$. $** p < .01$. $*** p < .001$.

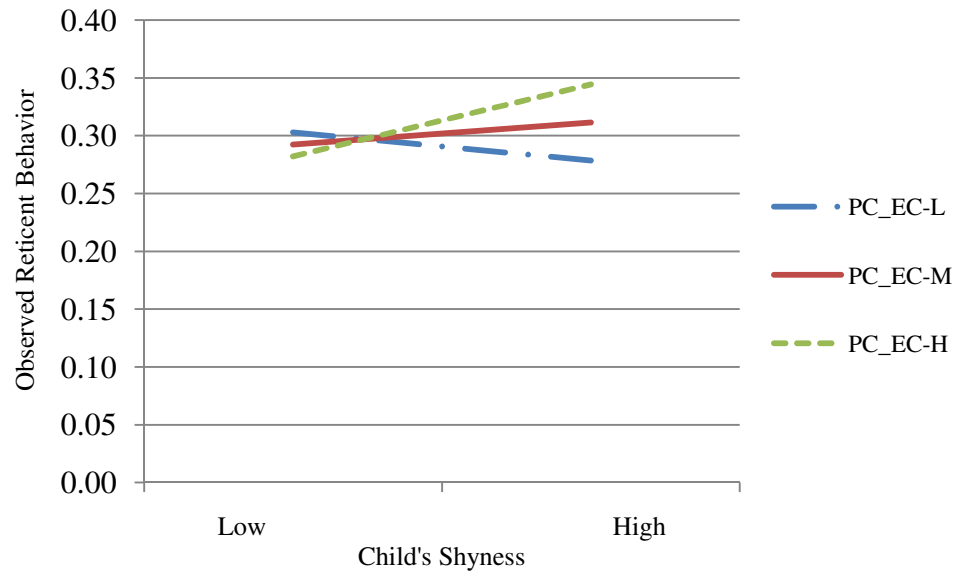


Figure 20. Plot: Reticence predicted by interaction between children's shyness and peer context EC. The regression lines represent the mean of peer context EC, which was centered at zero (PC_EC-M); 1 *SD* below the mean (PC_EC-L); and 1 *SD* above the mean (PC_EC-H).

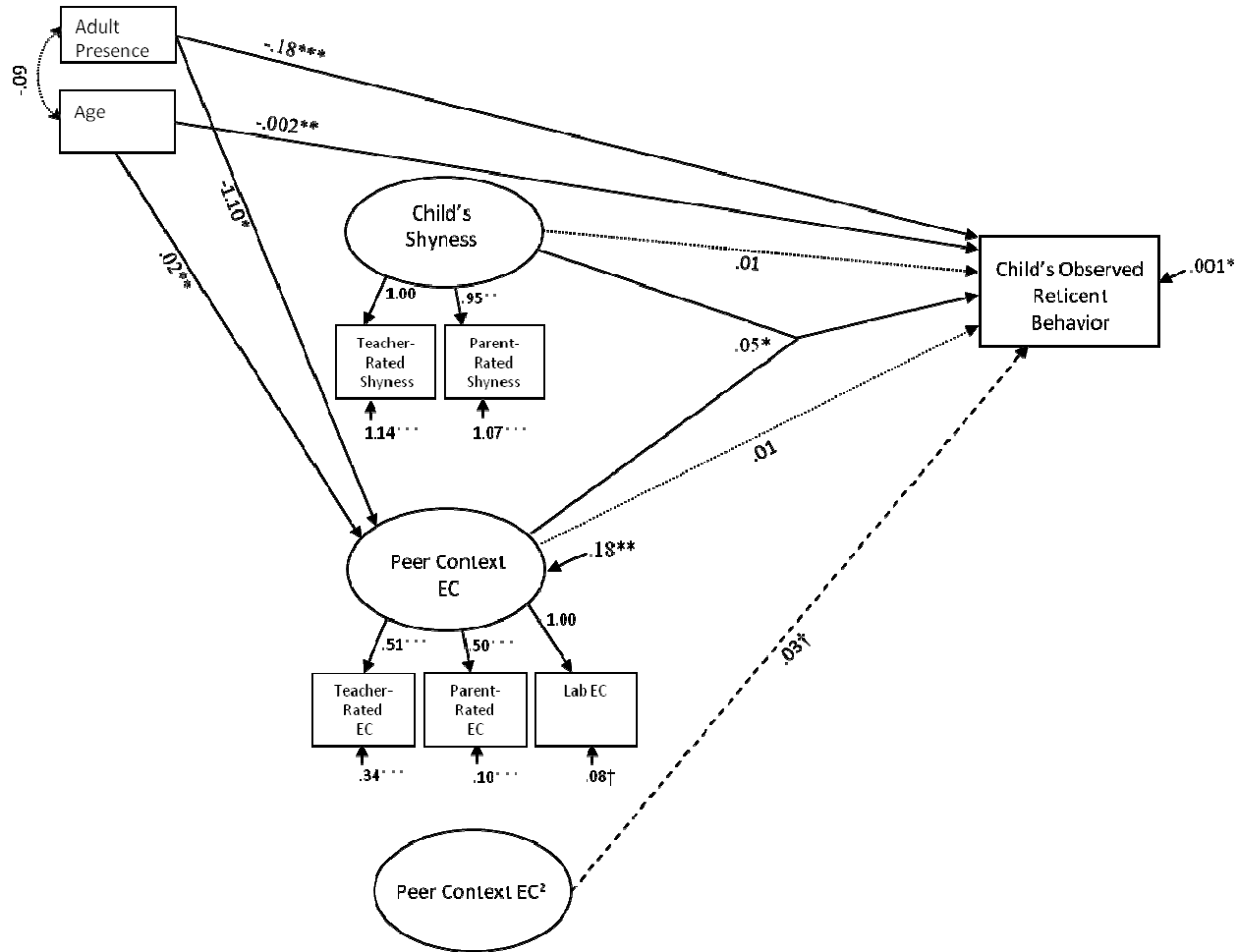


Figure 21. Shy model moderated by peer context EC, with a quadratic. Solid lines denote statistically significant paths, dashed lines represent marginal paths, and dotted lines represent nonsignificant paths.

$\dagger p < .10$. $* p < .05$. $** p < .01$. $*** p < .001$.

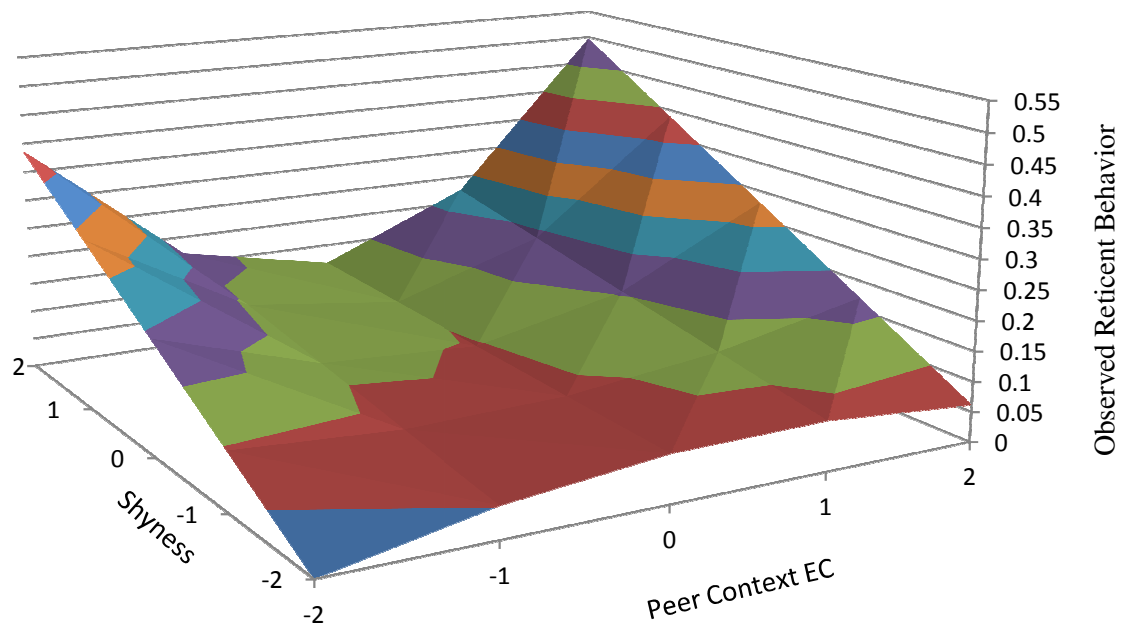


Figure 22. Plot: Reticence predicted by interaction between children's shyness and peer context EC with quadratic. Children's reticent behavior represents the proportion of observed play that consisted of either onlooking or unoccupied behavior; the striations on the surface represent increasing increments of .05.

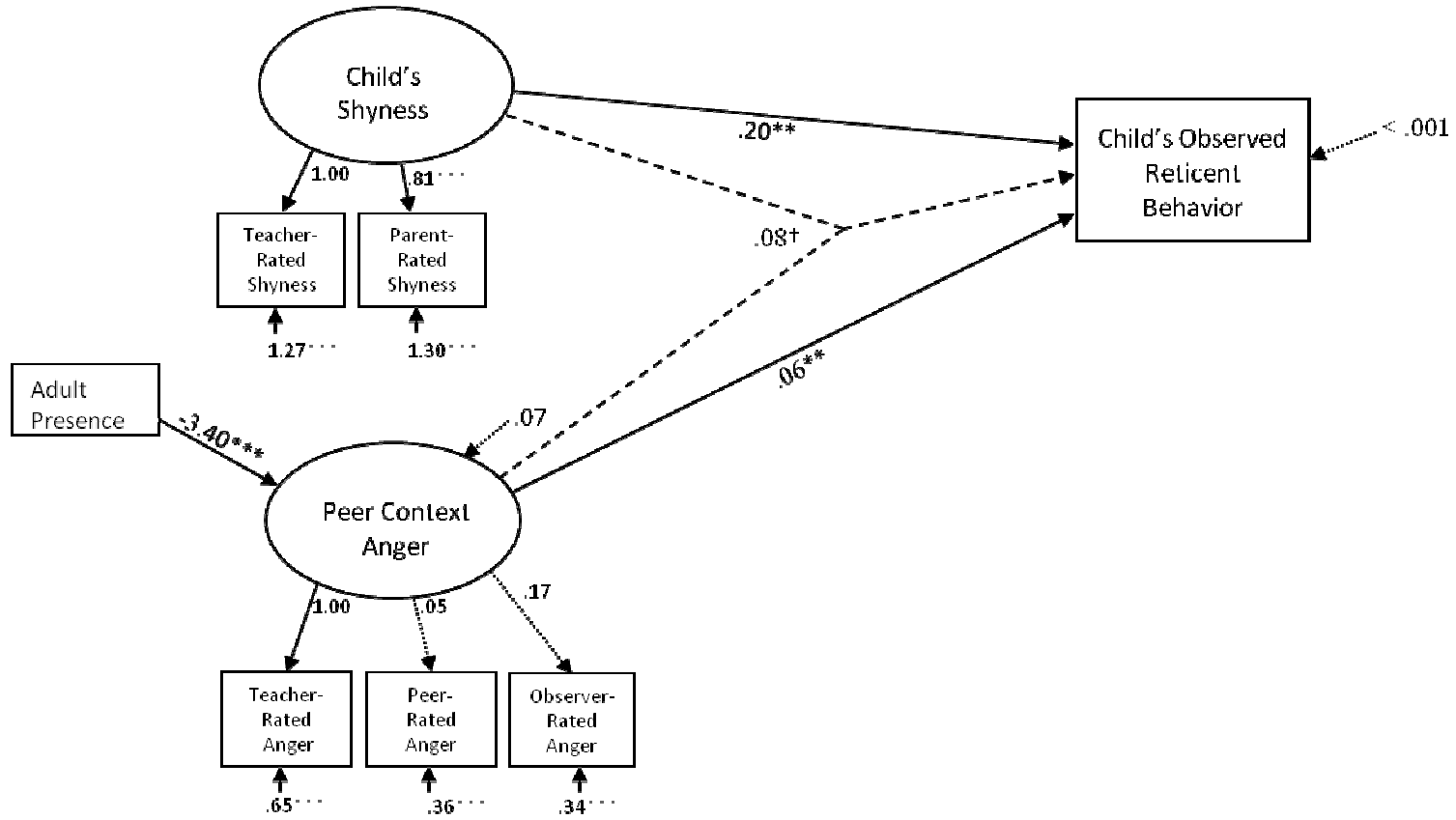


Figure 23. Shy model moderated by peer context anger. Solid lines denote statistically significant paths, dashed lines denote marginally significant paths, and dotted lines represent nonsignificant paths.

$^{\dagger} p < .10$. $* p < .05$. $** p < .01$. $*** p < .001$.

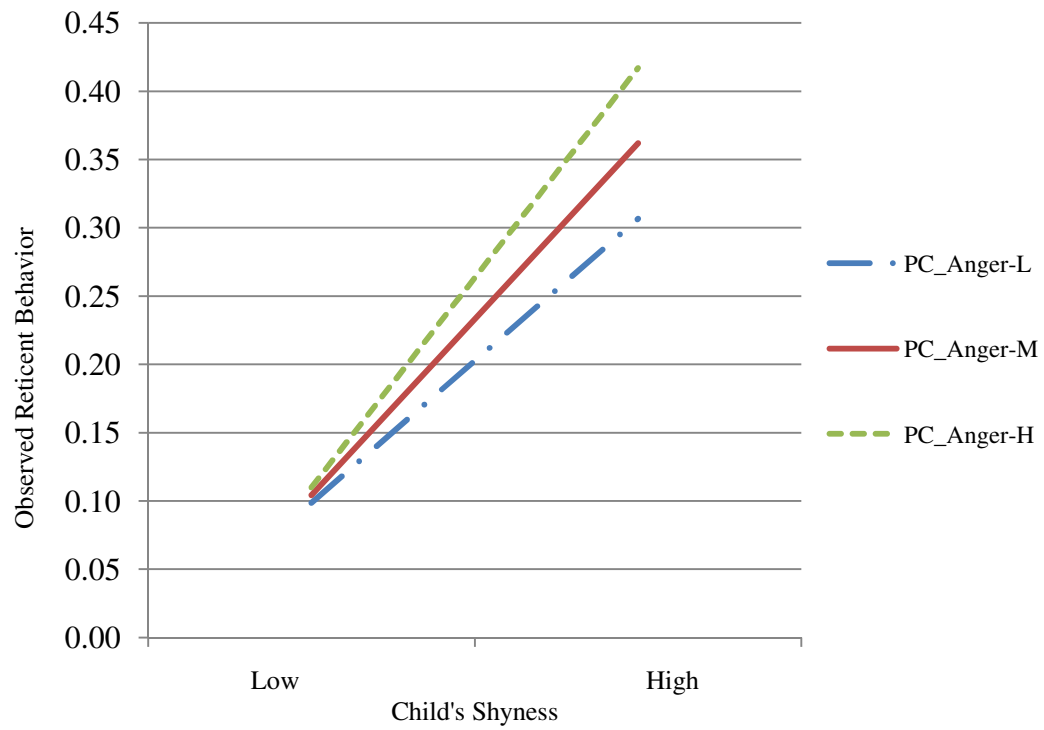


Figure 24. Plot: Reticence predicted by interaction between children's shyness and peer context anger. The regression lines represent the mean of peer context anger, which was centered at zero (PC_Anger-M); 1 *SD* below the mean (PC_Anger-L); and 1 *SD* above the mean (PC_Anger-H).

