

## ABSTRACT

Title of Document: The Distribution of Gender Differences in the Temperament and Social Competence of Preschoolers

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The literature has shown gender differences on many temperament and social competence (SC) measures, though there are gaps in understanding where differences lie and whether it varies by informant. This study investigated how temperament relates to SC and whether gender is a moderator. Rater source and the use of standardized versus raw scores and how they influence gender as a moderator was a main focus. Temperament was measured by the *CBQ* (Putnam & Rothbart, 2006) and the newly-developed *CBQ, Teacher Form* (CBQ-T; Teglasi, Schussler, & Gifford, under review). SC was measured by the *SCBE* (LaFreniere & Dumas, 1992), and all measures were administered to the parents and teachers of preschoolers ( $N = 113$ ;  $M$  age = 57 months). For temperament, findings supported the fact that rater agreement is low and holds true for both genders. On the temperament scales on which parents significantly differed from teachers, parents tended to rate boys more favorably than teachers. The hypothesis that teacher ratings would yield more gender differences than parents was supported. There were also more differences in variability between genders for teacher ratings, revealing that teachers tended to provide more extreme ratings. Scales with distributional differences were ones that

have consistently yielded gender differences. For SC, girls had significantly higher means on several scales with raw scores, and raw scores produced more temperament x gender interactions for parent ratings. Activity Level and Anger had opposite effects for gender with higher activity predicting higher SC for girls and lower SC for boys, and higher anger predicting higher SC for boys and lower SC for girls. On Sadness, there were opposite rater effects with Sadness positively associated with SC for parents and negatively associated for teachers. There were fewer gender differences for teachers when considering correlations of temperament and SC. Overall, findings support the importance of obtaining information from parents and teachers about children's temperament and SC. Moreover, these results suggest that raw SC scores are more useful than standard scores for studying relations between SC and temperament, particularly with parent raters. Shortcomings included a limited sample precluding full examination of distributional differences.

THE DISTRIBUTION OF GENDER DIFFERENCES IN THE TEMPERAMENT  
AND SOCIAL COMPETENCE OF PRESCHOOLERS

By

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## **Dedication**

I dedicate this work to many who were instrumental in making it a reality. The idea of “grit” has become a more recent research interest of mine since working in impoverished Title I schools, and this concept has become even more prominent in my mind while completing this dissertation. Grit is commonly known as passion and perseverance toward a long-term goal, and completing my doctorate in school psychology has long been a goal that, at times, seemed too distant, difficult, and unattainable for me to achieve. I believe grit is somewhat inherent and organic (and perhaps, relevantly, an interplay of temperamental traits?), but I also know that one can be “grittier” when given the right tools, opportunities, and support in the times when it is needed most or when grit has worn thin.

I was the first person from my family to graduate college, let alone graduate school, and yet my family, who had minimal education and resources, is the most deserving of thanks for instilling in me a desire to set such a monumental long-term goal. My mom taught me empathy, how to truly walk in someone else’s shoes, and how to be a “helper” in this, sometimes crazy, helping profession. My dad taught me incessant curiosity, the love of learning, and generosity—even when there is little to give materialistically. All of this, mixed with first-hand exposure to the mental illnesses and disabilities of family and friends, caused me to want to help others and make a difference in others’ lives, but in the most effective, efficient, and results-focused way possible. For me, getting my doctorate in school psychology was the way to do that, and I am grateful to my family for making me the person to achieve such a goal.

Sometimes those “soft skills” are not enough, and words cannot express my gratitude to The Cohort for being endlessly supportive. From monthly potlucks, to Panera paper-writing marathons, to studying for the Praxis and writing Comps during our weekends, this could not

have happened without you. Thank you for always listening and empathizing, and it always helped to know that others had to overcome through the same hurdles. You were, and still are, my inspiration to be the best school psychologist I can be.

Last, but not least, I would not have finished my dissertation without the endless love and support of my fiancé, Mike. You were the epitome of grit, dedication, and hard work over the past year as you completed your CPA and gave me inspiration to work just as hard. When your CPA was finished, and I was *still* writing, you had endless patience and encouragement pushing me to the finish line—even when it wasn't pretty or easy. I look forward to enjoying our weeknights and weekends together again, and I could not feel more fortunate to get to marry you in two weeks.

Finishing graduate school and my dissertation has made me grittier than I ever thought I could be, and there were many times over the past few years that I thought I had done all I could, and probably should stop “faking it until I make it.” In the end, I proved to myself that I could make it on hard work and dedication, but not without being lifted up by those around me who believed in me when I didn't even believe in myself. My new goal is to be that person for those who need it the most.

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## **Chapter 1: Introduction**

### **Temperament and Gender**

Temperament is defined as the biologically-based dimensions of individuality that influence outcomes throughout development by shaping how one engages with his or her environment (Rothbart & Bates, 1998; Rothbart, Ahadi, & Evans, 2000). Other researchers have described temperament predispositions as heritable, appearing early in life, and remaining relatively stable over time, yet their expression is still influenced by maturation, experience, and environment (Rothbart, 1989; Rothbart & Derryberry, 1981; for a review, see Teglasi, 2006). The factors that have emerged from children's temperament research have shown strong conceptual similarity with the Big Five of adult personality (Shiner, 2010).

Various theoretical perspectives related to temperament have evolved over time and are currently debated (see review, Teglasi, 1998). Thomas, Chess, and Birch (1968) found nine dimensions of temperament in their famous New York Longitudinal Study (NYLS) of infants, during which they interviewed parents about their infants' behavior in different contexts and inductively sorted the reported behaviors into the nine dimensions of Activity Level, Approach/Withdrawal, Adaptability, Mood, Threshold, Intensity, Distractibility, Rhythmicity, and Attention Span/Persistence. These dimensions are based on infants 2 to 6 months of age, and thus do not incorporate temperamental aspects that develop later than early infancy (Rothbart, et al., 2000). Additionally, the NYLS dimensions came about for clinical purposes without an initial conceptual framework in place (Rothbart, et al., 2000; see review by Martin, Wisenbaker, & Huttunen, 1994).

Through a different approach, Buss and Plomin (1975, 1984) developed their Emotionality-Activity-Sociability (EAS) framework by creating a list of temperament

dimensions based on early appearance and heritability. Rowe and Plomin (1977) combined a selected set of items from the NYLS and EAS measures and administered them to a sample of children ages 1 to 6 years. Through an item-level factor analysis, the dimensions of Emotionality, Soothability, Activity Level, Attention Span, and Sociability were found.

In a third approach, Rothbart, Ahadi, Hershey, and Fisher (2001) have consistently found three broad dimensions of temperament including Surgency/Extraversion, Negative Affectivity, and Effortful Control through their work with the Children's Behavior Questionnaire (CBQ) given to caregivers, which is later discussed in greater detail.

Gender differences have been reported on several variables of temperament, but much of the literature has found that preschool boys tend to be more active, distractible, (Walker, Berthelsen, & Irving, 2001) and less persistent (Walker et al., 2001) than girls. The research has also consistently shown that preschool girls tend to demonstrate more effortful control (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006), task orientation, adaptability, flexibility, and less reactivity (Keogh, 1998, 2003; Griggs, Gagnon, Huelsman, Kiddler-Ashley, & Ballard, 2009) compared to boys.

### **Social Competence and Gender**

In general, social competencies are regulatory tools that allow one to meet situational demands and social expectations (Rothbart & Bates, 1998). In order to behave in a socially competent manner in certain contexts, knowledge of situational demands, social expectations for those situations, and recognition of other's emotions are necessary. Howes (1988) also defined social competence (SC) early on as behavior that incorporates the ability to socially function with peers and achieve personal goals while remaining sensitive to peers' needs and desires.

Much of the literature has shown gender differences in social development and behavior. Girls tend to display more socially competent behaviors than boys (Birch & Ladd, 2000), and therefore, studies of temperament, socially competent behavior, and their correlates must consider the factor of gender (Griggs et al., 2009). Because segregation in play between boys and girls begins at a young age and lasts into adolescence, boys and girls may possess a different set of social experiences and grow to hold differing norms. Rose-Krasnor (1997) also noted that, because boys tend to play in larger groups than girls and girls tend to play in small groups or dyads, boys may set their social goals toward group acceptance, whereas girls may focus their efforts on building friendships. A different skill set may develop for boys and girls to be successful in their differing social interactions.

Measures of SC frequently use gender normed scores, implying that identical raw scores on a measure have different meanings based on one's gender. However, it may be that true gender differences are obscured by normed scores and that understanding relations between SC and other correlates may differ depending on whether raw or standardized scores are used.

### **Introduction to the Current Study**

The following chapter will outline the literature on gender differences in the constructs of temperament and SC. Overall, the present study sought to: a) investigate distributional differences between genders regardless of mean differences, b) consider distributional differences in temperament considered separately by gender for each rater (parents and teachers), c) examine how the use of raw scores versus standardized gender-normed scores influence distributional properties and where gender differences are located in the distribution (e.g., in the middle or at the extremes), and d) investigate the relations between SC using both raw and standardized scores and parent- and teacher-rated temperament for each gender.



The related literature, conceptual underpinnings, and the rationale for the current work will be explained in Chapter 2; methods, analyses, and results will be outlined in Chapters 3 and 4; and a discussion of the findings, limitations, and implications for future research will be included in Chapter 5.

## Chapter 2: Review of the Literature

### Rothbart and Colleagues' Psychobiological Approach to Temperament

Rothbart and Derryberry (1981) define temperament as the emotional, motor, and attentional reactivity measured by latency, intensity, and recovery of response, and self-regulation processes such as effortful control that modulate reactivity. This approach differs from others in that temperament is considered not only a solitary individual characteristic that surfaces through all behaviors, but rather the context-specific expression of a trait. Temperament is influenced by maturation, experience, and environment (for review, see Teglasi, 2006). For instance, fear does not emerge until about 6 to 7 months of age, executive attention and self-regulation are not seen until about 10 to 12 months of age, and the executive system undergoes rapid development in the preschool years (Posner, Rothbart, & Sheese, 2007; Rothbart et al., 2001). Rothbart (2001) anticipated that temperamental characteristics seen in infancy, as well as adulthood, would be present at the preschool age. Therefore, the *Children's Behavior Questionnaire* (CBQ; Rothbart et al., 2001) was designed to measure temperamental constructs upward in age from the *Infant Behavior Questionnaire* (IBQ; Rothbart, 1981) and downward in age from the *Physiological Reactions Questionnaire* (PRQ) developed to measure adult temperament (Rothbart et al., 2000).

Overall, the CBQ was designed by Rothbart and colleagues (2001) to assess constitutionally-based temperament, individual differences in reactivity, and self-regulation. This differs from previous temperament approaches due to the addition of reactivity, arousability, and self-regulation as central constructs. Rothbart and colleagues (2001) described constitutionally-based temperament as “the individual’s relatively enduring biological make-up, influenced over time by heredity, maturation, and experience” (p. 1395; Rothbart, 1989; Rothbart

& Derryberry, 1981). Reactivity refers to the arousability of motor, affective, and sensory response systems (Rothbart & Derryberry, 1981), and self-regulation is defined as the processes that modulate reactivity, such as attentional focusing and inhibitory control (Rothbart, et al., 2001). This framework put forth by Rothbart provided a view of temperamental variability that assesses the individual differences in positive emotional reactivity (smiling/laughter, pleasure), negative emotional reactivity (fear, distress, sadness), self-regulation (including attention), activity, behavioral inhibition (fear or shyness), and inhibitory control. Rothbart and colleagues (2001) further defined this framework based on their work with the CBQ into three broad dimensions: effortful control, negative affectivity, and extraversion/surgency.

**Effortful control.** The construct of effortful control (EC) surfaced from psychometric studies of caregiver reports as well as laboratory studies (Rothbart & Bates, 2006). EC describes children's ability to plan, choose an action when conflicted, and notice errors (Rothbart, 2007). EC has been linked to several developmental outcomes, including behavior problems. The CBQ defines EC based on four scales (Rothbart & Bates, 2006). The first scale, attentional focusing, is the capacity to focus and shift attention when desired and it is the same dimension as the Attention Span/Persistence scale on the NYLS and Duration of Orienting on the IBQ (Rothbart, et al., 2001). Second, inhibitory control is the capacity to plan future action and suppress inappropriate reactions. Inhibitory control develops after early infancy and is not assessed on the NYLS or IBQ (Rothbart, et al, 2001). However, it is included on the PRQ (Derryberry & Rothbart, 1988) and is appropriate to assess for the CBQ age range (ages 3-7 years; Rothbart, et al., 2001). Third, perceptual sensitivity refers to the detection or perceptual awareness of slight, low-intensity stimulation. It is measured on the NYLS as Threshold and the PRQ as External Sensitivity (Rothbart, et al., 2001). It is also related to the attentional systems of orienting

(Posner et al., 2007; Rothbart, et al., 2001). Fourth, low intensity pleasure is the pleasure drawn from activities or stimuli that have low intensity, rate, complexity, novelty, and incongruity.

The CBQ was designed to assess temperament based on differences in reactivity and self-regulation, and Rothbart et al. (2001) view the dimension of effortful control as a self-regulatory aspect of temperament, as self-regulation encompasses one's attentional focusing and inhibitory control.

**Negative affectivity.** Negative emotionality, including anger, fear, and irritability/frustration, has been found to predict both internalizing and externalizing problems (Rothbart & Sheese, 2007). However, fear is more strongly related to internalizing problems whereas anger tends to be related to externalizing problems (Rothbart, 2007). The CBQ includes five scales in the negative affectivity dimension (Rothbart, 2007). First, anger/frustration is the negative affect related to interruption of ongoing tasks or goal blocking. Anger/frustration has been labeled as a primary emotion (Izard, 1977) and is related to approach-anticipation as the strength of expectation of reward and to aggressive self-regulation (Rothbart & Bates, 2006; Rothbart, et al., 2001). Second, fear is related to the anticipation of distress. It is included as part of the Emotionality dimension of the EAS and is measured on the IBQ as a Fear dimension. Fear also corresponds to the Withdrawal pole of the NYLS Approach-Withdrawal dimension and has been identified as a primary emotion (Izard, 1977; Rothbart, et al., 2001). Third, discomfort is related to the sensory qualities of stimulation, including intensity, rate, or complexity of light, movement, sound, or texture. Discomfort corresponds to the primary emotion of distress (Izard, 1977). Fourth, sadness is the lowered mood and energy related to exposure to suffering, disappointment, and object loss. It is not assessed in the IBQ or other infant and child measures, though it is measured in the PRQ and is considered a primary emotion (Izard, 1977; Rothbart, et

al., 2001). Fifth, falling reactivity/soothability is the rate of recovery from peak distress, excitement, or general arousal. This dimension is also assessed in the IBQ as Soothability, though it is not usually assessed in infant scales (Rothbart, et al., 2001). In terms of reactivity and self-regulation, Rothbart et al. (2001) view the dimension of negative reactivity as emerging from the motor, affective, and sensory response systems. In addition, they view it in relation to self-regulation because it serves as a process that modulates negative reactivity and regulates one's arousal through soothability.

**Extraversion/surgency.** Extraversion/surgency is a dimension that is characterized by high levels of activity, positive emotion, impulsivity, and reactivity to one's surrounding environment, and it has been shown to be related to greater externalizing problems and fewer internalizing problems (Rothbart, 2007). The CBQ defines extraversion/surgency based on six scales (Rothbart, 2007). First, activity level encompasses gross motor activity including the rate and extent of locomotion. It is widely measured by temperament researchers, including questionnaires based on the NYLS (i.e., McDevitt & Carey, 1978), the EAS, and the IBQ. Second, shyness is behavioral inhibition related to novelty and challenge, especially those that are social. It negatively loads onto one dimension of Kagan and colleagues' behavioral inhibition construct (Kagan, Reznick, & Snidman, 1988; Rothbart & Mauro, 1990; Rothbart, et al., 2001). Third, high-intensity pleasure refers to enjoyment from activities involving high intensity or novelty. It is measured on the PRQ (Derryberry & Rothbart, 1988) and appears to be similar to Zuckerman's (1990) sensation-seeking construct (Rothbart, et al., 2001). Fourth, smiling and laughter is the positive affect that results in response to changes in stimulus intensity, rate, and complexity. It is not assessed in the EAS, but seems to relate to the positive pole of the NYLS Mood dimension. Smiling and laughter is assessed on the IBQ (Rothbart,

1981), and Rothbart et al. (2001) anticipated that it would be related to the primary emotion of joy in that children who expressively display enjoyment would be rated higher on the smiling and laughter scale (Izard, 1977). Fifth, impulsivity is the speed of response initiation and is one of the most heritable traits. Impulsivity was originally included in Buss and Plomin's (1984) EASI (Emotionality-Activity-Sociability-Impulsivity), which was the precursor to the EAS, and was later subsumed under the Activity dimension. Rothbart et al. (2001) include it as part of the CBQ because they have found it to be an important part of the construct of approach in their other laboratory work and it is included in other theoretical models (see review by Rothbart, Derryberry, & Posner, 1994). Sixth, positive anticipation is the positive excitement for expected pleasurable activities. It is assessed in the NYLS through the Approach pole on the Approach/Withdrawal dimension in relation to novel situations (Rothbart, et al., 2001). It is not assessed on the EAS or IBQ, but is assessed on the adult PRQ on the scale of Positive Affect (Rothbart, et al., 2001). Positive anticipation also corresponds to Gray's (1982, 1987), Panskepp's (1982, 1998), and Depue and colleagues' (Depue & Collins, 1999; Depue & Iacono, 1989) dimensions in their biological models of temperament (see review by Rothbart, et al., 1994; Rothbart, et al., 2001).

Rothbart et al. (2001) view the dimension of extraversion/surgency in relation to both reactivity and self-regulation. Extraversion/surgency emerges from one's motor, affective, and sensory response systems. Additionally, self-regulation serves to modulate one's arousal, including extraversion/surgency.

**Rater agreement on temperament measures.** Interrater agreement on child temperament measures has consistently been shown to be low to moderate (Billman & McDevitt, 1980; Diener, Goldstein, & Mangelsdorf, 1995; Field & Greenberg, 1982; Huitt & Ashton, 1982;

Matheny, Wilson, & Thoben, 1987; Northam, Prior, Sanson, & Oberklaid, 1987; Seifer, Sameroff, Barrett, & Krafchuk, 1994; Thomas, Chess, & Korn, 1982). A meta-analysis of 119 studies found that the ratings of social, emotional, and behavioral problems were discrepant among different informants' (parents, teachers, and children's self-reports; Achenbach, McConaughy, & Howell, 1987), and this has consistently been found in studies that look at informant discrepancies (De Los Reyes & Kazdin, 2005).

*Parent-teacher informant pairs.* Comparisons of temperament ratings derived from different sources are often used to determine the level of consensus across raters or as an indicator of either the reliability or validity of the rating scale (Rothbart & Bates, 1998; Strelau, 1998). The literature has commonly found low to moderate correlations between parent and teacher ratings of temperament (Billman & McDevitt, 1980; Field & Greenberg, 1982; Goldsmith, Rieser-Danner, & Briggs, 1991; Jewsuwan, Luster, & Kostelnik, 1993; Northam et al., 1987).

Jewsuwan et al. (1993) administered the Colorado Childhood Temperament Inventory (CCTI; Rowe & Plomin, 1977) to parents and teachers and were asked to rate their preschoolers ( $N=35$ ). They found that mothers and fathers significantly agreed on four of the five temperament dimensions (Sociability, Emotionality, Activity, and Attention Span/Persistence; mean  $r=.47$ , range .09 to .63). Fathers and teachers showed significant agreement on the dimensions of Sociability, Emotionality, and Activity (mean  $r=.37$ , range .00 to .64), whereas mothers and teachers showed significant agreement on Sociability and Emotionality (mean  $r=.41$ , range .15 to .70). This study found mother-father agreement to be higher than parent-teacher agreement, though there were still moderate levels of agreement between parents and teachers.

Field and Greenberg (1982) asked parents and daycare/preschool teachers (both head and assistant teachers) to rate infants (4-12 months of age;  $N=16$ ) and toddlers/preschoolers (18-32 months of age;  $N=33$ ) on their temperament. The Revised Infant Temperament Questionnaire (RITQ; Carey & McDevitt, 1978) was used for the infants and the Toddler Temperament Scale (TTS; Fullard, McDevitt, & Carey, 1984) was used for the toddlers/preschoolers. The authors found significantly higher agreement between parents for both the infant and toddler/preschooler groups ( $r=.36$  and  $.46$ , respectively) compared to father-teacher ( $r=.30$  and  $.39$ ), mother-teacher ( $r=.20$  and  $.35$ ), or inter-teacher ( $r=.29$  and  $.37$ ) ratings.

Goldsmith et al. (1991) compared mother and teacher ratings of infants ( $N=33$ ), toddlers ( $N=36$ ), and preschoolers ( $N=45$ ). The infant group was rated using the RITQ (Carey & McDevitt, 1978), ICQ (Bates, Freeland, & Lounsbury, 1979), and IBQ (Rothbart, 1981), and the agreement found between mothers and teachers was moderately low (mean  $r=.36$ , range  $.17$  to  $.50$ ). The toddler group was rated using the TTS, EAS, and Toddler Behavior Assessment Questionnaire (TBAQ; Goldsmith, 1996), and the agreement found was lower than that found for infants (mean  $r=.15$ , range  $-.05$  to  $.35$ ). Agreement was also low for the preschooler group (mean  $r=.28$ , range  $.00$  to  $.60$ ) who was rated using the Behavioral Styles Questionnaire (BSQ; McDevitt & Carey, 1978), EAS, and Dimensions of Temperament Scale (DOTS; Lerner, Palermo, Spiro, & Nesselroade, 1982). The authors found that the mother and teacher agreement on the Fear scale on the IBQ was the only correlation significant enough to suggest consistency across raters and contexts. Overall, they found the level of agreement between parent and teacher raters to be insignificant.

***Discrepancies between rater pairs.*** De Los Reyes and Kazdin (2005) assert that there is a need to incorporate data from multiple informants because, though a child may be observed in



similar contexts or environments, informants have differing motivations for the ratings they provide and perceptions of what comprises normal behavior in children. Discrepancies have often been attributed to differences in the context in which the child is seen by the informants and differences in the perspectives of the informants. Some informants may also be affected by emotion and negative affect when reporting on a child and parents are especially prone to this (De Los Reyes & Kazdin, 2005).

There are several possibilities as to why temperament ratings tend to differ across sources. First, certain aspects of temperament may vary in different contexts and raters might simply report what they observe in the context in which they see the child. Though different environments elicit different behaviors, some stability in temperament should be apparent across contexts in varying situations (Goldsmith, Reiser-Danner, & Briggs, 1991; Northam et al., 1987; Strelau, 1998).

A second reason is that the individual differences across raters may bias the way in which they view the child. Characteristics such as socioeconomic status, cultural background, gender, and psychological attributes likely impact the way in which the individual views the child, and subsequently, the way that they rate the child's temperament (Matheny et al., 1987; Northam et al., 1987; Wolk, Zeanah, Garcia Coll, & Carr, 1992). Also, each informant may recall information about the child from memory that is consistent with their different perspectives.

A third reason might be the stability of temperament, particularly a "difficult temperament." Difficult temperament dimensions tend to have a higher level of agreement across raters. Huitt and Ashton (1982) found that four of the five temperament dimensions (Activity, Rhythmicity, Threshold, Intensity, and Mood) that were agreed upon by two different parents were related to measures of temperament difficulty. Also, Billman and McDevitt (1980)

found that mothers and observers agreed upon temperamental dimensions that were related to temperament difficulty.