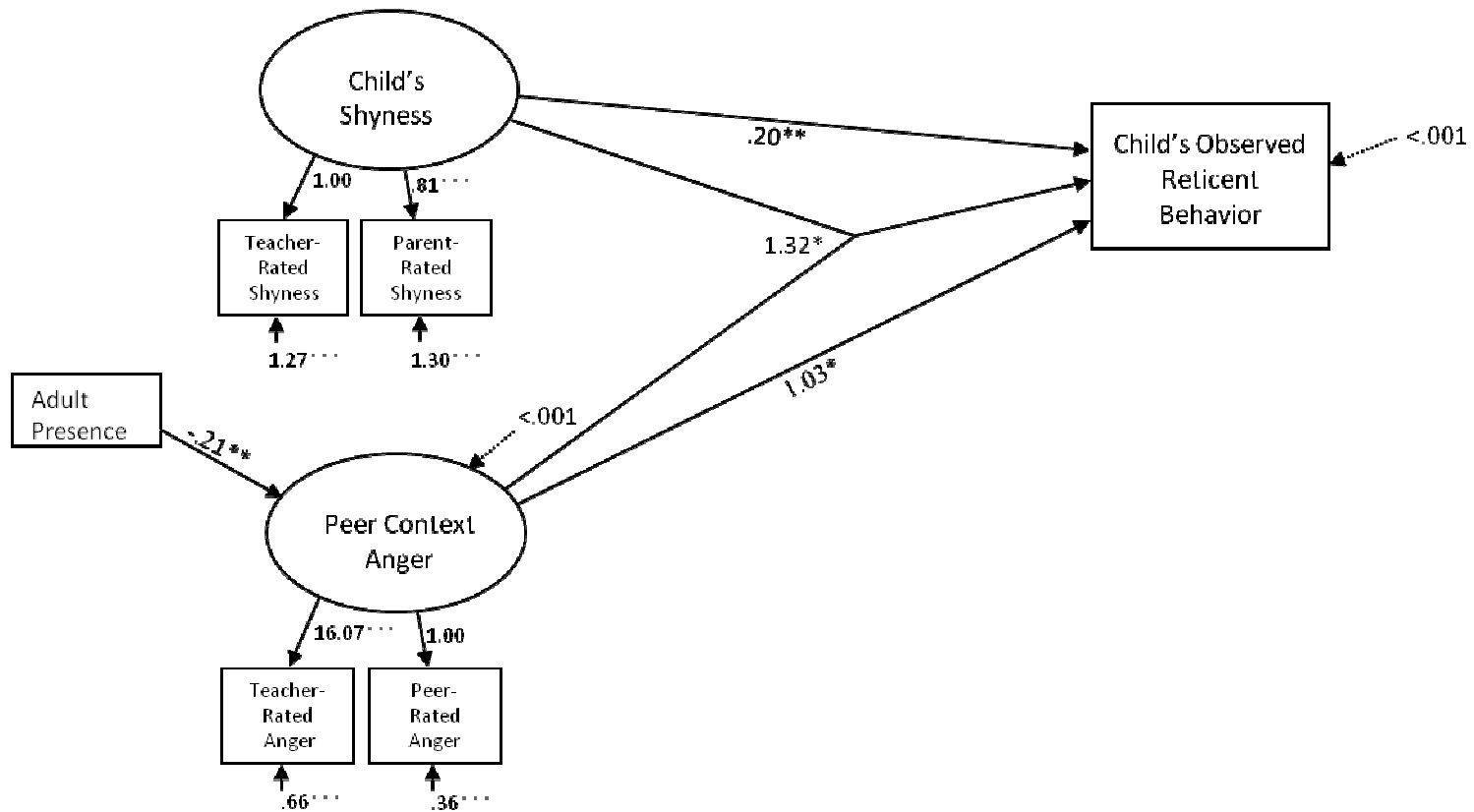


Figure 25. Shy Model Moderated by Peer Context Anger (two-variable version). Solid lines denote statistically significant paths and dotted lines represent nonsignificant paths.

* $p < .05$. ** $p < .01$. *** $p < .001$.

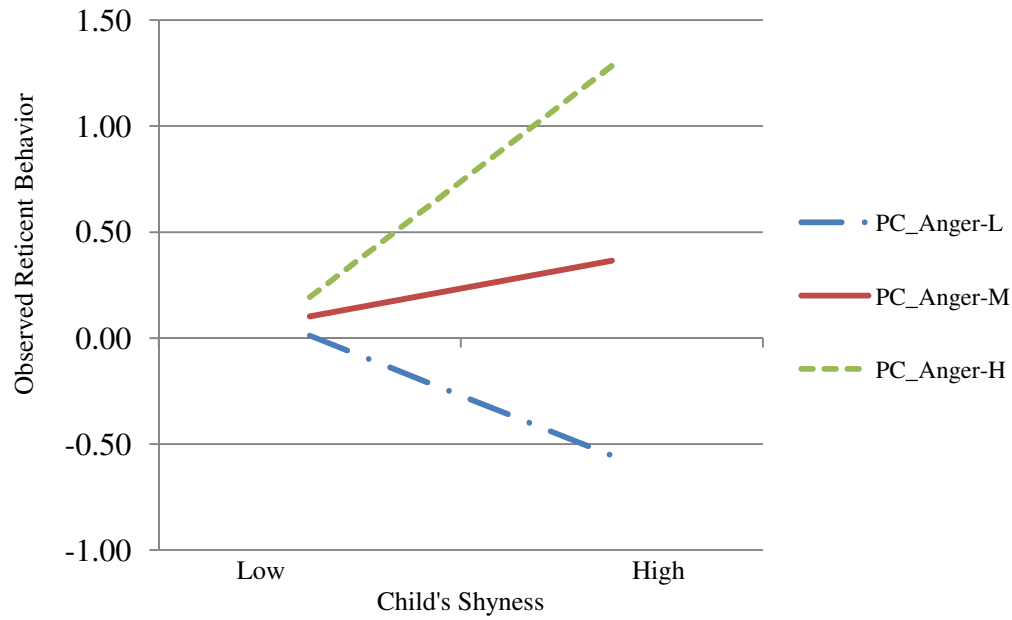


Figure 26. Plot: Reticence predicted by interaction between children's shyness and peer context anger (two-variable version). The regression lines represent the mean of peer context anger, which was centered at zero (PC_Anger-M); 1 *SD* below the mean (PC_Anger-L); and 1 *SD* above the mean (PC_Anger-H).

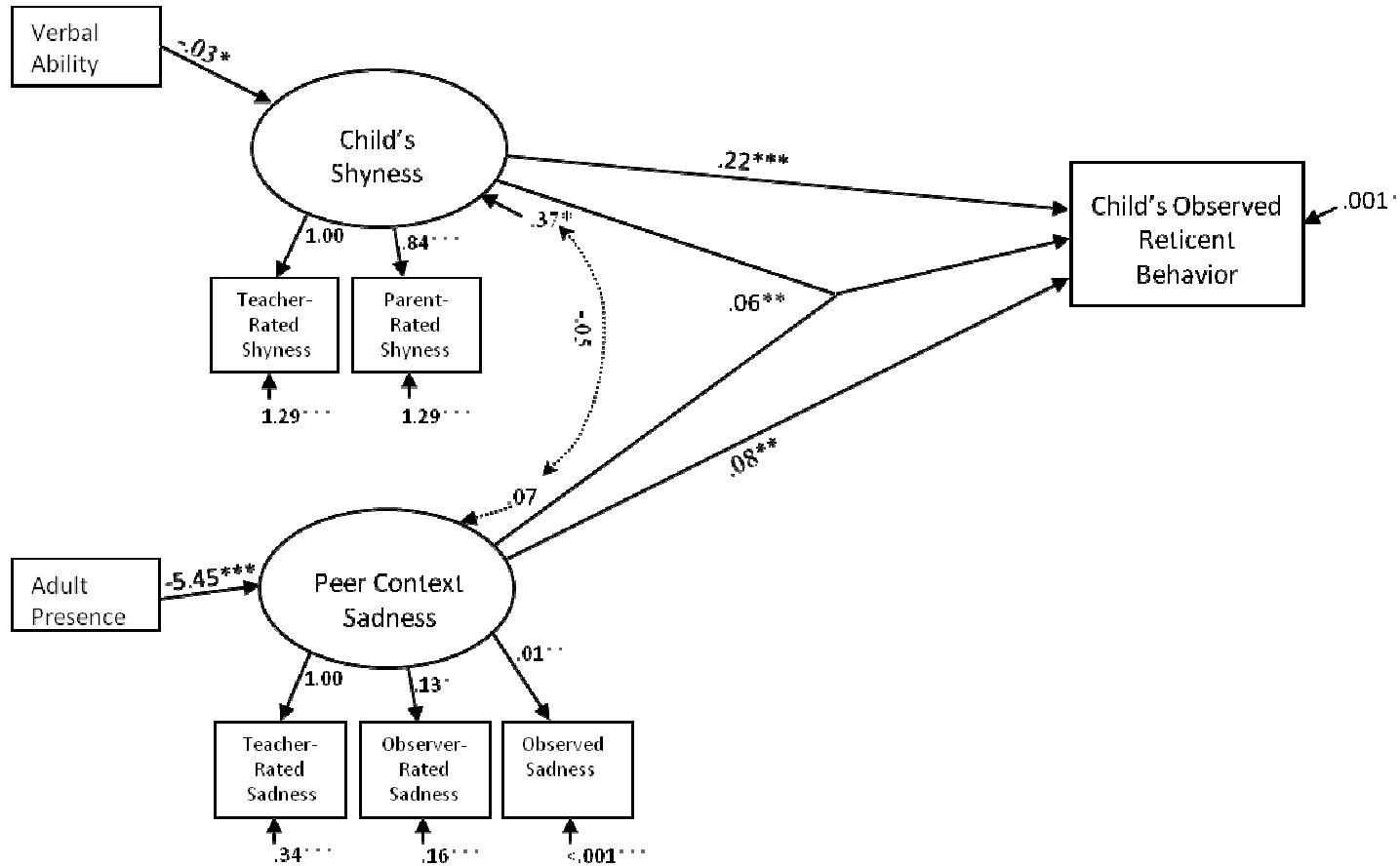


Figure 27. Shy model moderated by peer context sadness. Solid lines denote statistically significant paths and dotted lines represent nonsignificant paths.

* $p < .05$. ** $p < .01$. *** $p < .001$.

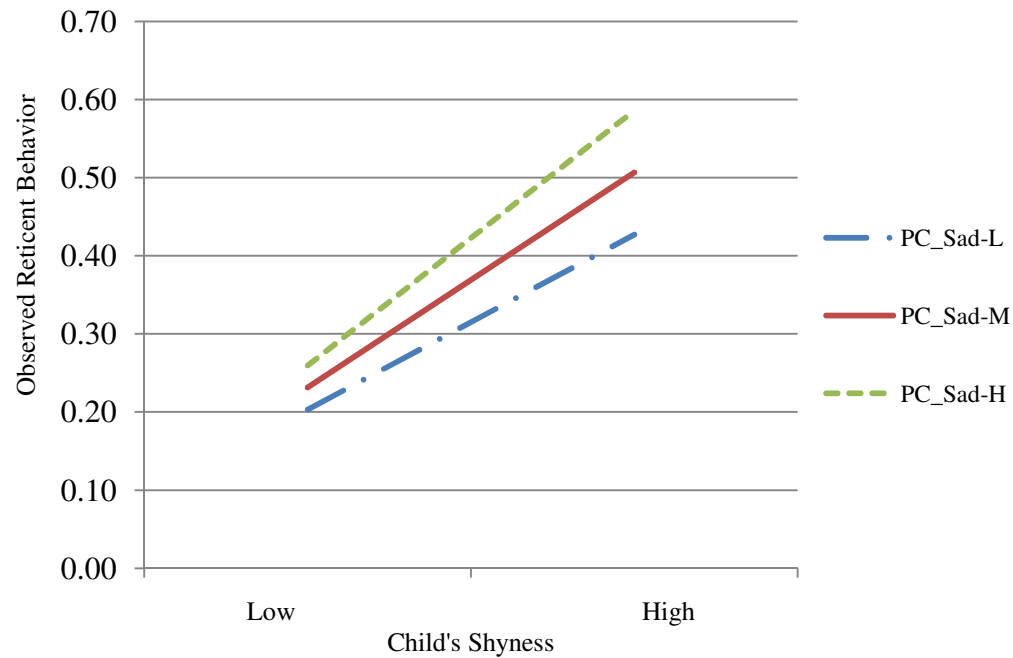


Figure 28. Plot: Reticence predicted by interaction between children's shyness and peer context sadness. The regression lines represent the mean of peer context sadness, which was centered at zero (PC_Sad-M); 1 *SD* below the mean (PC_Sad-L); and 1 *SD* above the mean (PC_Sad-H).

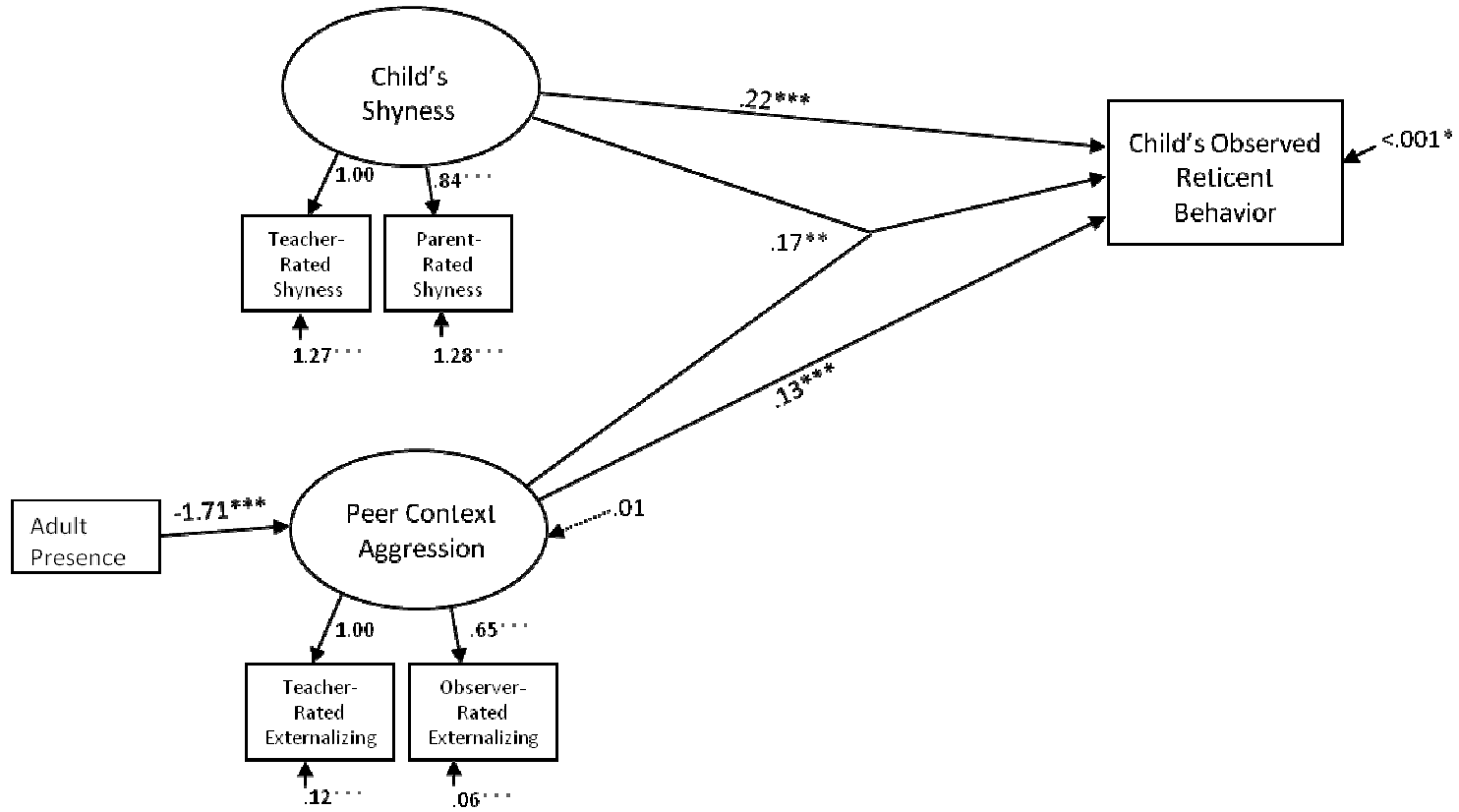


Figure 29. Shy model moderated by peer context aggression. Solid lines denote statistically significant paths and dotted lines represent nonsignificant paths.

* $p < .05$. ** $p < .01$. *** $p < .001$.

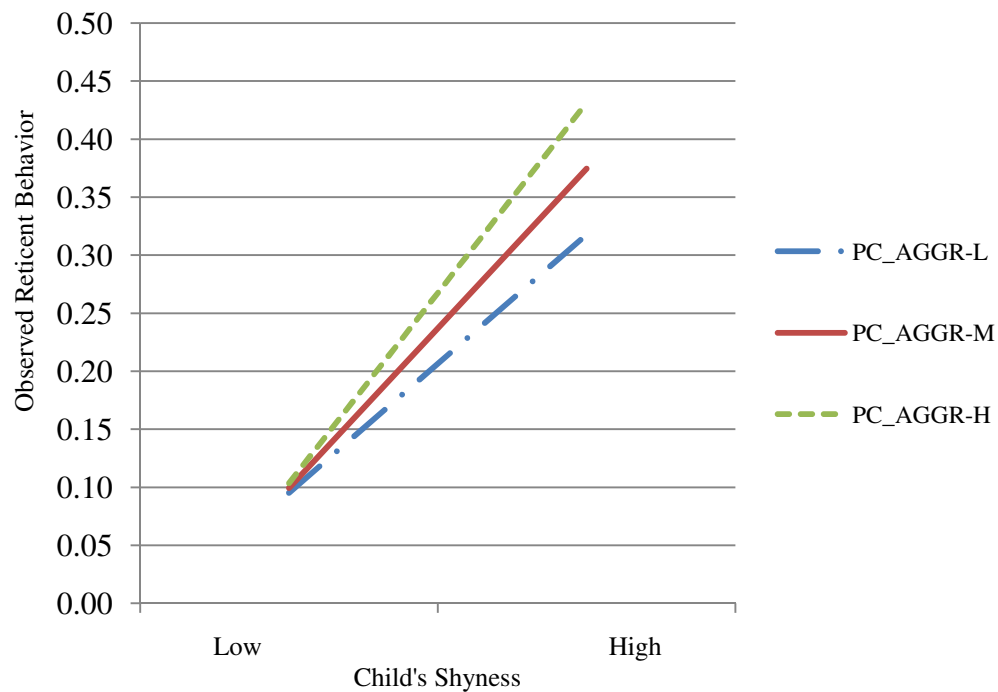


Figure 30. Plot: Reticence predicted by interaction between children's shyness and peer context aggression. The regression lines represent the mean of peer context aggression, which was centered at zero (PC_AGGR-M); 1 *SD* below the mean (PC_ AGGR-L); and 1 *SD* above the mean (PC_ AGGR-H).