### **Gender Differences in Temperament**

Much of the research on children's temperament has yielded gender differences. Several reviews of the literature (Else-Quest et al., 2006; Maccoby & Jacklin, 1974; Rothbart, 1986) indicate a lack of gender differences in temperament in infancy, and boys and girls are similarly rated in emotional upsets and frustrational reactions up to approximately 18 months of age (Maccoby & Jacklin, 1974). Differences tend to emerge around the age of 18 months when boys are reported to show more negative emotional outbursts (Maccoby & Jacklin, 1974) and higher activity level (Eaton & Enns, 1986). Else-Quest et al. (2006) suggest that the expression of temperament is influenced by social and environmental factors and that socialization and maturation impact the differential development of temperament in girls and boys. It is well-known that girls and boys are socialized differently and that social pressures exist to conform to one's gender roles. Therefore, it might be expected that older children exhibit more pronounced temperamental differences given their exposure to socialization over time.

In their thorough analysis of gender differences in temperament, Else-Quest et al. (2006) found that measures completed by parents are less likely to yield gender differences and offer the explanation that teachers are more likely to witness children interacting in peer groups with the same gender, thus magnifying gender differences. They also note that because parents are the primary socializers of their children, including gender roles, parents' perceptions of their child may be biased by their own gender role stereotypes (Else-Quest, et al., 2006).

#### **Else-Quest and colleagues' meta-analysis and the current review of the literature.**

The most recent comprehensive meta-analysis of gender differences in temperament was

conducted by Else-Quest and colleagues (2006) and its main findings that are relevant to the current study will be reviewed later in this section. Although one objective of the current literature review is to extend Else-Quest and colleagues' (2006) work, the primary purpose is to scrutinize the literature on gender differences in temperament since the review was conducted. More specifically, the following review considers the magnitude of effect sizes by gender (as calculated by the current author using Cohen's  $d$ ), significant differences in standard deviations between boys and girls (as calculated by the current author with the  $F$ -test), and rater source. The studies included were also inspected in order to determine whether or not the distribution or the skewness of the sample were considered by the authors. Possible moderator variables for gender differences, such as rater source and child age were also considered throughout the review.

Else-Quest and her colleagues (2006) reviewed articles published in English from 1960 through 2002 that included the search term "temperament." They used the Psyc-INFO database because it includes the most comprehensive coverage of psychological, psychiatric, and educational journals, unpublished dissertations, and edited books, and restricted the articles by only including those that were empirical or longitudinal studies with human samples identified as neonatal, infancy, childhood, preschool age, or school age. These search criteria yielded a total of 1,641 abstracts and 1,204 were found to meet the following criteria: a) the study was empirical, b) there were 10 or more study participants in the sample, c) the study measured temperament, d) the sample included both boys and girls, and e) the sample participants were between the ages of 3 months and 13 years.

Articles were then excluded if a) sufficient information needed to estimate effect size was not included, b) the study could not be obtained through interlibrary loan, c) the articles used

measures or dimensions inconsistent with the three main methodological approaches (the Behavioral Style Approach of Thomas and Chess, Criterial Approach of Buss and Plomin, or Psychobiological Approach of Rothbart), and d) the studies used clinical samples or sampled children based on a particular trait (e.g., included only children characterized as “difficult”). Overall, a total of 189 studies were included in the meta-analysis, including 136 published studies, 48 unpublished dissertations, and 5 unpublished data sets provided by authors.

In order to extend Else-Quest et al.’s (2006) work and include more recent studies, I searched the Psyc-INFO electronic database for articles published from 2002, the year in which Else-Quest et al.’s (2006) review was completed, to 2013 using the search term “temperament” paired with one of the following search terms: “sex,” “gender,” “boys, girls,” and “gender differences.” In line with Else-Quest et al.’s (2006) criteria, the resulting abstracts were reviewed to include only those articles that a) were published in English, b) were empirical or longitudinal in design, c) used human subjects, d) studied temperamental dimensions as defined by one of the three main theoretical approaches outlined in Chapter 1 of the current manuscript, and e) used participants ages 3 months to 13 years of age. Also, due to the scope of this study, studies that used solely child performance measures in a laboratory setting to measure temperamental characteristics were excluded.

These limiting criteria resulted in 41 articles and 19 provided sufficient information to compute effect sizes (see Appendix A). None of the 41 articles reviewed dissected gender differences by analyzing the distribution of girls’ and boys’ scores on dimensions of temperament, their dispersion from the mean, or the locus of the differences, and one primary aim of the current study is to identify and dissect such gender differences. In this search, 25 of the 41 articles did not report means, standard deviations, or correlations by gender, and therefore,

an analysis of the locus of gender differences could not be conducted.

The effect size  $d$  was computed by subtracting the mean score for girls from the mean score for boys and dividing the result by the pooled standard deviation. For studies that only provided Pearson correlations between gender and the temperament dimension,  $r$  was converted to  $d$  using the formula provided by Cohen (1988):  $d = 2r/\sqrt{(1-r^2)}$ . Positive values of  $d$  represent higher scores for boys than girls, whereas negative values represent higher scores for girls. Cohen's (1988) guidelines for the interpretation of effect sizes were used when interpreting the data and were outlined as  $d = 0.20$ ,  $0.50$ , and  $0.80$  and are considered small, medium, and large, respectively. Appendix A lists the studies resulting from the search described above and will be reviewed in the following section and synthesized with the major findings and conclusions from Else-Quest et al.'s (2006) meta-analysis.

**Effortful control.** Several studies have found a notably large and significant gender difference on the factor of effortful control (Else-Quest, et al., 2006). On the dimensions within the factor, attentional focusing and low intensity pleasure were found to have significant, yet small, gender differences (Else-Quest, et al., 2006). Perceptual sensitivity displayed small to moderate differences and inhibitory control was moderate in magnitude (Else-Quest, et al., 2006).

Olson, Sameroff, Kerr, Lopez, and Wellman (2005) investigated the relations between effortful control, temperament, and externalizing problems in 3-year-old boys and girls ( $N=220$ ). On the mother-reported CBQ, girls had significantly higher scores than boys on effortful control ( $d=-.23$ ), and boys ( $SD=1.44$ ) were rated with significantly more variability than girls ( $SD=1.21$ ; ( $F(113, 107) = 1.41$ ;  $p<.05$ ) when calculated by the current author.

Zhou and colleagues (2004) investigated temperament and its relations to parenting styles

and social functioning in first and second graders ( $N=425$ ) in Beijing, China. They found that parents and teachers rated first and second grade girls higher than boys on effortful control ( $d=-.28, -.73$ , respectively) on the CBQ, though the difference between boys and girls was more substantial when rated by teachers. No significant differences were found between boys' and girls' standard deviations on either parent or teacher reports when calculated by this author.

Casalin, Luyten, Vliegen, and Meurs (2012) investigated the factor structure and stability of temperament from infancy (8-13 months) to toddlerhood (20-25 months;  $N=281$ ). When rated by fathers in toddlerhood, girls were rated higher on subscales of effortful control ( $d=-.55$ ). When rated by mothers, infant girls were rated significantly higher with effect sizes that were small in magnitude on orienting/regulating ( $d=-.41$ ). In toddlerhood, mothers rated infant girls significantly higher than boys on effortful control ( $d=-.43$ ). On both mother and father reports, there was little difference in the standard deviations for the two genders on the IBQ-R. On the *Early Childhood Behavior Questionnaire* (ECBQ; Putnam & Rothbart, 2006), there was more variability, though it did not reach significance when calculated by this author, between girls and boys on mother and father ratings of effortful control (mother ratings  $SD=.77, .49$ ;  $F(18, 44)=1.57, p>.05$ ; father ratings  $SD=.71, .49$ ;  $F(13, 42)=1.45; p>.05$ ) with girls rated with more variability than boys.

Rudasill and Rimm-Kaufman (2009) examined how child temperament and gender contribute to teacher-child relationship quality and the frequency of teacher-child interactions. Based on parent report on the CBQ, first grade girls were rated significantly higher than first grade boys on attentional focusing ( $d=-.32$ ), inhibitory control ( $d=-.38$ ), and effortful control ( $d=-.40$ ). However, Rudasill (2011) found that parent ratings for first, second, and third graders on the CBQ indicated only slightly higher scores for girls on both effortful control (attentional

focusing and inhibitory control scores averaged together;  $d=-.04$ ) and they were not significant from boys' scores.

Komsi, Raikkonen, Heinonen, Pesonen, Keskivaara, Jarvenpaa, and Strandberg (2008) studied the stability of temperament from infancy ( $N=115$ ) to preschool ( $N=109$ ) based on father ratings on the IBQ-R and CBQ. On the CBQ, they found that girls were rated significantly higher than boys on perceptual sensitivity ( $d=-.43$ ) with similar standard deviations for both genders.

Komsi, Raikkonen, Pesonen, Heinonen, Keskivaara, Jarvenpaa, and Strandberg (2006) also investigated the continuity of temperament from infancy to preschool-age based on maternal ratings on the IBQ-R and CBQ ( $N=231$ ). On the CBQ, gender differences that were small in magnitude were found with girls being rated higher than boys on attentional focusing ( $d=-.20$ ), inhibitory control ( $d=-.25$ ), low intensity pleasure ( $d=-.28$ ), and effortful control ( $d=-.45$ ). Perceptual sensitivity ( $d=-.55$ ) was also found to be significantly higher for girls and was moderate in magnitude. Boys ( $SD=.60$ ) were rated with significantly more variability than girls ( $SD=.50$ ) on the superfactor of effortful control ( $F(114, 115) = 1.44; p<.05$ ) on the CBQ when calculated by the current author.

Gagne, Miller, and Goldsmith (2013) examined gender differences in temperament for three-year-old twins ( $N=714$ ) as rated by mothers and fathers on the CBQ. They found that girls were rated higher on inhibitory control by both mothers ( $d=-.39$ ) and fathers ( $d=-.23$ ), and the present author found little variability in standard deviations between girls and boys, respectively, by both raters (mothers  $SD=.94, 1.01$ ; fathers  $SD=.97, .95$ ).

DeThorne, Deater-Deckard, Mahurin-Smith, Coletto, and Petrill (2011) obtained ratings from parents on the CBQ-SF ( $N=161$ ). Girls were rated to have significantly higher levels of

perceptual sensitivity ( $d=-.48$ ) than boys. The locus of the gender differences and the distribution of scores from the mean could not be analyzed because the authors did not report means and standard deviations.

Booth-LaForce and Oxford (2008) conducted a longitudinal study that investigated attachment, early parenting styles, and temperament in infants as predictors of social withdrawal in grades one through six ( $N=1,092$ ). Minimal gender differences were found based on mother ratings of temperament using the ITQ and CBQ. Boys were rated to have higher levels of intrusiveness ( $d=.14$ ) as infants on the ITQ and girls were rated to have higher levels of inhibitory control ( $d=-.34$ ) on the CBQ, though the locus of the differences could not be identified because standard deviations and means were not available and effect sizes were computed from  $r$ .

Hanish, Eisenberg, Fabes, Spinrad, Ryan, and Schmidt (2004) examined one's inability to regulate negative emotions as a risk factor for peer victimization in preschoolers ranging in age from 32 to 75 months ( $N=126$ ). Regulation (as measured by the attentional focusing and inhibitory control scales on the CBQ) was rated by teachers and found to be significantly higher for girls than boys ( $d=-.47$ ).

De Boo and Spiering (2010) investigated relationships between temperament, coping, depressive and aggressive mood in pre-adolescents ( $N=404$ ,  $M$  age=10.0 years) based on self-reports on the Dutch adaptation of the EATQ-R (Ellis & Rothbart, 2001; De Boo & Kolk, 2007). There was some variability in the standard deviations of girls ( $SD=6.4$ ) and boys ( $SD=5.8$ ) on the factor of effortful control ( $F(219, 185)=1.22$ ;  $p>.05$ ) when calculated by this author, though it was not significant, and there was not a significant gender difference overall ( $d=-.03$ ).

Spinrad, Eisenberg, Cumberland, Fabes, Valiente, Shepard, Reiser, Losoya, and Guthrie



(2006) examined the relation of effortful regulation to SC in 4- to 7-year-olds at two different time periods ( $N=214$  at Time 1;  $N=193$  at Time 2). Girls were rated to have higher levels of effortful regulation (as measured by the attentional focusing and inhibitory control scales on the CBQ) at Times 1 and 2 by mothers (Time 1  $d=-.48$ ; Time 2  $d=-.29$ ) and teachers (Time 1  $d=-.51$ ; Time 2  $d=-.68$ ) with teachers' ratings being larger in magnitude. When calculated by the current author, mothers rated boys with significantly more variability on effortful control than girls at Time 1 ( $SD=.82, .59$ , respectively;  $F(118, 96)=1.39, p<.05$ ).

Mullola, Ravaja, Lipsanen, Alatupa, Hintsanen, Jokela, and Keltikangas-Jarvinen (2012) found that teachers ( $N=221$ ) perceived Finnish ninth grade boys' ( $N=1,593$ ) temperament and EC more negatively than girls' ( $N=1,619$ ), though the difference was not as large when perceived by male teachers compared to female teachers. Gender differences in activity level ( $d=.51$ ) and distractibility ( $d=.57$ ) were significant and moderate in magnitude with boys scoring higher. In a similar study by the same authors, activity level ( $d=.36, .48$ ) and distractibility ( $d=.39, .60$ ) were found to be significantly higher for boys when rated by mathematics and language teachers, respectively, and inhibition ( $d=.24$ ) was only significantly higher for boys when rated by language teachers (Mullola et al., 2011).

**Conclusion.** Overall, gender differences were found with moderate effect sizes with girls rated higher on effortful control compared to boys (Casalin et al., 2012; Olson et al., 2005; Rudasill & Rimm-Kaufman, 2009; Zhou et al., 2004; see Appendix A) and teacher ratings yielded larger effect sizes compared to parent ratings (Zhou et al., 2004). One study did not find significant differences between girls and boys on effortful control (Rudasill, 2011). Girls were also rated higher (with small effect sizes) than boys on attentional focusing and inhibitory control (Booth-LaForce & Oxford, 2008; Gagne et al., 2013; Hanish et al., 2004; Komsu et al., 2006;

Mullola et al., 2012; Rudasill & Rimm-Kaufmann, 2009), low intensity pleasure (Komsis et al., 2006), and perceptual sensitivity (Komsis et al., 2008). Again, larger effect sizes were found for teacher ratings compared to parent ratings for attentional focusing and inhibitory control (Spinrad et al., 2006). Two studies found moderate effect sizes with girls rated higher on perceptual sensitivity (DeThorne et al., 2011; Komsis et al., 2006). In terms of variability, which was calculated by the current author, mothers rated boys with significantly more variability than girls on effortful control overall (Komsis et al., 2006; Olson et al., 2005; Spinrad et al., 2006). However, no differences in variability were found for the scales of perceptual sensitivity (Komsis et al., 2008) or inhibitory control (Gagne et al., 2013; see Appendix A).

**Negative affectivity.** Else-Quest and colleagues (2006) reported minimal gender differences on the temperament subscales of negative affectivity. They only found a very small gender difference with girls rated higher on the dimension of fear ( $d=-.12$ ) and did not find differences on the dimensions of anger, discomfort, sadness, or soothability/falling reactivity with parent raters.

Similarly, Olson and colleagues (2005) found no significant differences on the CBQ between girls and boys on anger ( $d=.04$ ) and boys and girls were rated with similar variability ( $SD=.76, .72$ ). Rudasill and Rimm-Kaufman (2009) found that girls were rated to have slightly higher levels of shyness ( $d=-.14$ ) than boys on the CBQ when rated by parents, though it was not significant. Rudasill (2011) also found that parent ratings on the CBQ yielded slightly higher scores for girls on shyness ( $d=-.16$ ), though it was not significant in magnitude. Booth-LaForce and Oxford (2008) found that infant and preschool girls were rated to have only slightly higher and nonsignificant levels of positive mood ( $d=-.06$ ) compared to boys based on maternal ratings on the ITQ and CBQ, and variability in scores between boys and girls could not be analyzed

because standard deviations were not reported.

However, several authors have reported significant gender differences on dimensions of negative affectivity. Zhou and colleagues (2004) found that teachers rated first and second grade boys significantly higher in anger/frustration ( $d=.41$ ) on the CBQ, whereas parent ratings did not yield a gender difference. No significant differences were found between boys' and girls' standard deviations on either parent or teacher reports when analyzed by this author.

Hanish and colleagues (2004) found that parents ( $d=.14$ ) and teachers ( $d=.53$ ) rated boys higher than girls on anger, though only teacher ratings showed significant gender effects. When calculated by this author, the variability in scores was not significant for boys and girls when rated by parents and teachers on anger/frustration ( $SD=.80, .88; 1.07, 1.08$ ) and by teachers on regulation ( $SD=.67, .63$ ).

A study by De Boo and Kolk (2007) investigated temperamental differences in 9- to 13-year-olds ( $N=423$ ;  $M$  age=10.7 years) and their relationship with depressive and aggressive mood across four different ethnicities. Differences in temperament were found that that were not influenced by ethnicity. Girls scored higher on positive affectivity across all four ethnicities and it was significant for the Dutch ( $d=-.39$ ), Moroccan ( $d=-.34$ ), and Mixed Ethnic ( $d=-.32$ ) groups. This pattern was reversed in Else-Quest's (2006) meta-analysis based mostly on Western white samples. A pattern similar to De Boo and colleagues' (2007) was also found in a Chinese sample of six- and seven-year-olds using parent ratings on the CBQ (Ahadi, 1993).

Interestingly, De Boo and Spiering (2010) found that pre-adolescent ( $M$  age=10.0 years) girls scored higher than boys on both positive affectivity ( $d=-.26$ ) and negative affectivity ( $d=-.19$ ) on self-ratings of temperament on the Dutch adaptation of the *Early Adolescent Temperament Questionnaire, Revised* (EATQ-R; Ellis & Rothbart, 2001; De Boo & Kolk, 2007).

No significant differences in standard deviations between boys and girls were found when calculated by this author using the *F*-test.

Komsi et al. (2008) found gender differences on the CBQ for sadness ( $d=-.21$ ) with girls rated higher and falling reactivity/soothability ( $d=.30$ ) with boys rated higher by fathers. On the IBQ-R, this author found little or no variability in the scores between infant girls and boys except on fear with girls ( $SD=.74$ ) being rated with significantly more variability than boys ( $SD=.56$ ;  $F(64, 49)=1.75$ ;  $p<.05$ ). There were no significant differences in standard deviations between boys and girls on the CBQ.

Significant gender differences were found by Komsi et al. (2006) with infant girls rated higher by mothers on fear ( $d=-.21$ ) on the IBQ-R and preschool girls rated higher on sadness ( $d=-.26$ ) on the CBQ. Variability in scores differed most notably between girls and boys, respectively, on the dimensions of anger/frustration ( $SD=.87, .98$ ;  $F(114, 115)=1.26$ ,  $p>.05$ ) and shyness ( $SD=1.09, 1.22$ ;  $F(114, 115)=1.25$ ,  $p>.05$ ), though they were not significantly different when calculated by the current author.

Pesonen, Raikkonen, Kajantie, Heinonen, Strandberg, and Jarvenpaa (2006) examined negative affectivity in preschoolers ( $N=416$ ) and found that girls were rated by mothers on the CBQ to have higher levels of sadness ( $d=-.22$ ), whereas boys were rated significantly higher than girls on anger ( $d=.26$ ). Ratings on fear yielded the most variability between genders with girls ( $SD=1.09$ ) being rated with significantly more variability than boys ( $SD=.96$ ;  $F(215, 199)=1.29$ ,  $p<.05$ ) when analyzed by this author.

Gleason et al. (2005) found that girls were rated by teachers as being more soothable than boys in three of the classroom samples ( $d=-.42, -1.20, -.27$ ) on the CBQ-SF. On soothability,

boys ( $SD=.79$ ) were rated with more variability than girls ( $SD=.38$ ) in one classroom ( $F(6, 8)=4.32; p<.05$ ) when calculated by this author.

DeThorne and colleagues (2011) found that girls were rated by parents to have significantly higher levels of sadness ( $d=-.41$ ) than boys on the CBQ-SF, though the standard deviations could not be analyzed because the authors did not provide the information.

Casalin et al. (2012) discovered that, when rated by mothers, infant girls were rated significantly higher with effect sizes that were small in magnitude on negative affectivity ( $d=-.34$ ), though no significant differences in variability were found.

**Conclusion.** In conclusion, one study found significant gender differences on the negative affectivity superfactor with girls rated higher than boys (maternal ratings; Casalin et al., 2012), though one study did not (child self-reports; De Boo & Spiering, 2010; see Appendix A). Two studies did not find significant gender differences between boys and girls on anger (parent ratings; Komsis et al., 2006; Olson et al., 2005), whereas two studies found significant differences when rated by teachers and not when rated by parents (Hanish et al., 2004; Zhou et al., 2004). Girls were rated higher than boys on sadness (parent ratings; DeThorne et al., 2011; Komsis et al., 2006; Komsis et al., 2008; Pesonen et al., 2006), and boys were rated higher on falling reactivity/soothability (parent ratings; Komsis et al., 2008). Girls were also rated higher on shyness, though it was not significant (parent ratings; Rudasill, 2011; Rudasill & Rimm-Kaufman, 2009). One study found that girls from Dutch, Moroccan, and Mixed Ethnic ethnicities were rated higher than boys on positive affectivity (child self-reports; De Boo & Kolk, 2007), though Else-Quest and colleagues (2006) found a reversed pattern with their mostly Western white sample. When analyzed by the current author, preschool boys and girls were generally rated with similar variability on negative affectivity on the CBQ, except for more

variability for girls on fear (Pesonen et al., 2006) and more variability for boys on soothability (Gleason et al., 2005).

**Extraversion/surgency.** Else-Quest, et al.'s (2006) meta-analysis also found small effect sizes with boys scoring higher on the dimensions of activity level, high intensity pleasure, and impulsivity, which has been found repeatedly in the literature (Martin, Wisenbaker, Baker, and Huttunen, 1997). After age 18 months, a male increase is seen for activity level, and at the preschool age, the gender difference for activity level remains (Else-Quest, et al., 2006). When considering theories of gender differences in children and gender role norms, the findings for low- and high intensity pleasure are also expected and consistent with Maccoby's (1998) theory and work (Else-Quest, et al., 2006). The theory suggests that children tend to favor same-gender peer play, during which low-intensity activities (e.g., girls playing "house") and high-intensity activities (e.g., boys engaging in "rough-and-tumble" play) are likely to take place in gender-separated groups (Else-Quest, et al., 2006).

Yoleri and Gursimsek (2012) studied the relation of parent-rated temperament on the *Short Temperament Scale for Children* (STSC; Prior, Sanson, & Oberklaid, 1989) to peer victimization in Turkish 5- to 6-year-old children ( $N=211$ ). When combining 5- and 6-year old samples together, boys were found to be significantly higher in approach ( $d=.32$ ), though the effect were small in magnitude. Boys were only found to be significantly more reactive ( $d=.27$ ) than girls at age six. Boys were rated significantly higher on approach ( $d=.56$ ) at age 5, but not at age 6 ( $d=.04$ ). There was more variability in the standard deviations of five-year-old girls and boys compared to six-year-olds, though it was not significantly different. For five-year-olds, the most variability between standard deviations of girls and boys, respectively, occurred on the dimensions of approach-withdrawal ( $SD=7.2, 5.7$ ) and reactivity ( $SD=6.5, 7.6$ ), though they were

not statistically different when calculated by the current author.