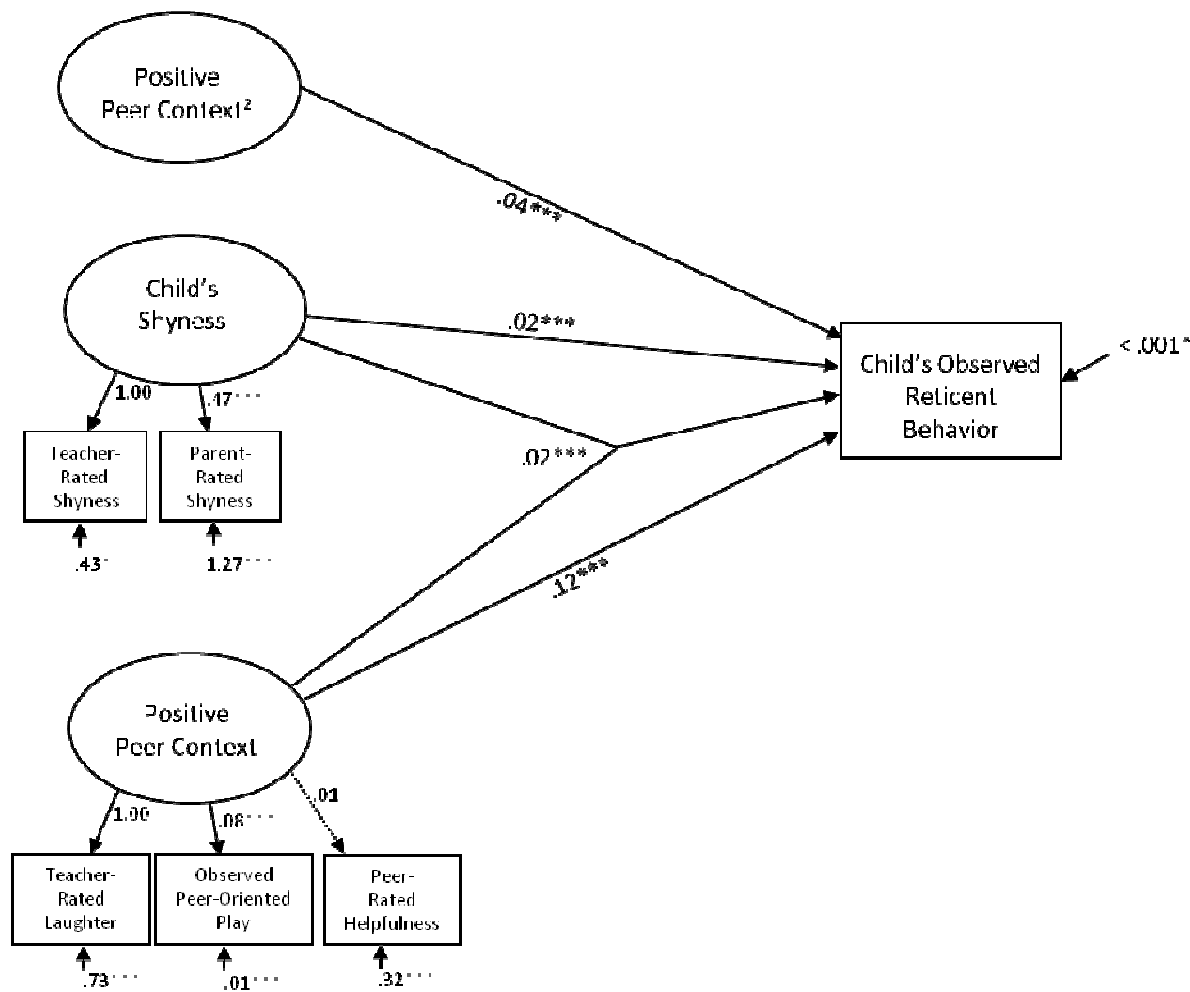


Figure 31. Shy model moderated by positive peer context, with a quadratic. Solid lines denote statistically significant paths and dotted lines represent nonsignificant paths.

* $p < .05$. ** $p < .01$. *** $p < .001$.

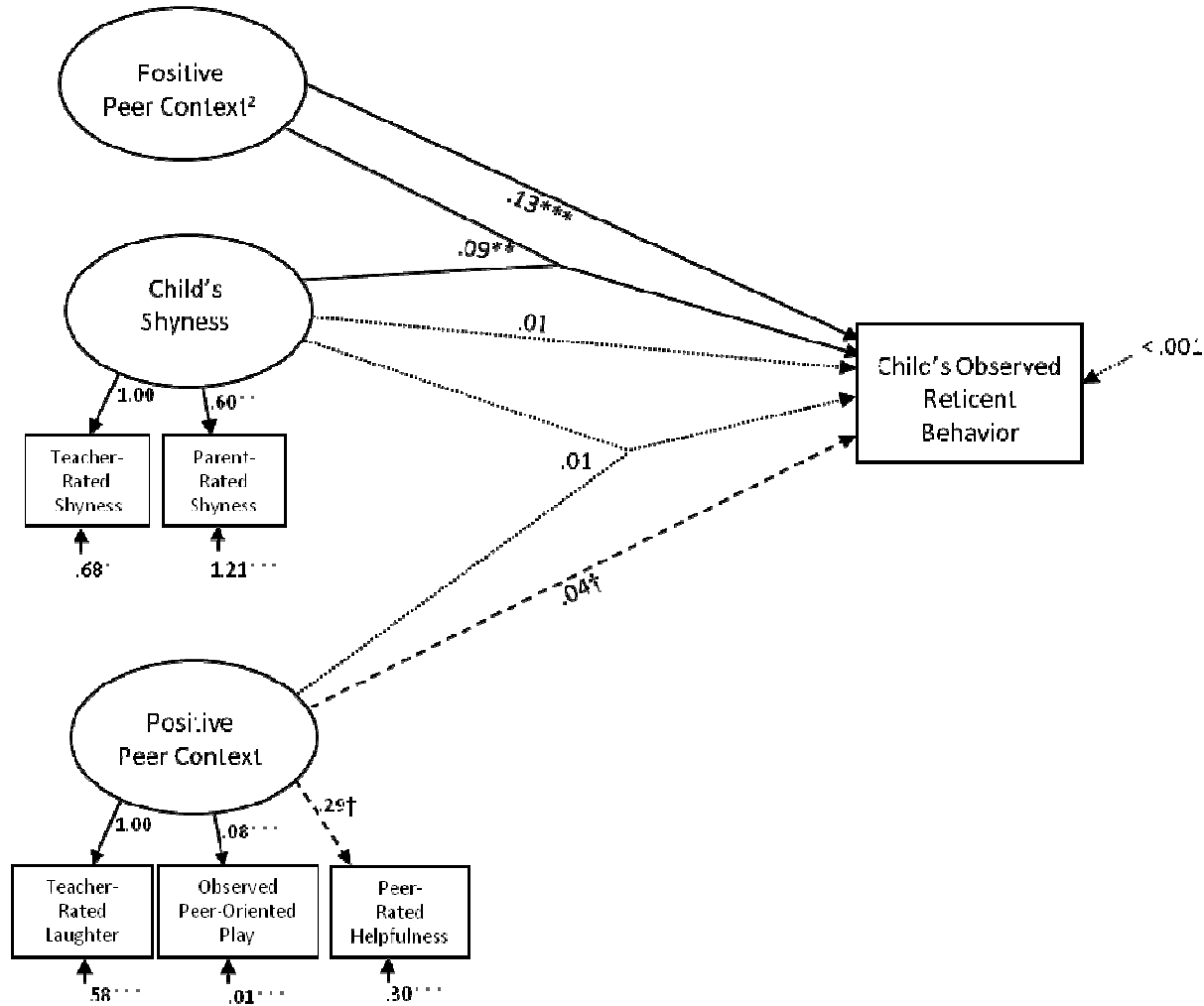


Figure 32. Shy model moderated by positive peer context, with linear x quadratic interaction. Solid lines denote statistically significant paths, dashed lines represent marginal paths, and dotted lines represent nonsignificant paths. $^{\dagger} p < .10$. $^{*} p < .05$. $^{**} p < .01$. $^{***} p < .001$.

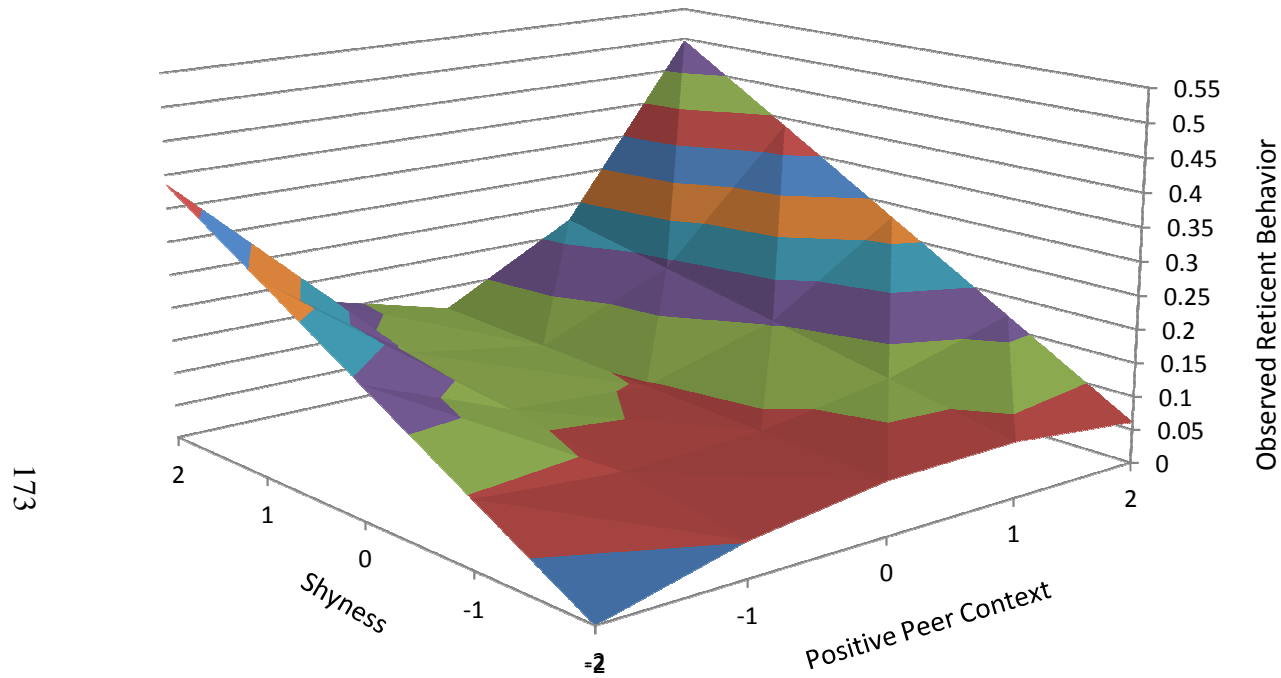


Figure 33. Plot: Reticence predicted by interaction between children's shyness and positive peer context, with linear x quadratic interaction (surface plot). The striations on the surface represent proportions for reticent behavior in increasing increments of .05.

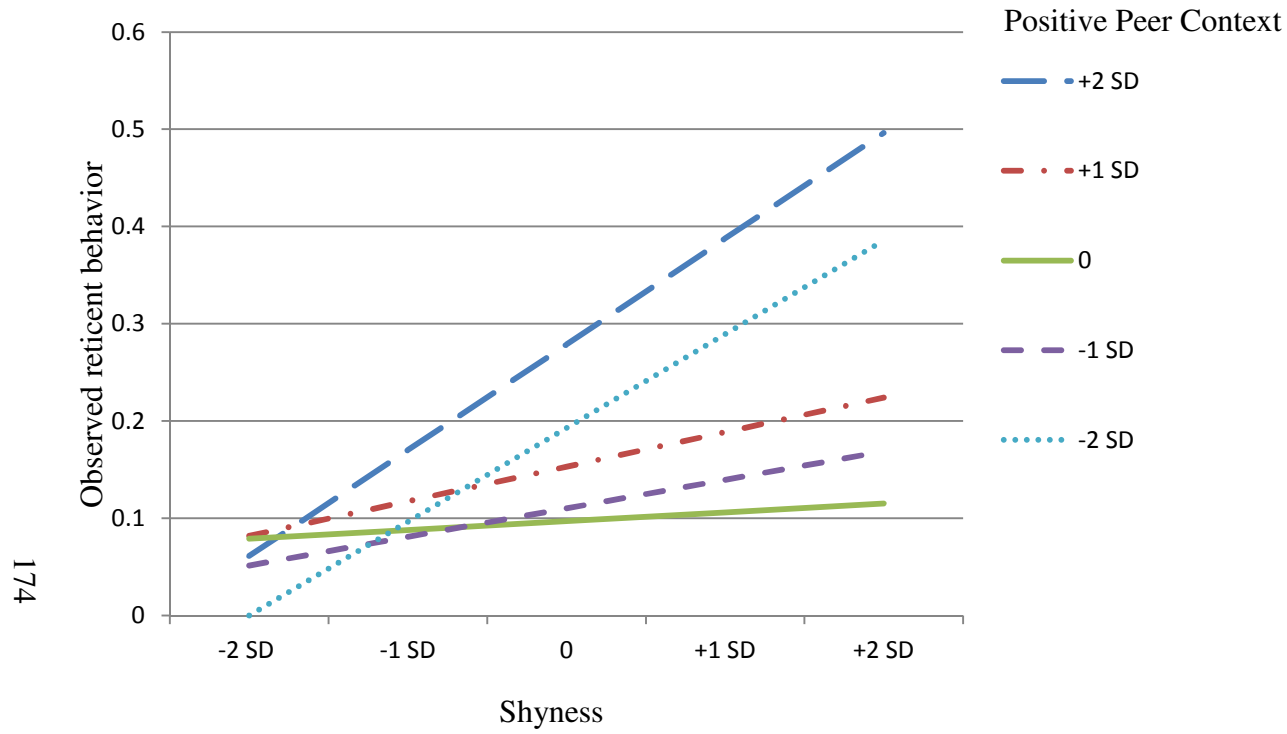


Figure 34. Plot: Reticence predicted by interaction between children's shyness and positive peer context, with linear x quadratic interaction (line plot).

APPENDIX A
UNIVERSITY HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD
APPROVAL DOCUMENTS



Office of Research Integrity and Assurance

To: Nancy Eisenberg
PSY

From:  Mark Roosa, Chair
Soc Beh IRB 

Date: 12/19/2008

Committee Action: Expedited Approval

Approval Date: 12/19/2008

Review Type: Expedited F7

IRB Protocol #: 0812003507

Study Title: Effortful Control, Vagal Regulation and Adjustment in Preschoolers

Expiration Date: 12/18/2009

The above-referenced protocol was approved following expedited review by the Institutional Review Board.

It is the Principal Investigator's responsibility to obtain review and continued approval before the expiration date. You may not continue any research activity beyond the expiration date without approval by the Institutional Review Board.

Adverse Reactions: If any untoward incidents or severe reactions should develop as a result of this study, you are required to notify the Soc Beh IRB immediately. If necessary a member of the IRB will be assigned to look into the matter. If the problem is serious, approval may be withdrawn pending IRB review.

Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, or the investigators, please communicate your requested changes to the Soc Beh IRB. The new procedure is not to be initiated until the IRB approval has been given.

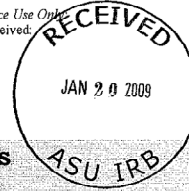
Please retain a copy of this letter with your approved protocol.