Gartstein, Slobodskaya, Zylicz, Gosztyła, and Nakagawa (2010) studied the early development of temperament in infants aged 3 to 12 months ( $N=236$ ) across the four cultures of Japan, United States (U.S.), Poland, and Russia. On the IBQ-R, gender differences were observed across all four cultures. Significant gender differences emerged for high intensity pleasure ( $d=.37$ ) and approach ( $d=.37$ ), with boys receiving higher scores than girls. These results are consistent with previous reports based on U.S. participants alone (Gartstein & Rothbart, 2003), indicating that male infants receive higher ratings for these extraversion/surgency-related characteristics. There were no significant differences found by the present author in the standard deviations for boys and girls on parent ratings of high intensity pleasure and approach, and the results of this study indicated that such gender differences may be generalized cross-culturally.

Casalin et al. (2012) found that, in infancy, there were no gender differences on extraversion/surgency subscales when rated by fathers. However, when rated by fathers in toddlerhood, boys were rated to be significantly higher on extraversion/surgency with a moderate effect size ( $d=.69$ ).

Blandon and colleagues (2010) investigated 4- to 7-year olds' ( $N=370$ ) temperamental reactivity consisting of negative affectivity and surgency. Girls were rated to have significantly lower levels of surgency at age 7 compared to boys at age 7; however, means, standard deviations, and effect sizes were not available by gender nor was the distribution of scores described.

Komsi and colleagues (2008) found gender differences for smiling/laughter on the IBQ-R with boys ( $M$  age=6.5 months) scoring higher ( $d=.21$ ) when rated by fathers. On the father-rated

CBQ, gender differences that were small in magnitude included girls rated higher on positive anticipation ( $d=-.20$ ) and boys ( $M$  age=5.5 years) rated higher on high intensity pleasure ( $d=.29$ ). There was some slight variability in standard deviations between boys and girls, respectively, on the dimensions of positive anticipation ( $SD=.49, .67$ ), high intensity pleasure ( $SD=.85, .72$ ), impulsivity ( $SD=.68, .85$ ), and smiling/laughter ( $SD=.70, .57$ ), though they did not reach statistical significance when calculated by the current author.

Komsi and colleagues (2006) found gender differences on the IBQ-R for activity level with boys rated significantly higher than girls ( $d=.44$ ). On the CBQ, they found that boys were rated higher than girls on activity level ( $d=.23$ ) and high intensity pleasure ( $d=.37$ ). Spinrad et al. (2006) also found that boys were rated as having higher levels of impulsivity on the CBQ at ages 4 and 7 years by both mothers ( $d=.23, .38$ ) and teachers ( $d=.38, .44$ ).

Gleason, Gower, Hohmann, and Gleason (2005) studied temperament and friendship in preschool children ( $N=75$ ) and found that teachers rated boys in five different classrooms as having a higher activity level ( $d=1.59, 1.36, .15, .90, 1.39$ ) than girls as rated on the CBQ-SF. Boys were rated to have higher impulsivity than girls in three of the classrooms ( $d=.52, 1.82, 1.43$ ). On activity level, boys ( $SD=1.26$ ) were rated with significantly more variability than girls ( $SD=.67$ ) in one classroom ( $F(6, 8)=3.53; p<.05$ ), whereas girls ( $SD=.98$ ) were rated with significantly more variability than boys ( $SD=.35$ ) in another classroom ( $F(4, 6)=7.84; p<.01$ ) when calculated by this author. These findings are not explained by the authors of the study and when analyzing possible factors. It was discovered that boys were older (girls  $M$  age=64.4 months; boys  $M$  age=66.9 months) when rated with more variability in one classroom, yet they were also older (girls  $M$  age=55.0 months; boys  $M$  age=57.9 months) when rated with less variability in another classroom. On impulsivity, boys ( $SD=1.18$ ) were rated with significantly



more variability than girls ( $SD=.60$ ) in one classroom ( $F(6, 8)=3.86; p<.05$ ).

Gagne and colleagues (2013) found that girls were rated to have higher levels of shyness by both mothers ( $d=-.35$ ) and fathers ( $d=-.17$ ), whereas boys were rated to have higher activity levels by both mothers ( $d=.36$ ) and fathers ( $d=.38$ ). When analyzed by this author, the variability in the distribution of scores from the mean was similar for both boys and girls for mothers and fathers on shyness ( $SD=.96, .98; .92, .98$ ) and activity level ( $SD=.93, 1.02; .93, .98$ ).

Booth-LaForce and Oxford (2008) found that girls were rated to have slightly higher levels of approach on the ITQ, though it was not significant ( $d=-.18$ ), and standard deviations between genders could not be compared because the information was not provided by the authors.

**Conclusion.** Overall, boys were rated higher on extraversion/surgency (Blandon et al., 2010; Casalin et al., 2012), high intensity pleasure (Gartstein et al., 2010; Komsı et al., 2006; Komsı et al., 2008), approach (Gartstein et al., 2010; Yolerı & Gursimsek, 2012), activity level (Gagne et al., 2013; Gleason et al., 2005; Komsı et al., 2006), impulsivity (Gleason et al., 2005), and smiling and laughter (Komsı et al., 2008), whereas girls were rated higher on positive anticipation (Komsı et al., 2008) and shyness (Gagne et al., 2013; see Appendix A). Overall, no significant variability was found between boys and girls on high intensity pleasure (Gartstein et al., 2010), approach (Gartstein et al., 2010), shyness (Gagne et al., 2013), and activity level (Gagne et al., 2013) when calculated by this author.

**General conclusions for temperament, gender, and rater source.** Meta-analyses have found that measures completed by parents are less likely to show gender differences than measures completed by teachers (Else-Quest et al., 2006). In the current literature review (see Appendix A), both raters rated girls higher than boys on effortful control, though a small effect

size was found for parent ratings and a moderate effect size was found for teacher ratings (Spinrad et al., 2006; Zhou et al., 2004). Similarly, boys were rated with higher levels of impulsivity (Spinrad et al., 2006) and anger/frustration (Hanish et al., 2004) by both raters, and teachers' ratings yielded larger effect sizes than parents'. In one study, teachers rated boys higher than girls on anger with a moderate effect size, and no gender differences were found for parent ratings (Zhou et al., 2004). Teachers also rated boys higher in activity level, negative emotionality, and distractibility (Mullola et al., 2011; Mullola et al., 2012).

Overall, there were few studies that yielded significant differences in variability between boys and girls on variables of temperament when calculated by this author. For effortful control, several studies found that mothers rated boys with more variability than girls and no variability was found for teacher ratings (Komsis et al., 2006; Olson et al., 2005; Spinrad et al., 2006). On subscales of negative affectivity, girls were rated with more variability on fear by mothers (Pesonen et al., 2006) and boys with more variability on soothability by teachers (Gleason et al., 2005). For extraversion/surgency, no significant variability was found between boys and girls on high intensity pleasure (Gartstein et al., 2010), approach (Gartstein et al., 2010), shyness (Gagne et al., 2013), and activity level (Gagne et al., 2013).

### **Social Competence**

In general, social competencies are regulatory tools that aim to meet situational demands and general social expectations (Rothbart & Bates, 1998). In order to behave in a socially competent manner and act appropriately in a given situation, knowledge of situational demands, including social expectations, and recognition of other's emotions are necessary. Ladd (2005) outlined the history of research on social competence (SC) and its many conceptualizations,

including SC being defined as assertion, frequency of interaction, positive self-concept, social cognitive skills, popularity, quality of peer and adult relationships, and so on.

More recently, the term SC is used to describe a range of behavioral and relational abilities, including the ability to: 1) initiate and sustain positive peer interactions and inhibit negative behaviors, 2) form ties through friendships and group acceptance, 3) sustain positive peer relationships, and 4) avoid negative peer relationships and roles, such as victimization, rejection, and isolation (Ladd, 2005). Generally, SC is recognized as effectiveness in interaction, considered from both the self and others' perspective.

During the 1990s and thereafter, researchers created frameworks for understanding how children's behaviors and their peer relationships might contribute to their adjustment and development (Ladd, 2005). These perspectives are known as "child-by-environment" models and refer to development as progressing along complex pathways during which child characteristics and aspects of the child's socialization combine in interactive patterns to form particular child outcomes (Ladd, 2005).

**Conceptualization of the construct.** SC has been described in various ways and its definitions have evolved over time. Dodge (1985) noted that there are nearly as many definitions of SC as there are researchers investigating the construct. Most definitions of SC include effectiveness in interaction (Rubin & Rose-Krasnor, 1992) and Rose-Krasnor (1997) indicated that four general definitions have surfaced in the literature, including: a) specific skills, b) sociometric status, c) relationships, and d) functional outcomes. Rose-Krasnor's (1997) prism model hierarchically organizes these concepts and defines competence broadly as "effectiveness in interaction" while considering one's motivations and goals in the social context.

First, SC has been defined as a set of desirable skills. Skills-based approaches often use behavior checklists to identify the presence or lack of particular skills in children that are considered to be predictive of SC.

Second, peer status approaches are based on the premise that being popular or well-liked by peers measures SC. This is measured through sociometric assessments, which combine the judgments of peers. Sociometrics are ideal for identifying children who lack SC, but they do not explain the type or cause of the social difficulties.

Third, relationship approaches to SC posit that positive relationships formed by the child with others are indicative of SC. This approach assesses the quality of a child's relationships with others, including friendship and attachment, and highlights the transactional nature of SC. However, it is important to note that measuring SC through this approach can be problematic due to the fact that relationships depend on the contributions and skill sets of both parties involved.

Fourth, functional approaches to SC focus on the outcomes of social behavior, such as social goals and tasks, and the processes that lead to them. Social outcomes are the joint result of a child's actions and others' responses to the actions. This approach considers how the person and environment interact to produce social behavior, as well as the social-cognitive process that results. This process consists of choosing a social goal, monitoring the environment, choosing a strategy, planning, implementing and evaluating it, and then selecting a consequent action. Effective goal attainment and how well one balances the self with others is an approach that recognizes that children have differing goals and meeting such goals in the group context results in transactional challenges in the social group (Rubin & Rose-Krasnor, 1992). Though these models consider the role of the self, they still regard group affiliation as an important criterion.

**Measuring social competence.** Stump, Ratliff, Wu, and Hawley (2009) outlined common approaches used by researchers to develop measures of SC. The top-down approach refers to analyzing and outlining different manifestations of SC, including identifying behaviors that are thought to be socially competent, and then investigating common underpinnings. Conversely, the bottom-up approach considers the nature of the child interacting in his or her environment and examines underlying behaviors in order to form a cohesive understanding of the construct. Bukowski (2003) found that “competence” shares a common linguistic background with the concept “compete” and suggested that competence means that one is able to compete when surrounded by others. Researchers have noted the dynamic nature of SC in that it may not translate as socially competent in another context, and many qualities that are considered to be indicative of SC reflect culturally-specific values. Ogbu (1981) described the “competent bias” as being inherent in models that reflect a cluster of ideals that may not result in competence in different cultures or contexts. For instance, certain behaviors may lead to adaptive functioning in harsh or chaotic environments, though they are considered maladaptive or unskilled in other contexts. Because SC may manifest and be defined differently in varying contexts, it is essential to consider the rater source and his/her perspective that is shaped by the environment in which the child is typically observed.

Peer regard approaches consider social successes and how positively one is received in a social context. Many peer relations researchers consider social preference and acceptance to be strong indices of SC. Stump et al. (2009) asserted that aggression is consistently considered to be an index of social incompetence, which could be due to the fact that aggression is often associated with peer rejection. In addition, different forms of aggression (e.g., physical, relational) has associations with skill sets (e.g., perspective taking) and temperamental traits

(e.g., agreeableness; Coie & Dodge, 1998). Some types of aggression, such as instrumental aggression, require a certain amount of social skills and may be a form of SC as well. This approach lends itself to the use of sociometric and peer ratings, though adult raters may also be valuable resources for measuring peer regard.