Arizona State University
Office of Research Integrity and
Assurance
P.O. Box 871103
Tempe, AZ 85287-1103
Phone: 480-965-6788
Fax: (480) 965-7772



For Office Use Only
Date Received:

0812003507



Modification Form Human Subjects Institutional Review Board (IRB)

INVESTIGATOR INFORMATION		
PROTOCOL TITLE: Effortful control, vagal regulation, and adjustment in preschoolers		HS # 0812003507
PRINCIPAL INVESTIGATOR: Nancy Eisenberg		DEPARTMENT/ CENTER: Psychology
CAMPUS ADDRESS: Department of Psychology, P.O. Box 1104		PHONE: 480-965-5217 EMAIL: nancy.eisenberg@asu.edu
CO-INVESTIGATORS: Tracy Spinrad, Michael Sulik, Snjezana Huerta, Kassondra Silva		
TYPE OF MODIFICATION (CHECK ALL THAT APPLY)		
Please attach any revised documents (forms, scripts, etc). Attach a brief summary of the proposed changes as well as a justification.		
<input type="checkbox"/>	New Procedures	Attach a description of the new procedures and a revised consent form.
<input type="checkbox"/>	Study Title Change	What is the new title?
<input type="checkbox"/>	Change in Study Personnel	<input type="checkbox"/> Add (include the name, role, and contact information. Include copies of training certificates: http://rcsarchintegrity.asu.edu/irb/training/) <input type="checkbox"/> Delete
<input type="checkbox"/>	Change of Site	<input type="checkbox"/> Add (include the name and location. If this changes the enrollment, that should be noted below.) <input type="checkbox"/> Modify <input type="checkbox"/> Delete
<input type="checkbox"/>	Change in Enrollment	Attach a narrative justifying the change. If this will affect the consent, send a revised consent form as well.
<input type="checkbox"/>	Consent Change	Attach a copy and describe the change(s).
<input checked="" type="checkbox"/>	Advertisement	Attach copies of the advertisement or announcement. Based on training sessions, classroom observations will be done in the classroom, instead of through a one-way mirror.
<input checked="" type="checkbox"/>	Instruments (surveys, questionnaires, interviews, etc)	Attach copies of the proposed instruments and describe any changes from the approved protocol. If you are adding or deleting any instruments or items to an instrument, describe what the changes are and submit the revised materials. Demographic questionnaire added.
<input type="checkbox"/>	Other	Describe the changes. If this affects the consent process, submit a revised consent form.
SIGNATURE		
PRINCIPAL INVESTIGATOR: Nancy Eisenberg Approved	Name (first, middle, last): Nancy Eisenberg	Date: 1/20/09
Signature: <i>[Handwritten Signature]</i>		Date: 1/23/09

Sig *[Handwritten Signature]*
Date 1/23/09

Revision 04/08

To: Nancy Eisenberg
PSY

From: Mark Roosa, Chair
Soc Beh IRB

Date: 02/20/2009

Committee Action: **Amendment to Approved Protocol**

Approval Date: 02/20/2009

Review Type: Expedited F12

IRB Protocol #: 0812003507

Study Title: Effortful Control, Vagal Regulation and Adjustment in Preschoolers

Expiration Date: 12/18/2009

The amendment to the above-referenced protocol has been APPROVED following Expedited Review by the Institutional Review Board. This approval does not replace any departmental or other approvals that may be required. It is the Principal Investigator's responsibility to obtain review and continued approval of ongoing research before the expiration noted above. Please allow sufficient time for reapproval. Research activity of any sort may not continue beyond the expiration date without committee approval. Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol on the expiration date. Information collected following suspension is unapproved research and cannot be reported or published as research data. If you do not wish continued approval, please notify the Committee of the study termination.

This approval by the Soc Beh IRB does not replace or supersede any departmental or oversight committee review that may be required by institutional policy.

Adverse Reactions: If any untoward incidents or severe reactions should develop as a result of this study, you are required to notify the Soc Beh IRB immediately. If necessary a member of the IRB will be assigned to look into the matter. If the problem is serious, approval may be withdrawn pending IRB review.

Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, or the investigators, please communicate your requested changes to the Soc Beh IRB. The new procedure is not to be initiated until the IRB approval has been given.

Please retain a copy of this letter with your approved protocol.

Arizona State University
Office of Research Integrity and Assurance
P.O. Box 871103
Tempe, AZ 85287-1103
Phone: 480-965-6788
Fax: (480) 965-7772



0812003507
For Office Use Only:
Date Received:



Modification Form Human Subjects Institutional Review Board (IRB)

INVESTIGATOR INFORMATION		
PROTOCOL TITLE: Effortful control, vagal regulation, and adjustment in preschoolers	HS # 0812003507	
PRINCIPAL INVESTIGATOR: Nancy Eisenberg	DEPARTMENT/CENTER: Psychology	
CAMPUS ADDRESS: Department of Psychology, P.O. Box 1104	PHONE: 480-965-5217 EMAIL: nancy.eisenberg@asu.edu	
CO-INVESTIGATORS: Tracy Spinrad, Michael Sulik, Snjezana Huerta, Kassondra Silva		
TYPE OF MODIFICATION (CHECK ALL THAT APPLY)		
Please attach any revised documents (forms, scripts, etc). Attach a brief summary of the proposed changes as well as a justification.		
<input type="checkbox"/>	New Procedures	Attach a description of the new procedures and a revised consent form.
<input type="checkbox"/>	Study Title Change	What is the new title?
<input type="checkbox"/>	Change in Study Personnel	<input type="checkbox"/> Add (include the name, role, and contact information. Include copies of training certificates: http://researchintegrity.asu.edu/irb/training/) <input type="checkbox"/> Delete
<input type="checkbox"/>	Change of Site	<input type="checkbox"/> Add (include the name and location. If this changes the enrollment, that should be noted below.) <input type="checkbox"/> Modify <input type="checkbox"/> Delete
<input type="checkbox"/>	Change in Enrollment	Attach a narrative justifying the change. If this will affect the consent, send a revised consent form as well.
<input checked="" type="checkbox"/>	Consent Change	Attach a copy and describe the change(s). We are adding a second consent form that would allow parents who do not wish for their children to participate in the entire study to consent to a single measure that is not valid without high participation rates.
<input type="checkbox"/>	Advertisement	Attach copies of the advertisement or announcement.
<input type="checkbox"/>	Instruments (surveys, questionnaires, interviews, etc)	Attach copies of the proposed instruments and describe any changes from the approved protocol. If you are adding or deleting any instruments or items to an instrument, describe what the changes are and submit the revised materials.
<input type="checkbox"/>	Other	Describe the changes. If this affects the consent process, submit a revised consent form.
SIGNATURE		
PRINCIPAL INVESTIGATOR: Nancy Eisenberg	Name (first, middle, last): <i>Wendy Chang</i>	Date: <i>2/19/09</i>
ASU IRB Approved	Signature: <i>[Signature]</i>	Date: <i>2/20/09</i>

Sig *[Signature]*
Date *2/20/09*

Revision 04/08



Office of Research Integrity and Assurance

To: Nancy Eisenberg
PSY

From:  Mark Roosa, Chair 
Soc Beh IRB

Date: 04/06/2009

Committee Action: Amendment to Approved Protocol

Approval Date: 04/06/2009

Review Type: Expedited F12

IRB Protocol #: 0812003507

Study Title: Effortful Control, Vagal Regulation and Adjustment in Preschoolers

Expiration Date: 12/18/2009

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Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, or the investigators, please communicate your requested changes to the Soc Beh IRB. The new procedure is not to be initiated until the IRB approval has been given.

Please retain a copy of this letter with your approved protocol.

Arizona State University
Office of Research Integrity and Assurance
P.O. Box 871103
Tempe, AZ 85287-1103
Phone: 480-965-6788
Fax: (480) 965-7772



For Office Use Only:
Date Received:

Modification Form Human Subjects Institutional Review Board (IRB)

INVESTIGATOR INFORMATION		
PROTOCOL TITLE: Effortful control, vagal regulation, and adjustment in preschoolers	HS # 0812003507 <i>R0 03</i>	
PRINCIPAL INVESTIGATOR: Nancy Eisenberg	DEPARTMENT / CENTER: Psychology	
CAMPUS ADDRESS: Department of Psychology, P.O. Box 1104	PHONE: 480-965-5217 EMAIL: nancy.eisenberg@asu.edu	
CO-INVESTIGATORS: Tracy Spinrad, Michael Sulik, Snejzana Huerta, Kassondra Silva		
TYPE OF MODIFICATION (CHECK ALL THAT APPLY)		
Please attach any revised documents (forms, scripts, etc). Attach a brief summary of the proposed changes as well as a justification.		
<input type="checkbox"/>	New Procedures	Attach a description of the new procedures and a revised consent form.
<input type="checkbox"/>	Study Title Change	What is the new title?
<input type="checkbox"/>	Change in Study Personnel	<input type="checkbox"/> Add (include the name, role, and contact information. Include copies of training certificates: http://researchintegrity.asu.edu/irb/training/) <input type="checkbox"/> Delete
<input type="checkbox"/>	Change of Site	<input type="checkbox"/> Add (include the name and location. If this changes the enrollment, that should be noted below.) <input type="checkbox"/> Modify <input type="checkbox"/> Delete
<input type="checkbox"/>	Change in Enrollment	Attach a narrative justifying the change. If this will affect the consent, send a revised consent form as well.
<input type="checkbox"/>	Consent Change	Attach a copy and describe the change(s).
<input type="checkbox"/>	Advertisement	Attach copies of the advertisement or announcement.
<input checked="" type="checkbox"/>	Instruments (surveys, questionnaires, interviews, etc)	Attach copies of the proposed instruments and describe any changes from the approved protocol. If you are adding or deleting any instruments or items to an instrument, describe what the changes are and submit the revised materials. We would like to add one scale (activational control) from the Children's Behavior Questionnaire (CBQ) to the parent and teacher questionnaires. This scale has already been approved for use in the observer questionnaire.
<input type="checkbox"/>	Other	Describe the changes. If this affects the consent process, submit a revised consent form.
SIGNATURE		
PRINCIPAL INVESTIGATOR: Nancy Eisenberg	Name (first, middle, last)	<i>Nancy Eisenberg</i>
	Signature:	<i>Nancy Eisenberg</i>
		Date: <i>3/20/09</i>



Approved: *M. Wilkerson 4/5/09*

Revision 04/08



Office of Research Integrity and Assurance

To: Nancy Eisenberg
PSY

From:  Mark Roosa, Chair 
Soc Beh IRB

Date: 04/06/2009

Committee Action: Amendment to Approved Protocol

Approval Date: 04/06/2009

Review Type: Expedited F12

IRB Protocol #: 0812003507

Study Title: Effortful Control, Vagal Regulation and Adjustment in Preschoolers

Expiration Date: 12/18/2009

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For Office Use Only:
Date Received:

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PROTOCOL TITLE: Effortful control, vagal regulation, and adjustment in preschoolers	HS # 0812003507 <i>R 004</i>	
PRINCIPAL INVESTIGATOR: Nancy Eisenberg	DEPARTMENT / CENTER: Psychology	
CAMPUS ADDRESS: Department of Psychology, P.O. Box 1104	PHONE: 480-965-5217 EMAIL: nancy.eisenberg@asu.edu	
CO-INVESTIGATORS: Tracy Spinrad, Michael Sulik, Snjezana Huerta, Kassondra Silva		
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<input type="checkbox"/>	Advertisement	Attach copies of the advertisement or announcement.
<input checked="" type="checkbox"/>	Instruments (surveys, questionnaires, interviews, etc)	Attach copies of the proposed instruments and describe any changes from the approved protocol. If you are adding or deleting any instruments or items to an instrument, describe what the changes are and submit the revised materials. We will switch from the full version of the Children's Behavior Questionnaire (CBQ) to the short form of the CBQ. The reduced attention shifting scale from Eisenberg et al. (2005) will be used instead of the full version from the CBQ. Using the short form instead of the full version will allow us to reduce the time demands for parents and teachers. We will also add a question about child height/weight to the demographic form and will ask parents if we may record children's height and weight.
<input type="checkbox"/>	Other	Describe the changes. If this affects the consent process, submit a revised consent form.

Approved: *[Signature]* 4/5/09

Revision 04/08

To: Nancy Eisenberg
PSY

From: Mark Roosa, Chair
Soc Beh IRB

Date: 04/24/2009

Committee Action: **Expedited Approval**

Approval Date: 04/24/2009

Review Type: Expedited F12

IRB Protocol #: 0812003507

Study Title: Effortful Control, Vagal Regulation and Adjustment in Preschoolers

Expiration Date: 12/18/2009

The above-referenced protocol was approved following expedited review by the Institutional Review Board.

It is the Principal Investigator's responsibility to obtain review and continued approval before the expiration date. You may not continue any research activity beyond the expiration date without approval by the Institutional Review Board.

Adverse Reactions: If any untoward incidents or severe reactions should develop as a result of this study, you are required to notify the Soc Beh IRB immediately. If necessary a member of the IRB will be assigned to look into the matter. If the problem is serious, approval may be withdrawn pending IRB review.

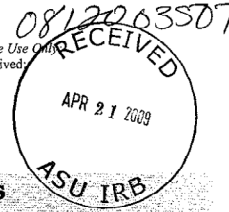
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CAMPUS ADDRESS: Department of Psychology, P.O. Box 1104	PHONE: 480-965-5217 EMAIL: nancy.eisenberg@asu.edu	
CO-INVESTIGATORS: Tracy Spinrad, Michael Sulik, Snejzana Huerta, Kassondra Silva, Anne Kupfer		
TYPE OF MODIFICATION (CHECK ALL THAT APPLY)		
Please attach any revised documents (forms, scripts, etc). Attach a brief summary of the proposed changes as well as a justification.		
<input checked="" type="checkbox"/>	New Procedures	Attach a description of the new procedures and a revised consent form. We would like to add another session in which the child will play two computer games that measure children's selective attention and impulsivity. Refer to attached information page and script for a description of the computer games along with new parent permission form and child assent form.
<input type="checkbox"/>	Study Title Change	What is the new title?
<input checked="" type="checkbox"/>	Change in Study Personnel	X Add (include the name, role, and contact information. Include copies of training certificates: http://researchintegrity.asu.edu/irb/training/) Anne Kupfer, Co-Investigator, Dept of Psychology, PO Box 871104, 480-965-7014, anne.kupfer@asu.edu <input type="checkbox"/> Delete
<input type="checkbox"/>	Change of Site	<input type="checkbox"/> Add (include the name and location. If this changes the enrollment, that should be noted below.) <input type="checkbox"/> Modify <input type="checkbox"/> Delete
<input type="checkbox"/>	Change in Enrollment	Attach a narrative justifying the change. If this will affect the consent, send a revised consent form as well.
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<input type="checkbox"/>	Other	Describe the changes. If this affects the consent process, submit a revised consent form.
SIGNATURE		
PRINCIPAL INVESTIGATOR: Nancy Eisenberg	Name (first, middle, last):	
	Signature: <i>Nancy Eisenberg</i> Date: 4/2/09	

RECEIVED
 APR 21 2009
 ASU IRB

Revision 04/08

To: Nancy Eisenberg
PSY

From: Mark Roosa, Chair
Soc Beh IRB

Date: 08/21/2009

Committee Action: **Amendment to Approved Protocol**

Approval Date: 08/21/2009

Review Type: Expedited F12

IRB Protocol #: 0812003507

Study Title: Effortful Control, Vagal Regulation and Adjustment in Preschoolers

Expiration Date: 12/18/2009

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Please retain a copy of this letter with your approved protocol.

To: Nancy Eisenberg
PSY

From: Mark Roosa, Chair
Soc Beh IRB

Date: 02/19/2010

Committee Action: **Amendment to Approved Protocol**

Approval Date: 02/19/2010

Review Type: Expedited F12

IRB Protocol #: 0812003507

Study Title: Effortful Control, Vagal Regulation and Adjustment in Preschoolers

Expiration Date: 12/07/2010

The amendment to the above-referenced protocol has been APPROVED following Expedited Review by the Institutional Review Board. This approval does not replace any departmental or other approvals that may be required. It is the Principal Investigator's responsibility to obtain review and continued approval of ongoing research before the expiration noted above. Please allow sufficient time for reapproval. Research activity of any sort may not continue beyond the expiration date without committee approval. Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol on the expiration date. Information collected following suspension is unapproved research and cannot be reported or published as research data. If you do not wish continued approval, please notify the Committee of the study termination.

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CAMPUS ADDRESS: Department of Psychology, P.O. Box 1104	PHONE: 480-965-5217 EMAIL: nancy.eisenberg@asu.edu	
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<input type="checkbox"/>	Advertisement	Attach copies of the advertisement or announcement.
<input checked="" type="checkbox"/>	Instruments (surveys, questionnaires, interviews, etc)	Attach copies of the proposed instruments and describe any changes from the approved protocol. If you are adding or deleting any instruments or items to an instrument, describe what the changes are and submit the revised materials. The attached is an addendum to the teacher questionnaires, asking them to identify the peer groups of the participants. This question falls within the scope of the existing parental permission forms, which requests consent to provide teachers “a questionnaire asking about your child’s temperament, classroom behaviors, and relationships”. We want to test how the characteristics of the peers children play with (e.g., their self-regulation) may affect the relation between the child’s own characteristics (e.g., self-regulation) and their social behavior in the classroom (e.g., the degree to which the socialize with other children, play alone, etc.). Using a paper and pencil format, teachers will be asked to identify participating children’s most frequent

		peer contacts from their classroom rosters (i.e., typed in alphabetical order). Upon receipt of their responses, the data will be entered using 4-digit participant codes only. The original materials will be stored in a locked and secure area. The data will be destroyed approximately 10+ years following final data collection, after all findings are published (we are required to keep data for 7 years in our field after publication).
<input type="checkbox"/>	Other	Describe the changes. If this affects the consent process, submit a revised consent form.
SIGNATURE		
PRINCIPAL INVESTIGATOR: Nancy Eisenberg	Name (first, middle, last):	
	Signature:	Date:

APPENDIX B

TABLE OF MEASURES AND INFORMANTS

<i>Measure:</i>	<i>Source:</i>	<i>Child</i>	<i>Parent</i>	<i>Teacher</i>	<i>Peers</i>	<i>Observers</i>
Aggressive Behavior (Externalizing)				X		X
Anger/Frustration (CBQ)				X		
Demographics			X			
EC (Observed): Bird & Dragon, Gift Wrap, Knock Tap, CPT		X				
EC (Reported): Activation Control, Attention Focusing (CBQ), Attention Shifting (CBQ), Inhibitory Control (CBQ)			X	X		
Naturalistic Observations of Play and Emotions						X
Peer Context Members (to identify 3 peers)				X		X
Peer Nominations: Angry/Argues, Helpful					X	
Peer Ratings of Liking					X	
Sadness (CBQ)				X		X
Shyness (CBQ)			X	X		
Smiling/Laughter (CBQ)				X		
Receptive Language (WPPSI-III)		X				

APPENDIX C
AGGRESSIVE BEHAVIOR

Please rate the extent to which the following items have been true of this child during the last three months.

	Never	Almost Never	Sometimes	Often
1. Physically harms other children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Lies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Disobedient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Swears	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Breaks things on purpose	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Temper tantrums	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Starts fights with other children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Yells at others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Cruel to animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Takes things that belong to others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Easily upset, annoyed or irritated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Aggressive to adults	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Argues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Blames others for misbehavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Talks back, sasses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Sneaky	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. Defiant towards adults	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. Breaks rules	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. Whines and nags	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. Stubborn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. Teases other children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36. Demands too much attention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39. Threatens or bullies other children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX D
BIRD AND DRAGON

ID# ID
 DVD# DVD
 M r

Date
 Coder

Understanding	None	Partial	Full
Bird Commands pbdundb	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dragon Commands pbdundd	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

		Bird Commands				Dragon Commands					
		No Response (0)	Partial (1)	Wrong (2)	Full (3)	Full (0)	Wrong (1)	Partial (2)	No Response (3)		
pbdbrd1	1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pbdbrg1
						3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pbdbrg2
pbdbrd2	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pbdbrg3
						6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pbdbrg4
						7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pbdbrg5
pbdbrd3	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pbdbrg6
pbdbrd4	10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pbdbrg7
pbdbrd5	12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
pbdbrd6	13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pbdbrg8
						15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pbdbrg9
						16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	pbdbrg10

Cooperation	None	A few times	Most of the time	All/almost all times
pbdcoop	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	0	1		
Quality	(Not Usable)	(Usable)		
pbdqual	<input type="radio"/>	<input type="radio"/>		

Overview of the Task

This task contains 12 trials, during which Experimenter (E) will show a “Bird” or a “Dragon” puppet. This task is kind of like “Simon Says” where C will have to restrain from moving according to which puppet is giving instructions.

C will be asked to *imitate* what the “Bird” puppet says to do (for example, Bird may say, **Touch your head**). C will be asked to not perform the activities that the “Dragon” puppet instructs (the child should just stay still). E will train C what to do and allow C as many practice trials as necessary (continue until it is either clear that C understands or will not be made to understand how to perform the task) before proceeding to the real trials.

During the real trials, E must perform the action (either “Bird” or “Dragon” speaks, according to script), wait no more and no less than 2 seconds for C to respond, and proceed to the next action until all actions have been performed. E will give one reminder of the instructions during the real trials.

The hardest part of this is making sure that the child understands the instructions. This sometimes requires that the E physically prevent the child from acting when the “Dragon” gives instructions. The E needs to be engaging, but using the same type of voice for both the bird and dragon. Camera person needs to get the C’s actions on camera, but also helps if we can see which puppet is talking (a small view of this is fine). We plan to use the same script for every kid, but we’ll vary what hand (left or right) the E will hold Bird or Dragon.

Materials Needed

- One “Bird” and one “Dragon” puppet.
- Bird/Dragon Script sheet.

Videotaping Instructions

Throughout this task, capture C’s entire body and face in the chair, with C filling most of the frame. Part of the frame should capture both the “Bird” and “Dragon” puppets.

Script

—Please follow the script exactly—

*Task seems to work well if child is seated through the task. E gets the bird and dragon puppets and cue sheet (so they don't have to memorize the script). E should kneel in front of C (E also may stand if C is reaching for the puppets), a few feet back and slightly off to the left side so as not to block the camera view. Place the cue sheet on the floor in front of you. E holds up the puppets and says, "I have a game we can play with these puppets. This is a nice bird. (Hold up bird puppet). When he talks to us, we will do what he tells us to do. Make sure C understands the directions at this point by having C repeat them back. For example, say, "Okay, here's the nice bird—do we listen to what he tell us? "**Now let's practice. This is the good bird.**" Give a command with the bird—C should follow this command (like touch your nose, touch your belly, wave your hands). If C does not, repeat the practice trial with another command until C follows it correctly. "**Good—you did what the nice bird said to do! That's right!**"*

*Once C understands the directions for the bird, explain the directions for the dragon. "**This dragon is mean. (Hold up dragon puppet.) So when he talks to us we're not going to listen to him** (E should shake her head "no" when saying "not going to him"). **We will just stay still and not move"** Make sure C understands the directions at this point by having C repeat them back. For example, say, "Okay, what about the mean dragon—do we listen to him?" "**Now let's practice. This is the mean dragon.**" Give a command with the dragon—C should NOT follow the command. If C follows the command, repeat the practice trial with another command until C does NOT follow it. If C is having difficulty understanding the directions for dragon, E may have to gently restrain C from following the commands during the practices. For example, make the dragon say, "Touch your nose." while gently holding C's hands down with your other hand in order to prevent C from touching his/her nose. When C does NOT follow the command, say, "**Good—you DIDN'T do what the mean dragon said to do! That's right!**"*

During the practice and real trials, E makes the puppets "talk." During the "training" segment, E may raise the puppet she is "talking" with, for

emphasis, and lower the other puppet. E may also give the commands more slowly in order to allow C to respond during the practice trials. During real trials both puppets must be held up at the same level. During real trials, E should give each command and then wait 2-3 seconds before giving the next command. If C responds before the 2-3 seconds have elapsed, E should give the next command.

Practice Trials:

Ok, let's practice

BIRD: Touch your nose.

If C doesn't touch the nose, E says, “Remember, we listen to the nice bird and do what he says because that's how we play the game.” E then repeats this until child gets it right.

If C touches the nose, E says, “That's right! Now let's practice with the mean dragon. Let's not do what he says because he's mean.”

DRAGON: Touch your hair.

If C touches the stomach, E says, “Remember we don't like to listen to the mean dragon let's not do what he says because that's how we play the game.”

If child has serious trouble with dragon trials E should make sure to make him/her reenact the correct response, as follows:

BIRD: Move your hand. (C moves hand)

DRAGON: Move your hand.

Simultaneously E places her hand over child's to keep it immobile and says: “See, good, that's how we play. You don't do what this mean dragon tells you to do.”

When child performs correctly the dragon trial, E says: “Yeah! That was fun. Let's play for real now.”

Real trials

Hold both puppets up at the same level, do not change their locations, move only their mouths, and give the commands without changing voice or facial

expression, pausing 2-3 seconds between each command (unless c responds earlier).

BIRD : Stick out your tongue.

DRAGON : Touch your teeth.

DRAGON : Touch your ears.

BIRD : Wiggle your fingers.

DRAGON : Wiggle your fingers.

DRAGON : Touch your eyes.

Remember the way we play this game, we do what the bird tells us to do but we don't do what the dragon tells us to do.

DRAGON : Touch your hair..

BIRD : Touch your nose.

DRAGON : Touch your nose.

BIRD : Close your eyes.

DRAGON : Touch your chin.

BIRD : Touch your head.

After completing the real trials, E should tell C what a good job s/he did.

APPENDIX E

CONTINUOUS PERFORMANCE TASK (CPT)

We're going to play a couple of fun computer games. For playing these games, you can earn prize cash (show C a prize cash coupon). At the end of the games, you can trade in all your prize cash for some prizes. The more prize cash you earn, the better prizes you can get, so try to earn as much prize cash as you can!

Now, here's a fun computer game! I'll teach you how to play. This game is called "Catch the Fish". *Show the laminated picture with the clipart. Point to the fish. That's right that's the fish! In this game, you will look at the screen and you'll see different pictures. Each time you see the FISH, push this button (point to space bar) one time as fast as you can, just like this. Demonstrate. If you see a picture that isn't a fish, you DON'T do anything. Show C how to rest a hand near the spacebar with the index finger resting on the spacebar. BE CAREFUL to leave your hand above the spacebar as you push it, not withdrawing your hand, so that C will see to keep a hand in the ready to push position. See how I rest my hand next to the button and I leave it there so that I am always ready to push the button when I see the FISH? I have my other hand in my lap? Now you try? Which hand do you want to push with? Let C choose which hand. Ok, put your other hand in your lap. Show me how you push the button! If child press bar correctly, say **Right**. Emphasize a quick, single push of the spacebar. Some C's may want to push it repeatedly or hold it down, so reinforce correct pressing.*

Let's practice first to make sure you know how to play. Remember, whenever you see the FISH, push the button one time as fast as you can to catch it. When you see a different picture, do not push the button. Now, when do you push the button? Allow C to respond ensuring that C understands when to push the button. Right! Only when you see the FISH! And what do you do when you see other

pictures? Allow C to respond ensuring that C understands when to push the button.

Right! You don't push the button for any other pictures, just the FISH. Watch the screen!

*Start the practice program by clicking TAB and then ENTER. These pictures go much slower to give you some time to give feedback to C. You may have to physically hold C's hands during the non-fish pictures to make sure they understand. If they push during non-fish pictures, say **Remember, only push the button when you see a fish.***

*When a fish comes up, see if C pushes and if not, say, **It's a fish! Push the button!** Don't give any other feedback (e.g., have you ever seen a fish?) or be chatty with the kid, but just be sure they understand the game. When C makes a correct catch, press close.*

*If C loses attention, say, **Keep looking at the screen or you might miss a fish.** If C clearly did not understand the practice trials, you can re-run the practice program to try again.*

Great job! Take the cardboard off and type in C's ID. **DON'T** press "start" yet or it will mess up their response times. Place the cardboard on the computer. **Now, let's play for real! When you were doing the practice game, I helped you a little and talked to you a little. For the real game, the pictures are going to come up really fast and the rule is that I can't help you. I'm going to let you do it all by yourself. Okay? Now, when do you push the button? Allow C to respond. Right! Only when you see the FISH! Remember, whenever you see the FISH, press the button as fast as you can. Watch the screen.** Start the real program by clicking TAB and then ENTER Sit behind C so that they can't interact with you easily. If C looks to you or speaks to you, look at the screen where the pictures are appearing.

*If C loses attention, say, **Keep looking at the screen or you might miss a fish.***

You may only prompt C 2 times and it must be within the first 2 minutes of the real game.

If C still wants to quit, press CLOSE button.

*When the game ends say, **Great job! You did so well! Since you caught so many fish, I'm going to give you five prize points. Pull out a 5-prize note, but don't give to C. We're going to play another game now, so I'll hold onto your prize cash , and after we play this next game, you can turn all of your prize cash in for prizes.***

APPENDIX F
CHILD BEHAVIOR QUESTIONNAIRE (CBQ) AND ACTIVATION
CONTROL SUBSCALE

Reporter	Reverse	Scale
		Activation control
P, T, O		Can make him/herself do an important task, even when s/he wants to play.
P, T, O		Can say hello to a new child in class, even when feeling shy.
P, T, O	R	Has a hard time speaking when scared to answer a question.
P, T, O		Can make him/herself run fast, even when tired.
P, T, O	R	Has a hard time making him/herself clean up after an activity.
P, T, O	R	Has a hard time working on an assignment s/he finds boring.
P, T, O	R	Does a fun activity when s/he is supposed to do a less appealing activity instead.
P, T, O		Can apologize or shake hands after a fight.
P, T, O		Can make him/herself pick up something dirty in order to throw it away.
P, T, O	R	Has a hard time getting going (moving) when tired.
P, T, O		Can make him/herself smile at someone, even when s/he dislikes them.
P		Can take a band-aid off when needed, even when painful.
P		When a child is left out, can ask that child to play.
<i>Dropped</i>		Can make him/herself take medicine or eat food that s/he knows tastes bad.
<i>Dropped</i>		Can make him/herself get out of bed, even when tired.
		Anger/Frustration
P, T, O		Gets angry when told s/he has to remain still during rest time or other times s/he is supposed to sit still (e.g., story time).
P, T, O		Has temper tantrums when s/he doesn't get what s/he wants.
P, T, O		Gets quite frustrated when prevented from doing something s/he wants to do.
P, T, O		Gets angry when s/he can't find something s/he wants to play with.

Reporter	Reverse	Scale
P, T, O	R	Rarely gets upset when told s/he has to remain quiet during rest time or other times s/he is supposed to sit still (e.g., story time).
P, T, O		Gets angry when called away from an activity or game before s/he is ready to quit.
Attention Focusing		
P, T, O	R	When practicing an activity, has a hard time keeping her/his mind on it.
P, T, O	R	Will move from one task to another without completing any of them.
P, T, O		When drawing or coloring in a book, shows strong concentration.
P, T, O		When building or putting something together, becomes very involved in what s/he's doing, and works for long periods
P, T, O	R	Is easily distracted when listening to a story.
P, T, O		Sometimes becomes absorbed in a picture book and looks at it for a long time.
Attentional Shifting		
P, T	R	Is hard to get his/her attention when he/she is concentrating on something.
P, T		Can easily shift from one activity to another.
P, T	R	Has a lot of trouble stopping an activity when called to do something else.
P, T		Has an easy time leaving play to do another activity.
P, T	R	Has a hard time shifting from one activity to another.
P, T		Is good at games with rules, such as card games.
P, T	R	Often doesn't seem to hear me when s/he is working on something.
P, T	R	Needs to complete one activity before being asked to start on another one.
P, T	R	Seems to follow his/her own direction, even when asked to do something different.
P, T		Can easily leave off working on a project if asked.

Reporter	Reverse	Scale
Inhibitory Control		
P, T, O		Plans for new activities or changes in routine to make sure s/he has what will be needed.
P, T, O		Can wait before entering into new activities if s/he is asked to.
P, T, O	R	Has trouble sitting still when s/he is told to (story time, etc.)
P, T, O		Is good at following instructions.
P, T, O		Approaches places that s/he thinks might be "risky" slowly and cautiously.
P, T, O		Can easily stop an activity when s/he is told "no."
Sadness		
P, T, O		Cries sadly when a favorite toy gets lost or broken.
P, T, O		Tends to become sad if plans (for a special event or activity) don't work out.
P, T, O		Seems to feel depressed when unable to accomplish some task.
P, T, O		Becomes upset when friends are getting ready to leave the classroom.
P, T, O	R	Rarely cries when s/he hears a sad story.
P, T, O	R	Rarely becomes upset when listening to a sad story.
P, T, O	R	Rarely becomes discouraged when s/he has trouble making something work.
Shyness		
P, T, O	R	Seems to be at ease with almost any person.
P, T, O		Is sometimes shy even around people s/he has known a long time.
P, T, O		Sometimes seems nervous when talking to adults s/he has just met.
P, T, O		Acts shy around new people.
P, T, O	R	Is comfortable asking other children to play.
P, T, O		Sometimes turns away shyly from new acquaintances.

Reporter	Reverse	Scale
Smiling/ Laughter		
P, T, O	R	Enjoys funny stories, but usually doesn't laugh at them.
P, T, O	R	Hardly ever laughs out loud during play with other children.
P, T, O		Sometimes smiles or giggles when playing by her/himself.
P, T, O		Smiles a lot at people s/he likes.
P, T, O		Often laughs out loud in play with other children.
P, T, O	R	Rarely laughs aloud in the classroom.

Child Behavior Questionnaire – Parent Version

On the next pages you will see a set of statements that describe children's reactions to a number of situations. We would like you to tell us what this child's reaction is likely to be in those situations. There are of course no "correct" ways of reacting; children differ widely in their reactions, and it is these differences we are trying to learn about. Please read each statement and decide whether it is a "true" or "untrue" description of this child's reaction within the past six months.