*Questionnaires measuring social competence.* Julvez, Forns, Ribas-Fito, Mazon, Torrent, Garcia-Esteban, and Sunyer (2008) reviewed the available SC rating scales typically used for both research and clinical purposes, and listed the following scales: the *Devereux Elementary School Behavior Rating Scale* (Spivack & Swift, 1966), *California Preschool Social Competency Scale* (CPSCS; Levin, Elzey, & Lewis, 1969), *Social Competence Scale and Symptom Checklist* (Kohn & Rosman, 1972), *Preschool Behavior Questionnaire* (Behar & Stringfield, 1974), *Classroom Behavior Inventory* (Schaefer, 1975), *Social Skills Rating Scale* (SSRS; Gresham, Elliott, & Black, 1987), *Teacher–Child Rating Scale* (Hightower, 1987), *Walker–McConnell Scale of Social Competence and School Adjustment* (Walker & McConnell, 1988), and the *Social Competence and Behavior Evaluation* (SCBE; LaFreniere & Dumas, 1992).

Julvez and colleagues (2008) indicated that these measures assess varying constructs, despite having been named or thought of as measures of SC. Some of the scales and composites derived from the measures listed include: “anxiety, apathy–withdrawal, assertiveness, self-control, cooperation-compliance, creative–initiative, learning competence, dependent/autonomous, depressive/happy, externalizing/internalizing behaviors, hostility/considerateness, and hyperactivity/distractibility/impatience” (p.797). This range of constructs subsumed in the term SC reinforces the fact that caution must be used when comparing the results of studies investigating SC.

## **Gender Differences in Social Competence**

Much of the literature has shown that girls tend to display more socially competent behaviors than boys (e.g., Coolahan, Fantuzzo, Mendez, & McDermott, 2000), and therefore, studies of socially competent behavior and its correlates must consider the factor of gender (Griggs et al., 2009; see Appendix B). It is thought that boys and girls may possess a different background of social experiences because of gender segregation in play that begins at a young age and lasts into adolescence, thus resulting in a different set of norms. A different skill set may also develop in order for boys and girls to be successful in their differing social interactions. Rose-Krasnor (1997) asserted that, because boys tend to play in larger groups and girls tend to play in small groups or dyads, boys might have social goals of group acceptance, whereas girls may hold goals for building friendships.

It is during the preschool years that gender identity and gender role preferences encounter rapid development as children gradually begin to acquire the behaviors and attitudes considered to be “gender appropriate” (Serbin, Powlishta, & Gulko, 1993). Therefore, it is possible that competent behavior and successful social cognitive functioning may be defined differently for boys and girls at the preschool age (Walker, 2005). The skills and behaviors that are regarded to be competent may differ by gender due to social norms and expectations of peers and adults, and as early as 4- or 5-years-old, boys and girls may have different profiles of socially competent behavior (Walker, 2005).

Teachers frequently rate boys as more likely to engage in aggressive or disruptive behavior compared to girls, though boys are not rated to be less likely to engage in prosocial behavior (Walker, 2005). By age two or three years, boys consistently exhibit more physical and verbal aggression than girls (Coie & Dodge, 1998; Maccoby & Jacklin, 1980; Walker, 2005).

Interestingly, Gunnar, Sebanc, Tout, Donzella, and van Dulmen (2003) noted that in a number of studies investigating the associations between temperament and peer relations, the results have only held for boys. For example, Eisenberg, Fabes, Bernzweig, Karbon, Poulin, and Hanish (1993) found that effortful control was a moderator for the relationship between negative emotionality and peer relationships, but only for boys.

Zhou, Eisenberg, Wang, and Reiser (2004) measured SC in Chinese school-age children ( $M$  age=92 months) using parent, teacher, and peer ratings ( $N=425$ ). On *Harter's Perceived Competence Scale for Children* (Eisenberg, Valiente, Fabes, 2003; Harter & Pike, 1984), a small effect size for gender was found for parent ratings ( $d=-.32$ ) but not for teacher ratings ( $d=-.06$ ). Parents rated girls and boys with similar variability ( $SD=.84, .83$ ) compared to teachers who rated the groups with significantly more variability on SC ( $SD=.53, .91$ ;  $F(235, 188)=1.71$ ,  $p<.01$ ). On the *Chinese Version of the Revised Class Play* (RCP; Masten, Morison, & Pelligrini, 1985; Chen, Rubin, & Sun, 1992), peers rated boys significantly higher than girls on aggression ( $d=.76$ ) and girls significantly higher than boys on leadership/sociability ( $d=-.43$ ). When analyzed by the current author based on information provided in the published study, boys were rated by their peers with significantly more variability than girls on aggression ( $SD=1.01, .33$ ;  $F(188, 235)= 3.06$ ,  $p<.01$ ) and significantly less variability on leadership ( $SD=.65, .87$ ;  $F(188, 235)=1.34$ ,  $p<.05$ ).

Walker (2005) found that on the teacher-rated *Profile of Peer Relations* (PPR; Walker, Berthelsen, & Irving, 2000), both older boys and girls (4- to 5-year olds) were rated as exhibiting more prosocial behavior than younger boys and girls (3- to 4-year olds), though there were not significant differences found between genders at either age. Teachers rated older boys as significantly more likely than younger boys to engage in aggressive or disruptive behavior and



less likely than younger boys to display shy or withdrawn behavior, though such age differences were not found for girls. The standard deviations of raw scores for girls and boys on the Aggressive-Disruptive, Prosocial, and Shy/Withdrawn scales of the PPR were not statistically different between boys and girls.

Spinrad and colleagues (2006) measured SC at two different time periods (age range=4.5-7.9 years;  $N=214$ ; 193) through mother and teacher ratings on a 7-item scale (called socially appropriate behavior) adapted from *Harter's Perceived Competence Scale for Children* (Eisenberg, Valiente, & Fabes, 2003; Harter & Pike, 1984). At both Time 1 and 2, mothers and teachers rated girls higher than boys on socially appropriate behavior (Mothers  $d=-.39$ ,  $-.36$ ; Teachers  $d=-.67$ ,  $-.73$ ). The effect sizes from mother ratings were small in magnitude, whereas moderate to large effect sizes were found on teacher ratings. When calculated by the current author, both mothers and teachers rated boys with more variability than girls at Time 1 (Mothers  $SD=.71$ ,  $.56$ ; Teachers  $SD=.83$ ,  $.61$ ;  $F(118, 96)=1.36$ ,  $p<.05$ ) and Time 2 (Mothers  $SD=.71$ ,  $.50$ ;  $F(105, 88)=1.42$ ,  $p<.05$ ; Teachers  $SD=.78$ ,  $.63$ ), though it was only statistically significant at Time 1 for teachers and at Time 2 for mothers.

On the *Social Competence Inventory* (SCI; Rydell, Hagekull, & Bohlin, 1997), girls were rated higher on prosocial orientation (e.g., gives compliments to others, shows generosity towards peers) compared to boys ( $d=-.52$ ) when using raw scores, and no means or standard deviations were reported (Henricsson & Rydell, 2004).

Whereas some studies have indicated that girls are more socially competent and better accepted by peers than boys (LaFreniere & Dumas, 1996), others have found that boys were rated by teachers as having more socially assertive skills than girls (Sebanc, Pierce, Cheatham, and Gunnar, 2003). Sebanc and colleagues (2003) indicated that their findings pointed to gender

differences mostly in the structure of SC in that dominance, peer acceptance, and teacher reports of assertive social skills were more strongly correlated with each other for boys than for girls. In one study, no significant differences were found between girls and boys ( $d=-.16$ ) on the teacher-rated SSRS (Gresham & Elliott, 1990) and means and standard deviations were not reported by the authors (Booth-LaForce & Oxford, 2008). The SSRS (Gresham & Elliott, 1990) converts raw scores to gender-normed standardized scores implying that gender differences inherently exist on the measure.

**Gender differences on the SCBE.** The *Social Competence Behavior Evaluation (SCBE;* LaFreniere & Dumas, 1992), originally titled the *Preschool Socioaffective Profile (PSP;* LaFreniere, Dumas, Capuano, & Dubeau, 1992), is a commonly used questionnaire to measure SC and is typically completed by preschool teachers. Overall, the SCBE was originally designed to: “a) provide a standard description of behavior in context that is reliable, valid, and useful for preschool teachers, b) differentiate specific types of problems, c) provide an assessment of children’s positive social adaptation or competence, d)...derive [scales]...[that] should yield variables of approximately equivalent internal consistency, reliability, and stability, and e)...be sensitive to behavioral change over time to evaluate short-term treatment outcomes” (LaFreniere and Dumas, 1996, p. 370).

The measure has been widely used in research across several countries. It has been given as an outcome measure of treatment effects in intervention studies and in experimental research investigating varying aspects of social and emotional development (LaFreniere et al., 1992). In addition to research, the SCBE has been used in educational and clinical settings, including public and private daycare centers and preschools, as a screener for identifying high-risk children and to measure aspects of behavioral and emotional concerns in children.

The SCBE yields four summary scales, including: Social Competence, Internalizing Problems, Externalizing Problems, and General Adaptation. Specifically, the Social Competence scale is designed to assess the positive qualities of a child's adaptation and "refers to behaviors that indicate a well-adjusted, flexible, emotionally mature, and generally prosocial pattern of adaptation" (p. 1; LaFreniere & Dumas, 2003). The authors noted that socially competent children show high levels of social skills and emotional maturity, and are well-liked by peers and teachers. Among preschool children, the expression of positive affect is associated with peer acceptance, leadership, and positive evaluations of SC by teachers (LaFreniere & Dumas, 2003).

During scoring, raw scores are converted to T-scores using separate normative information for boys and girls, and children are only compared to those of the same gender in the standardization sample. Lower T-scores on the eight scales indicate more problematic adjustment compared to higher scores, which indicate better adjustment.

Preliminary raw score data investigating the psychometric properties of the SCBE using a sample of preschoolers ( $N=916$ ) from Quebec, Canada (Table 1) indicated that girls were rated more positively than boys on all eight subscales, as well as significantly more positively on the Social Competence and General Adaptation scales. Boys were rated to have significantly higher levels of Externalizing Problems. In both the Indiana (Table 2) and Colorado (Table 3) samples, boys were assessed significantly more negatively than girls on Externalizing Problems (and each of the scales associated with this factor), Social Competence, and General Adaptation, which replicates the findings of the Quebec study.

Table 1

*Preliminary Data on the Raw Scores of the SCBE scales for the Quebec Sample*

Scale	Girls (N=458)		Boys (N=458)		Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Depressive-Joyful	2.40	1.33	2.16	1.35	-.19
Anxious-Secure	2.32	1.23	2.05	1.31	-.22
Angry-Tolerant	1.18	1.56	.77	1.67	-.27*
Isolated-Integrated	2.13	1.40	2.01	1.44	-.09
Aggressive-Calm	2.07	1.47	1.26	1.60	-.55*
Egotistical-Prosocial	1.21	1.48	.61	1.43	-.44*
Oppositional-Cooperative	2.43	1.37	1.98	1.45	-.34*
Dependent-Autonomous	1.50	1.3	1.36	1.42	-.10
Social Competence	4.01	0.61	3.77	0.78	-.38*
Internalizing Problems	2.06	0.52	2.09	0.61	.05
Externalizing Problems	2.15	0.78	2.40	0.82	.34*
General Adaptation	1.91	1.04	1.53	1.04	-.39*

\* $p < .05$ .

Table 2

*Gender Differences on the Raw Scores of the SCBE scales for the Indiana Sample*

Scale	Girls (N=419)		Boys (N=405)		Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Depressive-Joyful	2.58	1.53	2.32	1.52	-.17
Anxious-Secure	2.35	1.57	2.24	1.51	-.07
Angry-Tolerant	2.02	1.85	1.49	1.95	-.28*
Isolated-Integrated	2.19	1.67	1.97	1.79	-.13
Aggressive-Calm	2.04	1.51	1.37	1.80	-.40*
Egotistical-Prosocial	1.67	1.60	1.17	1.66	-.31*
Oppositional-Cooperative	2.83	1.62	2.27	1.95	-.32*
Dependent-Autonomous	2.18	1.64	1.99	1.57	-.12
Social Competence	4.16	0.85	3.93	0.82	-.29*
Internalizing Problems	1.97	0.78	2.00	0.63	.04
Externalizing Problems	1.88	0.86	2.15	0.90	.32*
General Adaptation	2.23	1.22	1.86	1.73	-.29*

\* $p < .05$ .