	Extremely Untrue	Quite Untrue	Slightly Untrue	Neither True nor False	Slightly True	Quite True	Extremely True
1. Is hard to get his/her attention when he/she is concentrating on something.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Gets angry when told s/he has to go to bed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Is afraid of burglars or the "boogie man."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Cries sadly when a favorite toy gets lost or broken.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Usually rushes into an activity without thinking about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Seems to be at ease with almost any person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Can make him/herself do homework, even when s/he wants to play.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. When practicing an activity, has a hard time keeping her/his mind on it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Can easily shift from one activity to another.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Enjoys funny stories, but usually doesn't laugh at them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Will move from one task to another without completing any of them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Has temper tantrums when s/he doesn't get what s/he wants.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Tends to become sad if the family's plans don't work out.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Extremely Untrue	Quite Untrue	Slightly Untrue	Neither True nor False	Slightly True	Quite True	Extremely True
14. Is afraid of loud noises.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Has a lot of trouble stopping an activity when called to do something else.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. When drawing or coloring in a book, shows strong concentration.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Can say hello to a new child in class, even when feeling shy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Is sometimes shy even around people s/he has known a long time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Has a hard time speaking when scared to answer a question.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Prepares for trips and outings by planning things s/he will need.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Sometimes seems nervous when talking to adults s/he has just met.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. Gets quite frustrated when prevented from doing something s/he wants to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Hardly ever laughs out loud during play with other children.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. Seems to feel depressed when unable to accomplish some task.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. Is not afraid of the dark.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. Can take a band-aid off when needed, even when painful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. Often rushes into new situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. When building or putting something together, becomes very involved in what s/he's doing, and works for long periods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Extremely Untrue	Quite Untrue	Slightly Untrue	Neither True nor False	Slightly True	Quite True	Extremely True
29. Can make him/herself run fast, even when tired.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. Can wait before entering into new activities if s/he is asked to.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. Has a hard time making him/herself clean own room.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. Has an easy time leaving play to do another activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33. Sometimes smiles or giggles when playing by her/himself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. Takes a long time in approaching new situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. Becomes upset when loved relatives or friends are getting ready to leave following a visit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36. Gets angry when s/he can't find something s/he wants to play with.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
37. Is easily distracted when listening to a story.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38. When a child is left out, can ask that child to play.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39. Acts shy around new people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
40. Has trouble sitting still when s/he is told to (at movies, church, etc.).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41. Has a hard time shifting from one activity to another.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42. Is afraid of fire.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
43. Rarely cries when s/he hears a sad story.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
44. Is good at games with rules, such as card games.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
45. Smiles a lot at people s/he likes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Extremely Untrue	Quite Untrue	Slightly Untrue	Neither True nor False	Slightly True	Quite True	Extremely True
46. Rarely gets upset when told s/he has to go to bed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
47. Has a hard time working on an assignment s/he finds boring.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
48. Is comfortable asking other children to play.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
49. Is slow and unhurried in deciding what to do next.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
50. Often doesn't seem to hear me when he/she is working on something.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
51. Sometimes becomes absorbed in a picture book and looks at it for a long time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
52. Sometimes turns away shyly from new acquaintances.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
53. Rarely becomes upset when watching a sad event in a TV show.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
54. Is afraid of the dark.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
55. Does a fun activity when s/he is supposed to do homework instead.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
56. Tends to say the first thing that comes to mind, without stopping to think about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
57. Needs to complete one activity before being asked to start on another one.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
58. Is good at following instructions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
59. Often laughs out loud in play with other children.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
60. Approaches places s/he has been told are dangerous slowly and cautiously.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Extremely Untrue	Quite Untrue	Slightly Untrue	Neither True nor False	Slightly True	Quite True	Extremely True
61. Seems to follow his/her own direction, even when asked to do something different.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
62. Can apologize or shake hands after a fight.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
63. Can easily stop an activity when s/he is told "no."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
64. Gets angry when called in from play before s/he is ready to quit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
65. Is rarely frightened by "monsters" seen on TV or at the movies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
66. Rarely becomes discouraged when s/he has trouble making something work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
67. Rarely laughs aloud while watching TV or movie comedies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
68. Can make him/herself pick up something dirty in order to throw it away.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
69. Is among the last children to try out a new activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
70. Has a hard time getting going(moving) when tired.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
71. Can easily leave off working on a project if asked.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
72. Can make him/herself smile at someone, even when s/he dislikes them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Child Behavior Questionnaire – Teacher and Observer Version

On the next pages you will see a set of statements that describe children's reactions to a number of situations. We would like you to tell us what this child's reaction is likely to be in those situations. There are of course no "correct" ways of reacting; children differ widely in their reactions, and it is these differences we are trying to learn about. Please read each statement and decide whether it is a "true" or "untrue" description of this child's reaction within the past six months.

	Extremely Untrue	Quite Untrue	Slightly Untrue	Neither True nor False	Slightly True	Quite True	Extremely True
1. Is hard to get his/her attention when he/she is concentrating on something.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Gets angry when told s/he has to remain still during rest time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Cries sadly when a favorite toy gets lost or broken.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Usually rushes into an activity without thinking about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Seems to be at ease with almost any person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Can make him/herself do an important task, even when s/he wants to play.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. When practicing an activity, has a hard time keeping her/his mind on it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Can easily shift from one activity to another.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Enjoys funny stories, but usually doesn't laugh at them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Will move from one task to another without completing any of them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Has temper tantrums when s/he doesn't get what s/he wants.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Extremely Untrue	Quite Untrue	Slightly Untrue	Neither True nor False	Slightly True	Quite True	Extremely True
12. Tends to become sad if plans (for a special event or activity) don't work out.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Has a lot of trouble stopping an activity when called to do something else.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. When drawing or coloring in a book, shows strong concentration.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Can say hello to a new child in class, even when feeling shy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Is sometimes shy even around people s/he has known a long time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Has a hard time speaking when scared to answer a question.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Plans for new activities or changes in routine to make sure s/he has what will be needed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Sometimes seems nervous when talking to adults s/he has just met.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Gets quite frustrated when prevented from doing something s/he wants to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Hardly ever laughs out loud during play with other children.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. Seems to feel depressed when unable to accomplish some task.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Often rushes into new situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Extremely Untrue	Quite Untrue	Slightly Untrue	Neither True nor False	Slightly True	Quite True	Extremely True
24. When building or putting something together, becomes very involved in what s/he's doing, and works for long periods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. Can make him/herself run fast, even when tired.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. Can wait before entering into new activities if s/he is asked to.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. Has a hard time making him/herself clean up after an activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. Has an easy time leaving play to do another activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. Sometimes smiles or giggles when playing by her/himself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. Takes a long time in approaching new situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. Becomes upset when friends are getting ready to leave the classroom.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. Gets angry when s/he can't find something s/he wants to play with.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33. Is easily distracted when listening to a story.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. Acts shy around new people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. Has trouble sitting still when s/he is told to (story time, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36. Has a hard time shifting from one activity to another.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
37. Rarely cries when s/he hears a sad story.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38. Is good at games with rules, such as card games.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Extremely Untrue	Quite Untrue	Slightly Untrue	Neither True nor False	Slightly True	Quite True	Extremely True
39. Smiles a lot at people s/he likes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
40. Rarely gets upset when told s/he has to remain quiet during rest times.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41. Has a hard time working on an assignment s/he finds boring.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42. Is comfortable asking other children to play.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
43. Is slow and unhurried in deciding what to do next.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
44. Often doesn't seem to hear me when s/he is working on something.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
45. Sometimes becomes absorbed in a picture book and looks at it for a long time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
46. Sometimes turns away shyly from new acquaintances.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
47. Rarely becomes upset when listening to a sad story.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
48. Does a fun activity when s/he is supposed to do a less appealing activity instead.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
49. Tends to say the first thing that comes to mind, without stopping to think about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
50. Needs to complete one activity before being asked to start on another one.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
51. Is good at following instructions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
52. Often laughs out loud in play with other children.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Extremely Untrue	Quite Untrue	Slightly Untrue	Neither True nor False	Slightly True	Quite True	Extremely True
53. Approaches places that s/he thinks might be "risky" slowly and cautiously.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
54. Seems to follow his/her own direction, even when asked to do something different.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
55. Can apologize or shake hands after a fight.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
56. Can easily stop an activity when s/he is told "no."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
57. Gets angry when called away from an activity or game before s/he is ready to quit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
58. Rarely becomes discouraged when s/he has trouble making something work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
59. Rarely laughs aloud in the classroom.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
60. Can make him/herself pick up something dirty in order to throw it away.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
61. Is among the last children to try out a new activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
62. Has a hard time getting going(moving) when tired.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
63. Can easily leave off working on a project if asked.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
64. Can make him/herself smile at someone, even when s/he dislikes them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX G
DEMOGRAPHICS

Today's Date: ____/____/2009

1. How would you describe your child's ethnicity/race?

****PLEASE CHECK ALL THAT APPLY****

White/Caucasian (non-Hispanic)

Mexican American/Hispanic

Please Specify:

Hispanic/White

Hispanic/Indian

Hispanic/Black

African American

Asian or Pacific Islander

Native American

Other/Mixed _____

4c. Have you ever been:

Divorced

Widowed

Neither

2. What month and year was your child born?

Month: _____ Year: _____

3. What is your relationship to this child?

Mother

Father

Stepmother

Stepfather

Grandmother

Grandfather

Other _____

4a. What is your current marital status?

Single

Cohabiting (living together, but not married)

Married

4b. If cohabiting or married, does your child live with both biological parents?

Yes

No

Not applicable

5. What is your annual combined family income (before taxes, not including any welfare or food stamps)?
- Less than \$15,000
 - \$15,000- \$30,000
 - \$30,000-\$45,000
 - \$45,000-\$60,000
 - \$60,000-\$75,000
 - \$75,000-\$100,000
 - Over \$100,000
- 6a. What is the highest level of education you have completed?
- Less than high school
 - High school graduate
 - Some college or two-year college
 - College graduate (four-year college)
 - Master's degree
 - Ph.D., J.D., or M.D.
- 6b. What is the highest level of education this child's other biological parent has completed?
- Less than high school
 - High school graduate
 - Some college or two-year college
 - College graduate (four-year college)
 - Master's degree
 - Ph.D., J.D., or M.D.

APPENDIX H
GIFT WRAP

GIFT WRAP CODE SHEET

ID# _____

DVD#

Date _____

Coder

M r

Latency to 1st peek over shoulder (sec) _____

Latency to 1st turn body around (sec) _____

Total # of peeks during entire segment _____

Strategies:

- Child turns around and does not turn back 1
- Child turns around and turns back 2
- Child looks over shoulder enough to see 3
- Child turns head to side but not over 90° 4
- Does not try to peek 5

Did task end early?

No

Yes

Quality:

0
Not Usable

1
Usable

Overview of the Task

This task involves Experimenter (E) pretending to wrap a present for Child (C) by playing a game, asking the child “not to peek”. The E will wrap the gift behind the child making lots and lots of noise, so it’s tempting for the kid to peek. Then, the E will move the table so that we get a side view of the child (we need to see his/her hands and the gift on the videotape) and give the child the gift.

Materials Needed:

- A plain brown bag filled with tissue paper and empty grocery bags.
- One stop-watch.
- One gift bag
- A toy in the gift bag (fingerpuppet).

Videotaping Instructions

For the gift wrapping, we need to see the child with a straight on view (we need to clearly see if the child is peeking at the E wrapping the gift). So we need to see upper body and face.

Script

— *Please follow script exactly* —

Position the child first in the chair. The child should be facing the camera person sitting in a seat with the table in front of him/her. Make sure the child is facing forward before starting the instructions.

“You have been doing such a great job with these games, I have a surprise for you! I have it right here, but I want to wrap it first. Let’s make it

a game. You sit in your chair and look straight ahead, and I'll wrap your present for you. Try not to look!"

E should then walk behind C with the brown bag containing the wrapping and the prize already in its box; Start stop-watch as you start to noisily swish tissue paper and wrapping around, pretending to wrap the prize. Keep an eye on the child to watch for peeks.

If the child is peeking, you can remind C up to 2 times as necessary not to peek. Do not use these reminders if the child is not peeking and you can ONLY remind up to 2 items. If C peeks, say "Try not to ruin my surprise! In this game, we try not to peek!**"*

After 1 minute of making lots of noise with the gift, stop wrapping and walk to the front of C, holding gift box (the gift should be inside) in front of C.

"Okay, I'm all finished! Here's your present!"

APPENDIX I
KNOCK TAP

ID#: _____ DVD#: _____
 Coder: _____ Date: ____ / ____ / 2009

	1			2			3			Main			Reliability		
Understanding	<input type="radio"/>			<input type="radio"/>			<input type="radio"/>			<input type="radio"/>			<input type="radio"/>		
	C	I	NR	L1	L2	L3		C	IC	NR	L1	L2	L3		
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	17	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	18	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	19	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	20	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	21	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	22	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	23	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	24	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		

	1	2	3	4	5
Activity Level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Engagement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Pace	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Task Quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Notes:

Here's a really fun game! Put one hand in your lap and hold up your other hand. Watch me: When I knock on the table like this (*demonstrate how to knock by knocking once with knuckles on the table as you would knock on the door*) **I want you to knock on the table too** (*Knock, and have C knock*). **Let's practice! When I do this <knock>, what do you do?** *If C doesn't get it, repeat instructions and try another practice trial.*

Then when I tap on the table like this (*Demonstrate how to tap by tapping once with flat open palm of hand on the table*), **I want you to tap too.** **Let's practice! When I do this <tap>, what do you do?** *If the kid gets it, then you can move on to the imitate trials. If not, you can practice knocking and tapping 2 more times.*

Okay, let's start the game!

Now start on the 8 imitate trials. The knocking and tapping ought to occur about 2-3 seconds apart (in other words, don't go too fast and give the child a chance to respond). It is important that the E goes at the same pace throughout the trials (don't slow down just because the kid is having trouble).

That was really fun! Now we're going to play the game a different way! This way is pretty tricky. This time, when I knock on the table, (*Demonstrate knocking*). **I want you to tap on the table. Let's practice! When I do this <knock>, what do you do?** *If C doesn't get this at first, repeat the instructions and try another practice trial. You can also demonstrate with your other hand having one knock and the other one tapping. If C doesn't get this after the second time, E should physically help the child to do this (have the C tap).*

OK, now when I tap on the table (*Demonstrate tapping*), **I want to you to knock on the table. Let's practice! When I do this <tap>, what do you do?** *If C doesn't get this at first, repeat the instructions and try another practice trial. You can also demonstrate with your other hand having one knock and the other one tapping. If C doesn't get this after the second time, E should physically help the child to do this (have the C tap).*

If C doesn't understand, give up to 6 practice trials. If at that point the child still doesn't understand, start the game anyway.

Okay, let's start the game! *Proceed to perform 8 real opposite trials. It is important that the E goes at the same pace throughout the trials (don't slow down just because the kid is having trouble).*

Wow! That was really hard! You did a great job!

Order of trials:

1. Knock
2. Knock
3. Tap
4. Tap
5. Tap
6. Knock
7. Tap
8. Knock

APPENDIX J
NATURALISTIC OBSERVATION

scanID

Scan # Participant #

Yr Mon Day
Date (Y-M-D)

<coderID --get from list>

Coder

site
 2 CDL
 3 CoE
 1 CS

setting
 1 In side
 2 Out side

time
 1 AM
 2 PM

	None 0	Min 1	Mod 2	Strong 3	Emotions -rate all
Em_pos	<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	Positive Emotion
Em_ext	<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	Anger/ Frustration
Em_int	<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	Sadness/ Anxiety /Fear
Em-oth	<input type="radio"/> 0	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	Other Negative Emotion

If selected, enter 888 for "tech difficulty" Can't code

Peer Play Interactions

Peer characteristics:

peers
 3 Mixed
 2 Opposite
 1 Same
 0 Can't code/N/A

Aggression

Role:

AgRole
 3 Both
 2 Aggress or
 1 Target
 0 None

AgVer
 0 Verbal/Insults
 1 Physical

AgPhy
 0 Physical
 1 Physical

AgRel
 0 Relational/Exclusion
 1 Relational/Exclusion

AgPrp
 0 Destruction of property
 1 Destruction of property

Bid
 0 Unsucc Soc Bid?
 1 Unsucc Soc Bid?

AdPres
 0 Adult Present?
 1 Adult Present?

SemStr
 0 Semi-structured Time?
 1 Semi-structured Time?

If victim, who aggressed?

AgPeer
 Enter ID number, if approp.
 (last name and initials)
 2 = non-participating peer
 0 = none or n/a
 888 = tech difficulty (i.e., can't see/code)
 999 = missing info (i.e., if skipped the Q)

Overarching codes
 0 = none or n/a
 777 = missing emotion & play codes on PINK sheets
 888 = technical difficulty (if coder said doesn't know)
 999 = missing data (i.e., if coder doesn't answer) or multiple answers

Calculating the **scanID**

Compute scanID = ID*1000000000 + coderID*100000000 + mon*1000000 + day*10000 + time*1000 + scan.

e.g., For Scan #54, Child #1234, on May 6, in the morning, by observer#11

Compute scanID = ID(1234)* 1000000000+ coderID(11)* 100000000 + mon(05)*1000000+ day(06)*10000+ time(1)*1000 + scan(54)

$$\begin{aligned}
 &= 1234000000000 + 110000000 + 500000 + 6000 \\
 + &1000 + 54 \\
 &= 1234000000000 \\
 &\quad 110000000 \\
 &\quad\quad 500000 \\
 &\quad\quad\quad 6000 \\
 + &\quad\quad\quad\quad 1000 \\
 &\quad\quad\quad\quad\quad 54 \\
 &= 12341105061054
 \end{aligned}$$

Observational data will be collected using a series of 10-second observation periods (i.e., a scan) that will be collected by multiple observers across multiple days. By itself, each scan serves as a snapshot -- a 10-second window into a child's behavior; together, the series of snapshots form the equivalent of an album and provide some evidence of a child's behavioral patterns.

Coding Sheet Format

The bubble sheet is comprised of bubbles that need to be filled out in pencil. Just like a scantron sheet that you would see in an exam situation, you select one bubble in each question set and fill it in completely, and without making an unnecessary marks on the sheet (unnecessary marks cause entry problems). Observers may write a few brief notes on the bottom right corner of the scan sheet, under the final question.

For example:

None 0	Min 1	Mod 2	Strong 3	Emotions -rate all
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Positive Emotion
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Anger/Frustration
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sadness/Anxiety

The coding sheet can be conceived of as having **four general sections** (more detailed descriptions follow):

- 1) **Identifying information** -- who, what, when, where...?
- 2) **Social/play behavior** -- what kind of activity and in what circumstances?
- 3) **Affect** -- what kind of emotion, if any, is being expressed by tone of voice, facial expressions, and/or actions?
- 4) **Aggression** -- who did what to whom?

1. IDENTIFYING INFORMATION

This information is used to identify the participant and the coding circumstances. This data is hand entered data, so must be printed legibly.

- When you get the coding sheets, they should already have the *site* and *time* (i.e., whether it is morning or afternoon) filled in; please take a moment to make sure that it is and, if not, fill in the correct information. You will fill in the *setting* as you code.
- Fill in the *date* and your *name*.
- As you code, fill in the *participant ID*, which you will obtain from the *observation roster* for that day (i.e., this is the list of participants you will be observing that day), and the *scan number*. The scan number is the order in which the observations were recorded; the scans (whether regular scans or aggression scans) should be numbered consecutively started with the number one (1) at the beginning of each coding session.

2. PEER PLAY BEHAVIOR

Based on the 10-second scan, you will identify one predominant code. When coding *peer play*, remember:

- For each 10 second scan, identify only ONE code.
- If there is more than one activity, code the most predominant activity that occurred. Sometimes it can be helpful to consider the 10-second scan holistically.
- If two behaviors occurred for exactly the same amount of time (5 seconds each), then code the higher level of play behavior (the levels are ordered from highest to lowest in the table provided below; i.e., the highest level is social).
- Do not code during teacher-directed group activities (i.e., when a teacher is leading the group in an activity which the children are not free to leave, such as calendar time).

The following behavior codes are based on the work of Coplan, Rubin, and colleagues (1994, 2004, 2008)

<p>Social [S]</p>	<p>Social interaction <u>with a peer</u>. The target child [C] is interacting with or engaged with other children, where they are focused on the same activity and/or playing together. This includes shared attention and/or coordinated activity. Social behavior may be positive or negative in nature. The key characteristic is that the C is <i>interacting with their peers</i>, <u>not</u> merely doing something simultaneously.</p> <p>E.g., interactive play, pretend play with at least one peer, working together with blocks, creating an art project together, borrowing or lending toys (more than one time), passing things between each other, following or leading one another in activities, hugging, pushing, tickling, talking, intent listening, reading a story to other children, carrying a bucket together, and/or turn taking.¹</p> <p><i>**A C's act may be considered social regardless of whether or not the other child responds if C keeps trying to interact.</i></p> <p>¹Turn-taking is not merely one child doing an action after another; it requires intentional waiting for the other child to finish their turn.</p>
<p>Parallel [P]</p>	<p>C is near the other children doing the same activity but not interacting with them. C plays alone but with materials similar² to those being used by other children or in a manner that mimics the behavior of other children. E.g., two children sitting at the same table quietly doing separate puzzles, drawing, etc., but <u>not</u> interacting with each other about the task.</p> <p><i>*Exclusionary criteria: It is <u>not</u> parallel play if the C is sitting with his/her back to the other children or if they are not in each other's proximity.</i></p> <p>²The toys/activities have to be similar in nature but do not have to be identical (e.g., drawing and paper maché are similar, but drawing and playing with cars is not).</p>
<p>Solitary Constructive [SC]</p>	<p>C engages <u>alone</u>³ in constructive activity/play and shows little regard for the activities of other people. If other kids are close, this code is used when the C is facing away from the children and/or clearly engaged in a different activity from them.</p> <p>E.g., C may be coloring, painting, reading a book, putting a</p>

	<p>puzzle together, watching TV, playing with blocks alone, building with tinker toys, setting up train tracks, at the computer alone, going down a slide, singing and dancing, or engaged in goal-directed pretend play such as dressing like a doctor and operating on a toy.</p> <p>³<i>Alone here refers to play behavior, <u>not</u> the proximity of other people.</i></p>
<p>Solitary Non-constructive [SN]</p>	<p>C is engaged in repetitive, non-constructive activity alone, with or without objects. The repetitive activity has no purpose save for sensation seeking.</p> <p>E.g., solitary, repetitive pretend play (e.g., running around in circles pretending to be a superhero or animal), atypical repetitive behavior (e.g., rocking back and forth), or aimless talking to oneself.</p> <p><i>**This is a rare play behavior that is best characterized by the behavior of autistic children.</i></p> <p><i>*Exclusionary criteria:</i> If the C is using a toy as it is intended to be used or if it is a goal-directed, constructive activity. Also, if the SN behavior is secondary (i.e., the child is not focusing on the activity, but doing it absent-mindedly) and/or if the child is not engaged in any kind of activity [this would be U].</p>
<p>Onlooker [O]</p>	<p>C is observing <u>other children</u> doing an activity but is not involved in the activity. C appears to be alert to the activity of the peers, but does <u>not</u> participate directly in play behavior with them.</p> <p><i>*An onlooker may ask other children questions, but there is insufficient social activity to justify a higher code.</i></p> <p><i>*C's active interest in other children's play distinguishes onlooker play from unoccupied play.</i></p> <p><i>*Exclusionary criteria:</i> C wandering from one center to another would <u>not</u> be coded here.</p>
<p>Unoccupied [U]</p>	<p>C is not engaged in any activity beyond sitting alone or wandering around the room. Behavior is characterized by a lack of focus or intent. C is not alert to any particular activity around him/her. C may stand in one spot, look around the room aimlessly, or perform random movements that do not seem to have a goal. By definition, C is not engaged in a task.</p>
<p>Teacher-oriented [TO]</p>	<p>C is voluntarily involved in some activity/interaction with the teacher that is informally organized (i.e., <u>not</u> a structured class activity).</p> <p>E.g., talking to teacher, going to get teacher, watching the teacher, sitting with the teacher, or doing an activity with the teacher.</p> <p><i>*Exclusionary criteria:</i> Do <u>not</u> code if the C isn't attending to (i.e., watching, interacting with, or listening to) the teacher.</p>
<p>None [N]</p>	<p>C not engaged in play. C is engaged in a functional activity (e.g., tying shoes, washing hands, cleaning, and looking for materials), or transitioning from one activity to another.</p> <p><i>*This is clearly distinguished from wandering--child is purposely going some place.</i></p>

When you are trying to distinguish between these different codes, it is helpful to keep three questions in mind:

- Is the child engaged with others or engaged in solitary play?
- Is the activity play-like in nature?
- Is it constructive or goal-directed?

Coding Decision Tree

Q1. Is the child engaged with/near other children or engaged in solitary behavior?					
(as opposed to teacher-oriented or functional activities)					
<i>With/near other children</i>			<i>Solitary</i>		
Q2. Is the child actively engaged with a peer?			Q2. Is the child engaged in play-like behavior?		
<i>Yes</i>		<i>No, But is playing with similar materials in proximity of other children</i>	<i>Yes</i>		<i>No, Seems to be standing/sitting there</i>
			Q3. Is it constructive?		Q3. Were they attending to anything in particular?
			<i>Yes</i>	<i>No, Engaged in atypical self-stimulation</i>	<i>Yes, Watching peers play</i>
			<i>~> Solitary Constructive [SC]</i>	<i>~> Solitary Non-Constructive [SN]</i>	<i>No, Appears without aim</i>
<i>~> Social [S]</i>		<i>~> Parallel [P]</i>			<i>~> Onlooker [O]</i>
					<i>~>Unoccupied [U]</i>

_____ *These 4 are all play behaviors* _____

Other features of the peer-play interactions that need to be coded (and are described in more detail below) are:

- the sex of the peers with whom the C is engaged in social and parallel play, if appropriate; and
- whether the C made an unsuccessful social bid;
- whether an adult was present; and
- whether it occurred during semi-structured time.

Peer Characteristics - Sex

When the C is engaged with peers in social or parallel play, code peer characteristics; otherwise mark N/A.

When the peer code is S, the sex of peers is based on with whom the C engages--either in direct interaction or clearly engaged in the same coordinated social activity. When the peer code is P, the sex of peers is based on which children are engaged in an analogous activity in the same general area as the C. Given the sex of the target child, identify the sex of the child(ren) with whom s/he is interacting by filling in the appropriate bubble:

- **Same Sex** - child is playing with child(ren) of the same sex, but none of the opposite sex
- **Mixed Sex** - child is playing with at least one boy and at least one girl at any point during the scan

- **Opposite Sex** - child is playing with child(ren) of the opposite sex, but none of the same sex
- **Can't Code/N/A** - the C is not engaged in social or parallel play, or if you were unable to determine the sex of the other child.

Was there an unsuccessful social bid?

Indicate yes or no. This should be marked *yes* only when, in that 10-second scan: (1) the C was engaged in a clear and unmistakable attempt to be social with another child (i.e., more than just a 'hey!'), and (2) the other child actively ignored or rejected the child's bid for interaction (as opposed to not noticing it).

This code should not be used when the other child merely didn't have an opportunity to respond within the 10 seconds or if there is a reasonable chance that s/he didn't hear/notice the C's social bid.

*Note: The C may engage in an unsuccessful social bid regardless of whether the play is coded as social.

Group Characteristics - Adult present?

Indicate (i.e., yes or no) whether an adult (i.e., teacher, teacher aide, or non-parent volunteer) is present. It is not sufficient merely for the adult to be nearby; an adult is considered present if s/he is engaged with the C or group process (i.e., interacting or actively observing and not merely briefly nearby) and/or if the C has reason to believe the adult could observe his/her behavior. This code is independent of whether the C is teacher oriented; accordingly, the adult may be present and engaging in the same activity as the child or watching the child (i.e., considered present) even though the child is not teacher oriented, and vice versa.

** Please see the caveat, below about coding when the adult is the C's parent.

Group Characteristics - Semi-structured time?

Indicate (i.e., yes or no) whether the C is engaged in a semi-structured activity, i.e., where there is a group activity that is teacher-directed but the C is still free to engage with others such as:

- **Snack time**--when the C is sitting at the table as part of a semi-structured activity (e.g., at the CSL or CoE in the morning) or at the snack center (e.g., at the CDL or CoE in the afternoon);
- **Clean-up time**;
- **Reading time** (i.e., when everyone is expected to read, but not when the teacher is reading to a few children during free-play);
- **Tending to, or watching, pets.**

*IMPORTANT CAVEAT: During semi-structured situations, you may code the C's activity as either *social* (i.e., if the C is interacting with peers, as described above) or *none* (i.e., all other activities). No other codes are relevant during semi-structured activities. The only exception to this is when the class is engaging in a semi-structured activity, but the C is disengaged from this; in such a case, indicate

that it was a semi-structured time but using whatever play code best describes the C's activities.

SOME PROVISOS, CAVEATS, AND OTHER IMPORTANT DETAILS...

****If the teacher disrupts the C's play behavior**, code *as if* the C had an opportunity to carry through that same activity for more than 5 seconds (i.e., if the C was being social and the teacher told the C to go clean up after 3 seconds, you may still code this interaction as social because the C is expected to comply with the teacher's directions.)

****If the C moves completely out of sight** and you have less than 5 seconds of data, discontinue the current scan and code the next C, returning to this C at your earliest opportunity to do so (i.e., disregard the 1-4 seconds of behavior you saw and start over with a new 10-second scan). If you have at least 5 seconds of one kind of play behavior, proceed with coding as usual.

****If the C's parent is present**, do not observe the C. Instead, treat this situation as if the C has not yet been dropped off or already was picked up.

****Self-soothing behavior** (e.g., thumb sucking or twirling one's hair) **and grooming behavior** (e.g., nose picking, cleaning teeth, and rubbing eyes) are *not* play behavior. If this is the C's primary activity, the highest it may be coded is unoccupied. It may, however, be a secondary behavior that is part of a higher-coded play behavior (e.g., if the C is engaging in this behavior while onlooking or engaged in social activity). Of course, if the grooming activity is the C's sole focus (e.g., tying his/her shoes), it would be coded as [N].

**** Use the N play code sparingly.** If the C engages in any other activity, even briefly, code up to that activity.

3. AFFECT / EMOTION

The question here is whether the C is conveying any emotion--this can be through facial expressions, tone of voice, actions, body language, speech, and/or vocalizations.

Examples of some Emotion Cues:

- *Facial cues*---examples: eyes are narrowed, mouth is open and squared
- *Tone of voice*---examples: loud, harsh, subdued, whiny, shaky
- *Actions/behavior*---examples: crying, slamming first on the table
- *Body language*---examples: child's stance is angry (hands on hips, stomping), flailing limbs
- *Verbal content*---examples: child says "stop it!" loudly and harshly; naming the emotion (e.g., I'm mad at you)
- *Vocalizations*---examples: screaming, giggling

When coding affect, remember:

- Rate for EACH emotion for each 10 second scan (i.e., there could be multiple emotions).
- 2-3 seconds of data is sufficient to code for emotion.
- Coding is based on *intensity* and *duration* of each emotion.
- Concentration is not an emotion.
- Use **Can't Code** when you are not able to see any part of the child's face (i.e., not even a profile) and have no other emotion cues.

When coding, differentiate:

- was there was a real emotion? [i.e., pretend emotions --e.g., if the child is playing 'zoo' with another child and pretends to be scared of a toy lion-- shouldn't be documented]
- if so, was positive or negative?
- if negative, was the C:
 - angry or frustrated (negative-externalizing);
 - sad, anxious, or fearful (negative-internalizing); or
 - some other negative emotion (e.g., shame or disgust).

Additional information that may be helpful with identifying a C's emotions:

Angry: may have a harsh or loud tone of voice, squared mouth, flail their limbs, or state that they are mad.

Afraid: may have big eyes, talk in a shaky voice, cower or be in a fetal position.

Anxious: child may have a tense face, brow comes down, a shaky voice, tap their foot or fidget.

Sad: might have droopy cheeks, be crying, have arched eyebrows, have his/her head down and talk in a whiny voice.

Emotion cues are coded in terms of their intensity and duration on a scale of 0 (none) to 3 (strong). While the level of emotion (none, minimal, moderate, or

strong) is a holistic evaluation, the following heuristic may aid in the delineation between the levels:

- None (0) The C produces no evidence of emotion
- Minimal (1) The C produces emotion, but it is quite mild and brief (e.g., 2-3 seconds)
- Moderate (2) The C produces unmistakable emotion; it may be mild and relatively enduring or moderately strong but of short duration (e.g., 2-5 seconds)
- Strong (3) The C produces unmistakable emotion, and it is either a very strong emotional display or moderately strong but endures through most or all of the scan.

Positive Emotion	<p>Rate the degree of positive emotions (e.g., happiness, joy, excitement, pride)</p> <p>0 no evidence of positive emotions</p> <p>1 minimal evidence of positive emotions (<i>slight smile, saying "this is fun" in a soft, unexcited voice</i>)</p> <p>2 moderate evidence (<i>enduring smile or laughter, saying "this is fun" in excited voice</i>)</p> <p>3 strong evidence (<i>big/sustained smile, loud/enduring/full laughter, screaming in joy or excitement</i>)</p>
Negative Emotion - Externalizing <i>i.e., Anger, Frustration</i>	<p>Rate specifically anger or frustration as a negative emotion</p> <p>0 no evidence of anger/frustration emotions</p> <p>1 minimal evidence of anger/frustration emotions (<i>slight scowl, saying "I hate this" in a soft angry voice</i>)</p> <p>2 moderate evidence (<i>obvious, enduring anger on face or in voice, mild crying due to frustration/anger, saying "this is terrible" or "I hate you" in angry voice</i>)</p> <p>3 strong evidence (<i>loud crying or screaming in anger, angry or frustrated aggression</i>)</p>
Negative Emotion - Internalizing <i>i.e., Sadness, Anxiety, Fear</i>	<p>Rate specifically sadness or anxiety/fear as a negative emotion</p> <p>0 no evidence of sadness or anxiety emotions</p> <p>1 minimal evidence of sadness or anxiety (<i>voice or facial is minimally distressed -- e.g., slight frown or fret on face; slight frown, saying "I'm sad/lonely" in a soft but sad voice</i>)</p> <p>2 moderate evidence of sadness or anxiety/fear (<i>obvious and/or enduring sadness/fear/ anxiety on face, in behavior, or in voice; mild crying due to sadness or fear</i>)</p> <p>3 strong evidence sadness or anxiety/fear (<i>loud crying or intense fear</i>)</p>
Other Negative Emotion <i>e.g., disgust</i>	<p>Rate the degree of <i>other</i> negative emotions (i.e., <u>not</u> anger/frustration, sadness/anxiety/fear)</p> <p>0 no evidence of negative emotions</p> <p>1 minimal evidence of negative emotions (<i>voice or facial is minimally distressed, but <u>not</u> sad, anxious, angry, nor frustrated</i>)</p>

	2 moderate evidence of negative emotions (<i>obvious and/or enduring</i>)
	3 strong evidence of negative emotions (<i>signs of negative affect for the majority of the time</i>)

4. AGGRESSION

Aggression should be coded whenever it occurs, identifying the C's role (i.e., whether the C is the victim or the aggressor) and the kind of aggression.