Table 3

*Gender Differences on the Raw Scores of the SCBE scales for the Colorado Sample*

Scale	Girls (N=212)		Boys (N=227)		Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Depressive-Joyful	2.70	1.48	2.47	1.51	-.15
Anxious-Secure	2.72	1.42	2.40	1.60	-.21*
Angry-Tolerant	2.40	1.76	1.92	1.95	-.26*
Isolated-Integrated	2.32	1.74	2.07	1.81	-.14
Aggressive-Calm	2.46	1.63	2.06	1.88	-.23*
Egotistical-Prosocial	2.14	1.71	1.57	1.75	-.33*
Oppositional-Cooperative	3.23	1.50	2.79	1.72	-.27*
Dependent-Autonomous	2.41	1.78	2.25	1.64	-.09
Social Competence	4.38	0.95	4.16	0.94	-.24*
Internalizing Problems	1.90	0.63	1.99	0.72	.13
Externalizing Problems	1.76	0.72	1.96	0.88	.26*
General Adaptation	2.55	1.31	2.19	1.44	-.26*

\* $p < .05$ .

An abbreviated version of the original SCBE was later developed and several cross-cultural validation studies have been conducted since (LaFreniere & Dumas, 1996; LaFreniere et al., 2003). LaFreniere and Dumas (1996) found that their data were robust in showing gender differences during the validation of the *Social Competence and Behavior Evaluation Scale: Short Form (SCBE-30)*, especially given the extensive samples of children included in the study. Using standard scores, boys were shown to be rated significantly lower on SC than girls. This would suggest that boys are not as well-adapted to the preschool classroom setting as girls based on teachers' perspectives. However, it is important to note that over 95 percent of teachers included in the study were female and the data were gathered from several hundred preschool programs that are representative of preschools in North America (LaFreniere and Dumas, 1996).

In Russian children ages three to six years, significant gender differences were found on the SCBE-30 ( $N=217$ ). Butovskaya and Demianovitsch (2002) found more gender differences in the standard scores in older children (5- and 6-year-olds) compared to younger children (3- and 4-year olds). Moderate effect sizes were found for 5-year olds with girls rated higher than boys on SC ( $d=-.68$ ). A small effect size was found for SC in 6-year-olds with girls rated higher than boys ( $d=-.35$ ) and with significantly more variability than boys ( $SD=10.93, 7.32; F(112, 105)=1.49, p<.01$ ) when calculated by the current author.

Certain gender differences in correlations between scales were also observed. No correlation was found between T-scores on SC and anger-aggression and between anger-aggression and anxiety-withdrawal in boys. However, for girls this was not the case, suggesting that more aggressive girls were rated, at times, by teachers as less socially competent. This association was not found to be true when teachers rated boys' behaviors (Butovskaya & Demianovitsch, 2002). Butovskaya and Demianovitsch (2002) found that boys were rated higher

on anger-aggression measures and lower on SC than girls (Butovskaya & Demianovitsch, 2002), which is similar to what other researchers have found when comparing raw scores (LaFreniere & Dumas, 1996; Dumas et al., 1997).

Bigras and Auxiliadora Dessen (2002) found that in Brazilian preschoolers, girls ( $M=3.89$ ,  $SD=1.19$ ) were assessed by parents to be more socially competent ( $t = 4.28$ ,  $p <.01$ ) and less angry-aggressive than boys ( $M=3.31$ ,  $SD=1.04$ ) on the SCBE – Parent Version (SCBE-P) using raw scores, though girls' and boys' standard deviations on raw scores of SC were not found to be significantly different ( $SD=1.19$ ,  $1.04$ ) when calculated by the current author. Kotler and McMahon (2002) also found a significant gender difference ( $d=-.71$ ) with girls rated higher than boys on SC on the SCBE-30-P ( $N=218$ ), though the authors reported using standard scores.

Kranzelic and Basic (2008) found that in a randomly stratified sample of preschoolers ages 3 to 6.5 years in the Republic of Croatia, statistically significant differences were found between boys and girls on the SCBE-30. Girls were found to have higher SC T-scores than boys as rated by preschool teachers. Additionally, girls showed less externalizing problems than boys based on the anger-aggression scale of the SCBE-30 when rated by teachers (Kranzelic & Basic, 2008).

Zhang (2011) examined the interactive effects of gender and maternal education on initial levels of SC and its growth over time. The SC of preschoolers living in Beijing, China ( $N=119$ ) was rated by mothers on the SCBE-30 at three different time points, including three months after preschool entry, the end of the first preschool year, and the end of the second preschool year. Girls were rated to have higher initial levels of SC than boys using standard scores, though significant variability in the initial levels and growth were also found (Zhang, 2011). Means and SDs were not reported for this study.



**Conclusions.** Overall, mothers and teachers rated girls higher than boys on socially competent behavior when using raw scores (Bigras & Auxiliadora Dessen, 2002; Henricsson & Rydell, 2004; LaFreniere & Dumas, 1995; Spinrad et al., 2006). In one study, a small effect size was found for girls being rated higher than boys on SC by mothers, while a moderate effect size was found for girls being rated higher than boys by teachers (Spinrad et al., 2006). In one study, no gender differences were found when using standard scores on the SSRS (Booth-LaForce & Oxford, 2008). However, boys were rated lower on SC than girls when using gender-normed T-scores on the SCBE-30 (Butovskaya & Demianovitsch, 2002; Kotler & McMahon, 2002; Kranzelic & Basic, 2008; LaFreniere & Dumas, 1996; Zhang, 2011).

Based on variability calculations conducted by this author, teachers rated boys and girls with significant differences in variability on SC (Butovskaya & Demianovitsch, 2002; Spinrad et al., 2006; Zhou et al., 2004), and in one study, parents rated boys and girls with significant differences in variability (Spinrad et al., 2006). However, two studies' data showed that both parents and teachers rated boys and girls without significant differences in variability across boys and girls (Walker, 2005; Zhou et al., 2004).

### **Social Competence and Theoretical Links to Temperament**

A large body of research has supported the relation between temperament and social and behavioral outcomes. Genetic perspectives of behavior assert that heredity and genetic influences play a role in addition to environmental influences when determining aspects of children's personality and social development. Children's heritable characteristics, such as temperament, affect how children are treated by socializers, such as parents, teachers, and peers. Therefore, the influences of heredity and environment are related (Ladd, 2005).

The conceptual model that underlies much of the research investigating the link between temperament and social functioning underscores that a child's temperament influences children's behaviors with peers. Eisenberg's (2009) theoretical model suggests that child temperament influences the quality of children's behaviors with peers, friendships, and peer status, which then affects the child's social-emotional functioning. Sterry, Reiter-Purtill, Gartstein, Gerhardt, Vannatta, and Noll (2010) found that social behaviors mediated the relationship between child temperamental traits, including activity level, attentional focusing, and adaptability, and peer acceptance.

Children's peer interactions may also be considered an important context that moderates the relationship between temperament and adjustment outcomes, such as SC. Rothbart and Bates (2008) viewed the relationship between temperament and SC as a complex interactional model based on "child x environment" and Thomas and Chess's "goodness-of-fit" concept. These refer to the level of match between a child's temperament and the demands and expectations of their environment, including the child's peer relations.

Although negative emotionality is often emphasized as a risk factor for adjustment problems, positive emotionality is important to children's day-to-day interactions and development of social competence. Fredrickson's (1998, 2001) broaden-and-build theory of positive emotions provides insight into how temperament may influence a child's social interactions and social competence. The concept of "specific action tendencies" links specific emotions to corresponding actions (Oatley & Jenkins, 1996). Positive emotions, such as joy, interest, contentment, and love, are exhibited when individuals are not overcome with negative emotions, such as anxiety, sadness, or fear. Several studies have found that positive affect allows approach behavior to occur, which, in turn, allows individuals to engage with others and

their environment (Sanson, Hemphill, & Smart, 2004). Fear is often expressed as the need to escape, or anger manifested as the urge to attack, and expressions of these negative emotions are considered socially incompetent and anti-social behaviors.

According to Fredrickson's (1998) broaden-and-build theory, positive emotions broaden behavioral repertoires, improve behavioral flexibility, and increase attentional scope, all of which seem to enhance social interaction. The theory states that distinct positive emotions share the ability to expand an individual's thought-action repertoires and form their long-term personal resources, including physical, intellectual, social, and psychological resources. Joy, for example, broadens by creating the urge to play, push the limits, and be creative (Ellsworth & Smith, 1988). Interest, another positive emotion, broadens by creating the urge to explore, take in new information and experiences, and expand the self (Izard, 1977; Ryan & Deci, 2000). Contentment, a third distinct positive emotion, broadens by creating the urge to enjoy present circumstances and integrate them into new outlooks of the world (Izard, 1977). Pride, a fourth distinct positive emotion, broadens by creating the urge to share the achievement with others and set the goal of future greater achievements (Alessandri & Lewis, 1993). Love, a combination of positive emotions (e.g., joy, interest, contentment) experienced within safe, close relationships (Izard, 1977), broadens by creating recurring urges to explore and enjoy experiences with loved ones. These thought-action tendencies represent ways that positive emotions broaden characteristic manners of thinking or acting (Fredrickson, 1998, 2000). This evidence suggests that positive emotions broaden the scopes of attention, cognition, and action and that they build physical, intellectual, and social resources.

Shared experiences of positive emotions, through smiling, laughter, or social play, for example, causes shared enjoyment in the moment and, possibly, lasting friendships or bonds. A

large body of social psychology research has consistently found that positive affect increases the possibility of altruistic behavior, which, in turn, creates the positive emotion of gratitude in the person who receives help (Isen, 1987). Experiences of gratitude then often create the urge to give back and can cause the beginnings of an ongoing, cooperative relationship (Oatley & Jenkins, 1996). Cooperation and turn-taking are common and critical features of social play, and these practices allow social relationships to form (Boulton & Smith, 1992). Smiling, laughter, and approach, and inhibition are temperamental aspects that are directly related to the social behaviors described.

**Effortful control.** It has been found that effortful control is related to the ability to manage anger with peers (Eisenberg, Fabes, Nyman, Bernzweig, & Pinuelas, 1994), high levels of sympathy and prosocial behavior (Eisenberg, Fabes, & Spinrad, 2006), SC (Eisenberg et al., 1993), and popularity (Eisenberg, Valiente, Fabes, Smith, Reiser, Shepard, & Cumberland..., 2003). The ability to effectively control one's own behavior and attention should allow one the ability to better engage in socially productive interactions with peers, which should, in turn, result in peer likeability.

Rudasill and Konold (2008) investigated the contributions of children's temperament to teachers' ratings of SC from kindergarten through the second grade ( $N=1,364$ ). Temperament was measured by the CBQ, which was completed by mothers when the children were 4.5 years of age, and SC was assessed by the SSRS (Gresham & Elliott, 1990) completed by teachers in kindergarten, first, and second grade. SC was measured using standard scores on the SSRS subscales of cooperation, assertion, and self-control. It was found that attentional focusing and shyness were found to work together to contribute to children's kindergarten scores in one area of SC (assertion). For shyer girls and boys, more attentional focusing contributed to higher

assertion scores in kindergarten, whereas for less shy boys and girls, attentional focusing did not appear to contribute to assertion scores in kindergarten. Also, both facets of effortful control (inhibitory control and attentional focusing) contributed to ratings of SC in that teachers rated children with greater inhibitory control and attentional focusing as more socially competent in cooperation and self-control. Overall, results indicated that attentional focusing and inhibitory control had a statistically significant, though small effect, on children's self-control, cooperation, and assertion in kindergarten, and the patterns of relationships were similar for both boys and girls.