Aggression should be differentiated from rough-and-tumble play--the latter is play behavior, whereas the former is *intended to cause harm, pain, or distress* to the recipient--typically another child, although it may also be a teacher or other adult. This code should be based on the behavior (i.e., emitting an aggressive act), *not* on the target's response to the act.

We are interested in differentiating between four kinds of aggressive acts:

physical	A child hits, pushes, shoves, etc or threatens physical harm--this can include growling menacingly at another person
verbal	A child teases (e.g., you're smelly) and/or name calls (e.g., you're a poo-poo head)
relational/ exclusion	A child tells another child to go away, says "you can't be my friend," or saying mean things about another child (e.g., gossip)
destruction of property	A child destroys another child's toy or creation (e.g., destroying a peer's block tower)

When coding verbal, physical, and relational aggression, it is important to differentiate between the mode of delivery and the kind of harm being inflicted or suggested. Physical aggression can include threats of aggression -- i.e., holding a fist in a threatening manner or telling another person that you intend them physical harm. (*Be careful to differentiate physical aggression from rough-and-tumble play -- the former includes an intention to harm another individual, the latter involves a reciprocal agreement, however implicit, to play in a particular manner.) Verbal aggression is when a person insults another person. Relational harm is when a person excludes another person, whether through physical action (e.g., a set of children close the circle so the incomer can't join them) or through words (e.g., a child tells another child that they aren't friends anymore).

EXAMPLES:

- ~If a child says to another child "I'm going to punch you in the head," this is physical aggression.
- ~If a child says to another child "You're stupid," this is verbal aggression.

~If a child says to another child “I’m not your friend any more,” or “go away,” this is relational aggression.
~If a child says/enacts all three forms of aggression, then code all three.

We are also interested in differentiating between:

- the **aggressor** (i.e., the child who produces the aggressive act) and
- the **victim** (i.e., the child who is the target of the aggressive act).

When identifying the C’s role, it can be aggressor, victim, or both (i.e., the C is an aggressor at some point in the 10-second scan and a victim at some point as well-- it need not be for equal lengths of time). If the child was not involved in aggression during the 10-second scan, mark *None*.

If the C is the victim, note the aggressor’s identity--either by noting the other child’s participant identification number or, when the other child is not a participant in the study, [N/P] for non-participant. If you do not know the other child’s identity and whether or not s/he is participating, write “do not know.” Should the aggression involve a teacher, note [T]. Do not include identifying information (e.g., names) on the coding sheets.

When the C is both the aggressor and the victim, a pink sheet (described below) may be required to adequately record the interaction. On the scan sheet, note the C’s behavior as you would normally -- the kind(s) of aggression involved, the C’s role (i.e., both), and the other child’s identity (i.e., as outlined in the previous paragraph). In addition, complete a pink sheet for the other child involved, noting these same characteristics on the pink sheet but listing the C as the aggressor on the pink sheet.

Aggression should always be coded whenever it occurs (i.e., both low intensity events, such as brief instances that occur as part of an ongoing social interaction, and high intensity events, such as obvious instances of attack) unless the child clearly indicated that the behavior was accidental.

Aggression should not be coded if the behavior simply involves throwing a temper tantrum. Additionally, merely raising one’s voice or asserting oneself (e.g., stop yelling at me!) is not aggression; what is important is the content of the child’s communication--i.e., whether there is an intent to harm another individual.

Finally, only record aggression that you have actually witnessed (i.e., if a child or teacher speaks of an aggressive act but you did not witness it, do not record it).

Sometimes aggression will occur outside the scope of your scan (i.e., involving other children or between scans) and thus would not be captured on a regular coding sheet. As much as possible, such acts--when they involve one or more children participating in the research project--should be captured on a pink sheet.

The Pink Sheet

A “pink sheet” is a separate scan sheet on which coders record aggressive events that are beyond the scope of a regular scan, noting identifying information and aggression details but not peer play characteristics or affect. Pink sheets are required to record instances of aggression in which they are multiple aggressors (e.g., two children teasing another child) or to record any aggression they observe that is not part of a regular scan.

When multiple participating (i.e., in the research project) children aggress against another child, complete a pink sheet for each child who acted aggressively (except if the target child was involved and his/her activity was captured as part of a regular scan). You do not need to complete a pink sheet for the victim.

When an aggressive act involving at least one participating child occurs between scans or during your scan but does not involve the target child, record the aggression on a pink sheet. If the aggressive act involves a participating and a non-participating child, complete the pink sheet using the participating child as your target child (i.e., use his/her ID in the top right corner of the scan sheet). If s/he was the aggressor, complete the sheet as you normally would. If s/he was the victim, then list the aggressor’s identity as N/P; again, if you do not know the other child’s identity and whether or not s/he is participating, write “do not know”). If both (or all) children involved are participating in the research project, use the aggressive child as the target child. If both children aggressed against each other, you may use either child as the target child. There is no need to record aggression that only involves non-participating children.

Pink sheets should be numbered consecutively as part of the overall numbering schema--that is, if the previous regular scan was scan number 34, the subsequent pink sheet should be numbered 35 and the following scan, whether a regular scan or a pink sheet, would be number 36.

****Important****

Completing pink sheets are secondary to the 10-second observation scans. Never disrupt a scan in progress to focus on an aggressive act by other children; instead, finish the scan, fill in the bubble sheet, then turn your attention to the aggressive act. As soon as you have adequately recorded the aggressive act on a pink sheet, begin coding the next child listed on the observation roster (i.e., picking up where you left off with the previous child you coded).

LOGISTICS

Maximizing coding time

To maximize the number of observations you complete during your coding time: After each 10-sec observation, only partly mark the appropriate bubbles, and then use teacher-directed activities such as calendar time, which are not coded, to finish filling in each bubble.

Using the observation roster

Follow the observation rosters (i.e., list of children to be coded) as closely as possible; these lists are created to randomize the order on a weekly basis and may include the same child multiple times to address disproportionate observation numbers. If you need to skip a child on the roster because s/he is unavailable, please go back and code them as soon as they become available (i.e., don't wait until you get to the end of the list). Use the observation roster to note absences, late arrivals and early departures, and to detail any special events that impede your ability to code (e.g., fire fighters visited, fire drills, events with parents, etc.).

Coding Etiquette

Be careful to suppress all reactions (both positive and negative) to what goes on in the playground. While it may be difficult sometimes to remain impassive, it is imperative that you do so. If the children see observers reacting to their activities/behavior, or perceive observers as partaking in their regulation, your presence will affect their behavior more than if you merely observe. I know it is difficult to just watch things take their natural course and not to get involved with the people at the preschool, but it is the observers' responsibility to remain an arm's length from the participants and the people who interact with them.

Positioning

When you are coding, position yourself in the best possible position to view the C's face and activities and hear the C. If the C moves, follow while watching if necessary and/or possible. It is important, however, to be unobtrusive -- When you are observing/coding, the aim is to be impassive and uninvolved... as invisible as possible. Accordingly, do not get too close or watch too intently--if the C recognizes that s/he is being watched, his/her behavior may be affected. Be careful not to impede children's play--ensure they have free access to their play area.

When there are multiple coders

If you are coding in a location with other coders, be aware of your positioning so that you do not affect their ability to code as well. Try not to be too close to each other (except, of course, when training and doing reliability); sitting or standing together makes you more conspicuous than if you are in different parts of the room/playground. If you need to talk to another coder and it is not possible to wait until the end of the coding session, wait until s/he has finished a scan and then, as discretely as possible, ask him/her to meet you outside of the preschool or playground.

If a child responds to your presence

If the C notices you watching him/her: Try looking away for a moment while still paying attention to the C out of the corner of your eye; hopefully this will be sufficient to disengage the child's interest.

If the C is watching you watching him/her: Do not code the C if s/he is watching you. Instead, try moving away to disengage the C's interest, code the next C on the list, and come back to the prior C once s/he has returned to his/her normal activities.

If a child approaches you: Tell the child "I'm sorry, I can't play; when I'm wearing this nametag, I have to do my homework". If the child offers to help with your homework, reply "you are helping me when you play." If the child continues to approach/follow you, leave the room temporarily to disengage interest. If it is necessary to say anything further, simply say "Oh, I have to go now to do my homework."

*Always maintain a neutral but kind tone to your voice and face, and speak quietly and calmly so as not to engage the interest of other children.

If the C orders you to leave: Do not directly respond to the C. Instead, appear to focus on something else for a moment and then re-position yourself to get a better look at it. In this way, you are respecting the C's need for that space without encouraging future approaches. Of course, it is better if coders can avoid such situations proactively through positioning.

Let the preschool teachers do their jobs

It is incumbent upon the observers not to engage in the classroom process or react to the activity in the classroom. Even if the child is engaging in some behavior that troubles you, do not respond; the teachers are in control of their environment and will respond in accordance with the preschool's guidelines.

If you notice that a child is hurt and there are no teachers in the area, calmly and quietly inform the teacher of the child's location. Do not touch the child; we are not authorized to directly interact with the children, only to observe.

The only instance in which we have been authorized to act directly is if there is imminent harm and quick action will save a child from serious harm. An example provided by one of the preschool directors is if an aquarium was about to fall on the child.

APPENDIX K
PEER CONTEXT MEMBERS

Please identify which peers this child is most often around – in order of frequency – regardless of whether their interactions are positive or negative, or if one child frequently follows another ... in effect, who is most frequently/regularly in this child's space?

Please try to name at least 3, although if a greater number of children meet these criteria, you may list up to 5.

Child's Frequent Peer Contacts:

1.		<i>(Most frequently around)</i>
2.		<i>(2nd most)</i>
3.		
4.		
5.		

APPENDIX L
POPULARITY SCALE




In response to each question, please indicate your opinion regarding this student's behavior and tendencies. Using the scale on the right, please indicate the degree to which the statement is "really true," "sort of true," "sort of false," or "really false" by filling in the bubble that corresponds to your answer.

	Really False	Sort of False	Sort of True	Really True
1. This child finds it hard to make friends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. This child has a lot of friends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. This child is popular with others his/her own age.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(irrelevant items dropped)

APPENDIX M
SOCIOMETRIC TASKS

Experimenter: _____

Child Name	C			
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0

Helpful

- 1. _____
- 2. _____
- 3. _____

Argues/Gets Mad

- 1. _____
- 2. _____
- 3. _____

Works well with others

- 1. _____
- 2. _____
- 3. _____

Compliance

0	0
1	0
2	0
3	0

Supplies and preparation.

Be sure you have all supplies (pen, pictures, smiley sheet, and coding sheet). Note that the pictures and the coding sheets are class-specific. Be sure that the picture of the child who will be answering questions is NOT in the pile. Shuffle the pictures before every question so that they are shown in a random order.

Introduce task.

Now I am going to show you some pictures of kids that you know from your classroom. What I want to know is how much you like to play with each kid that I show you. There are no right or wrong answers to the questions. You just tell me what you think. Also, no other kid will know what you say. Everything is just between you and me, OK?

Explain boxes and practice.

You can tell me how much you like to play with each kid by pointing to one of the pictures here on the boxes. The first box means that you like to play with the kid ‘a lot.’ This one means that you like to play with the kid ‘sometimes’ and this one here means that you like to play with the kid ‘just a little bit.’

Let’s practice one. Remember this one means ‘a lot’ this one means ‘sometimes’ and this one means ‘just a little bit.’

How much do you like to eat ice cream? A lot, sometimes, or a little bit? <child responds> Ah, so you like eating ice cream _____[a

lot/sometimes]. Me, I only like eating ice cream a little bit *(or say a lot if they said only a little)*. **So we can think differently -- you can like to eating ice cream [a lot/sometimes] and I can like it a little bit, and that's okay. What's something you like to eat only a little bit?** *<child responds>* **Show me how much you like <child response>.**

If the child doesn't respond as expected, ask: Show how much you like to eat onions or another food that the child probably won't like.

If the child doesn't respond as expected, repeat the question with a different word (e.g., cookies, spinach).

Good, you really understand this game!"

Name children and ask questions.

Now let's start with the pictures. Do you know who this kid is? *(Show the child the picture and hand it to him/her. Wait for child to name the person in the picture. Child's name will be on the back of the photo)*

Right! *If child doesn't know the child, skip the picture and come back to it.* **** Now show me how much you like to play with <name>.** *If the child has trouble, review the answer choices again.* **Do you like to play with <name> a lot, sometimes, or just a little bit?**

**** If the child still cannot name the target child the second time, write "DK" next to the target child's name on the code sheet. Then continue to hold the picture up and say, "This is <name>. How much do you like to play <name>? Record child's response. It is important that you first indicate that the child did not spontaneously say the target child's name**

with a “DK” before recording the child’s peer rating response, so that we can tell which children the child could name on their own.

**Immediately write down what the child says on the sheet.*

Follow this procedure for each child in the classroom for whom we have a picture. Be sure to ask the child if he or she can name the child before asking how much they like to play with child.

Peer Nominations.

Set boxes away from child and place all of the pictures in a random order in front of the child. “Now we are going to play a new game. These pictures are all of the ones I just showed you, but this time I am going to ask you a question and you can pick a child who is like the question that I ask you. Let’s practice one. Can you name a child who has blond hair? What about another child? Is there another one?” (After the child picks a pictures, remove it from the spread). “Good!”

OK. Let’s get started.

Helpful. *Put the pictures that you removed back into spread and shuffle.*

Show me the kid who helps out other kids without being asked, who does this the most. Show me the kid who helps other kids without being asked the next most. And one more kid who does it the next most. *After child names a kid, remove that picture from the spread. Write down the names of the three children on the sheet. Put them in the order names. This is really important. If the child can not name three, just write down the ones that*

he/she does name. Prompt the child only once if he or she can't name another child.

Argues. *Put the pictures that you removed back into the spread and shuffle.*

Show me the kid who argues or gets mad the most. *Same procedure as before, i.e., ...the next most... and the next most.*

Cooperative. *Put pictures that you removed back into the spread and shuffle.*

Show me the kid who works well with others the most. *Same procedure as before.*

Debriefing.

That was fun! You did a great job answering all those questions.

Remember, we said that we won't tell anyone what you said today--not your friends, not your teachers, not your parents--That's our promise to you. If you want to talk to your parents about it, that's okay; just make sure none of the other kids in your class are around. We don't want any of the kids to know what we did and who you picked for the pictures.

That way, everyone is just as surprised as you were and can have as much fun as you did. Okay? Look child in eyes and wait for agreement from child.

APPENDIX N

INSTRUCTIONS FOR THE RECEPTIVE LANGUAGE TASK

WPPSI / Emotion Understanding Checklist and Script

Materials:

- Your nametag
- Pen/Pencil
- List of children with consent
- Child **Assent** Forms
- WPPSI Book
- WPPSI Answer sheet
- EU Photo Book
- EU Answer Sheet
- Data Management Sheet

Before you go into the classroom, sign in on the observer sign in sheet. Before starting the games, make sure you notify the teacher, telling her who you are going to play the games with. Also, don't forget to get child assent before starting the games. When you are finished, sign out on the observer sign in sheet.

WPPSI Introduction and Experimenter Responses:

*Find a quiet place where you and the child can sit facing each other, and where the child won't become easily distracted by others. Once the child is sitting, place the WPPSI book on the table and say, "**Now I'm going to show you some pictures, ask you some questions, and we're going to play some games.**" Start on page 6 and proceed through the WPPSI.*

Remember:

- Only in the BEGINNING the child must get pictures on TWO CONSECUTIVE pages right before moving on
- You may prompt the child once after asking the question if the child says "I don't know" or remains silent for 4 seconds
- If the child asks for your help or asks what a word means you can use the following responses:
 - "Just try your best."**
 - "I want to see how you do by yourself."**
- If you do not see what the child picked or child quickly moves to another picture you can say, "**I didn't see what you picked. Show me XXXX.**"