***Gender and rater source.*** Interestingly, effortful control is a dimension of temperament that has yielded significant gender differences (see Else-Quest et al., 2006). Zhang (2011) found that growth in SC was significantly predicted by the interaction between temperamental rhythmicity and gender in Chinese preschoolers and that girls were rated by mothers to have higher levels of SC than boys initially and at the two-year follow-up period.

***Negative affectivity.*** Research has shown that preschoolers considered to be high in SC are rated as having elevated levels of positive affect and relatively low levels of negative affect. Emotion regulation may also lay the foundation for children's relationships and social behavior. Children who are seen to have "difficult" temperaments, or who are high in negative emotionality, are more likely to exhibit aggression and impulsivity, and are, in turn, more likely to be rejected by their peers (Eisenberg, Fabes, Guthrie, & Reiser, 2000). Fabes (2002) indicated that Eisenberg and colleagues have regularly found emotion dysregulation to be a predictor of peer isolation (e.g., Eisenberg, Pidada, & Liew, 2001; Fabes, Hanish, Martin, & Eisenberg, 2002). It has been found that one's ability to regulate and inhibit emotionality is a predictor of peer acceptance and SC as rated by parents, teachers, and peers (Eisenberg, et al., 2001), while

the inability to regulate affect is predictive of socially incompetent behavior (Calkins & Dedmon, 2000). Denham, Blair, DeMulder, Levitas, Sawyer, Auerbach-Major, and Queenan (2003) also found that emotional competence at ages 3 and 4 contributed to SC (as measured by teacher ratings on the SCBE and peer sociometrics) initially at ages 3 to 4 and during follow-up in kindergarten for both boys and girls.

***Gender and rater source.*** It may be that emotional expression contributes to adults' ratings of boys' SC differently from those of girls (Denham, et al., 2003) as the development of SC in boys appears to be particularly sensitive to affectivity and emotional regulation (Eisenberg, Fabes, Guthrie, et al., 1996). Crick, Casas, and Mosher (1997) found that girls' expression of negative affect may be more salient than that of boys because girls are expected to be "nice." Both maternal and teacher reports of emotion regulation are associated with SC (e.g., Eisenberg, Fabes, Murphy, Maszk, Smith, & Karbon, 1995), and some research has indicated that poor emotional regulation and high negative affectivity in preschoolers' is negatively correlated with older children's SC as rated by both parents and teachers (Eisenberg et al., 1995; Eisenberg, Fabes, Murphy, Karbon, Smith, & Maszk, 1996; Eisenberg, Fabes, Guthrie, Murphy, Maszk, Holmgren, & Suh, 1996; Eisenberg, Fabes, Shepard, Murphy, Guthrie, & Jones, 1997). Anger has also been reported to negatively influence SC in preschoolers when measured by peer sociometrics (Denham, McKinley, Couchoud, & Holt, 1990; Denham & McKinley, 1993).

***Extraversion/surgency.*** While effortful control has been found to consistently predict positive social functioning, impulsivity (or undercontrol) is thought to have a negative impact on social development (Eisenberg & Morris, 2002). Difficulty regulating oneself may result in acting out or aggressive behavior, which may be viewed as a lack of socially appropriate

behavior and lower acceptance by peers (Spinrad, Eisenberg, Cumberland, Fabes, Valiente, Shepard, Reiser, Losoya, & Guthrie, 2006).

Social withdrawal and shyness have likewise been found to predict peer rejection and victimization as early as preschool (e.g., Gazelle & Ladd, 2003). Children who are high in shyness demonstrate less socially competent behaviors compared to their nonreticent peers (Rubin & Krasnor, 1992). Sociable children who were high on approach but lacked regulation of their behavior were considered disruptive and aggressive, whereas those who were high on approach but able to regulate their behavior were considered to be socially competent (Rubin, Coplan, Fox, & Calkins, 1995). Therefore, preschoolers who have difficulty regulating responses are more likely to exhibit behaviors that result in peer rejection and prevent quality interactions and relationships (Rubin et al., 1995).

*Gender and rater source.* Gender differences have consistently been found on aspects of extraversion/surgency, such as activity level and impulsivity (see Else-Quest et al., 2006). Several studies have revealed that preschool girls exhibit more traits related to social competency, such as adaptability, flexibility, and low reactivity when rated by both teachers and mothers (Keogh, 2003; Griggs et al., 2009).

Rudasill and Konold (2008) found that children's shyness on the mother-rated CBQ contributed to teacher ratings of SC on the SSRS as measured by cooperation, self-control, and assertion. Teachers rated shyer children higher than less shy children on cooperation and self-control, and they rated less shy children higher than shyer children on assertion, which was true for both boys and girls.

**Conclusions.** Overall, there is a lack of consistent data suggesting significant gender differences in SC and several studies have not reported separate analyses by gender (see

Appendix B). When reviewing the literature on gender and SC, it is also necessary to contemplate the reasons and factors influencing such gender differences. First, the sample composition of raters is a possible source of female-rater gender bias in the ratings of preschoolers' behavior. The majority of preschool and early childhood teachers are female and most SC rating scales tend to draw on teachers as raters. A second source of bias may also be expressed in the development of a classroom environment that is more suitable to girls rather than boys, and it is possible that the preschool setting is less appealing and more restrictive for a higher proportion of boys than girls (Sax, 2001). Thus, it is likely that a higher percentage of boys respond to these classroom conditions with more externalizing and less socially competent behaviors than girls. A higher percentage of disruptive behavior concerns in boys should be anticipated due to gender differences in effortful control, which is a highly demonstrated finding (LaFreniere and Dumas, 1996).

### **Gender Norming on Measures of Social Competence**

Psychological assessment has a long-standing history of using normed scores for demographic variables such as gender and age, which implies that identical raw scores on a measure have different meanings based on one's gender or age. Though standardized scores based on norms outline where one scores relative to the same age or gender, the raw scores indicate one's absolute level of ability, "and it would not be surprising, then, if these two metrics related differently to external measures" (p. 539, Samuel, Ansell, Hopwood, Morey, Markowitz, Skodol, & Grilo, 2010).

Only a few studies have addressed the effects of gender norming, and the ones that surfaced in a review of the literature investigated psychopathology in adults but none specifically addressed SC in preschool-aged children. Samuel and colleagues (2010) indicated that Morey



(1991) recommended against gender norming in the manual for the Personality Assessment Inventory, as it may suggest similarity among groups that have shown differences in large-scale epidemiological studies. The *Schedule of Nonadaptive and Adaptive Personality* (SNAP; Clark, 1993) manual endorsed the use of gender norms but emphasized that “the long-held assumption that gendered norms provide a more valid basis for assessment is being challenged” and wonders whether gender differences result from true differences rather than from differences in expression (p. 58).

Schinka, LaLone, and Greene (1998) called into question the continued use of gender-based norms for the *Minnesota Multiphasic Personality Inventory, Second Edition* (MMPI-2). They found that demographic variables rarely had a strong influence in explaining MMPI-2 scale score variance, except for gender, which was found to influence four scales. They asserted that “gender-based norms may obfuscate gender-psychopathology scale relations that reflect...clinical realities” (p. 209). Samuel and colleagues (2010) found that unisex scores were equally or more valid than gender normed scores on the overall profile of the *NEO Personality Inventory-Revised* (NEO PI-R; Costa & McCrae, 1992) and suggested that gender norms introduced systematic variance to the NEO PI-R. Their results indicated that, although the differences yielded from the use of unisex scores were small, they were meaningful in increasing criterion-related validity.

Sackett and Wilk (1994) noted that personality measures are commonly scored using gender-specific norms, yet they discovered that measures using gender norms in its scoring did not often address the rationale for doing so in the test manuals. They questioned whether an effect size favoring girls indicated that girls truly possess more of a particular feature, whether items on the measure tap the feature more effectively for girls than boys, or whether raters

interpret and respond to the items tapping the feature in a different way for girls than for boys (Sackett & Wilk, 1994). Thus, the questions remains: do gender differences on measures exist due to methods of measurement or do they reflect true differences? Sackett and Wilk (1994) argued that a finding of “systematic underprediction on the basis of...gender would warrant score adjustment” such as that that occurs through standardized scores (p. 947). Recently, the field of personality assessment has shifted toward unisex norms and temperament research almost exclusively uses unisex norms. However, measures of SC, including the SCBE, tend to use gendered norms.

### **Gaps in the Literature and the Proposed Study**

The body of literature reviewed indicates that there is extensive research investigating the constructs of temperament and SC in preschoolers and many of these studies examine gender differences. However, it is apparent from the literature previously cited that several studies overlook gender differences altogether or they simply report descriptive statistics such as means, standard deviations, and ranges that may be used to further analyze differences between boys and girls.

Studies that have investigated gender differences reveal that there are, in fact, differences between boys and girls on many temperament and SC measures, though there are gaps in our understanding of where such differences lie and whether it varies by rater. Standard deviations are routinely reported by gender, but significant differences in variability between groups have not been investigated in any of the reviewed literature. It may be that the standard deviations of each group are similar, but there are questions as to whether the distribution is skewed differently for boys and girls. None of the studies found in the current literature review deconstructed standard deviations and skewness of the distributions so as to understand the potential

distributional differences for boys and girls. One primary purpose of the current work was to add to the literature by investigating where gender differences lie in a distribution and whether it differs by rater source.

Another gap in the current literature is related to the fact that several measures of SC compare gender differences using standardized scores that have been normed separately for each gender. Consequently, raw scores may differ despite similar standard scores and what constitutes average scores may be different for girls and boys. Some studies reviewed above used measures normed separately by gender, while others reported raw scores. Overall, gender differences were more likely to be reported when raw scores were used compared to standardized scores. A key question of the current study was based around the fact that, in those studies reporting gender differences using T-scores on the SCBE, boys are compared to other boys' scores, whereas girls are compared to other girls' scores. The current study aimed to compare raw score data on the SCBE for boys and girls with the corresponding gender-normed T-scores.

A review of the literature reveals numerous correlations between SC and temperament. However, studies used either raw or standard scores, not both. No study found has examined differences in correlations when raw versus standard scores are used and the majority of the studies reported the gender-normed scores. Hence, it was not possible to compare differences in relations with external correlates with raw or standard scores. The proposed study sought to supplement the literature on how gender and rater source influence patterns of temperament relations with SC. Additionally, most studies investigating links between temperament and SC incorporated parent-rated temperament and teacher-rated SC measures. The present study added to the literature by considering both parent- and teacher-rated temperament and its relations to

teacher-rated SC, thus affording the chance to compare gender differences for each informant of temperament and how these relate to ratings of SC.

## **Research Questions and Hypotheses**

Based on the review of the literature, the following research questions and hypotheses were proposed (see Table 4 for the data analysis plan):

**1. Distributional gender differences in temperament within rater.** One of the current study's primary aims was to understand to what extent there are distributional differences between genders regardless of mean differences. Based on previous findings in the temperament literature, it was anticipated that teacher ratings would yield more gender differences on the subscales of effortful control compared to parent ratings (Zhou et al., 2004; Spinrad et al., 2006; Hanish et al., 2004). There were no patterns of findings in the literature review to indicate that gender differences would emerge differently based on rater for subscales falling under the dimensions of extraversion/surgency or negative affectivity.

**1a) Mean differences and variability.** Independent samples *t*-tests were conducted separately for parent and teacher informants on the CBQ and CBQ-T to compare effect sizes of gender differences within rater. Mean gender differences on the CBQ and CBQ-T using raw scores are reported, though predicted mean differences were expected to replicate previous work.

Standard deviations for boys and girls on all fifteen subscales of the CBQ were compared in order to investigate differences in the way parents rate girls versus the way they rate boys. Similarly, standard deviations for boys and girls on all fifteen subscales of the CBQ-T were compared to understand whether teachers rate boys and girls differently. *F*-tests were conducted to compare the variability of boys and girls when rated by parents separately from when they are rated by teachers. The purpose of this analysis was to examine whether ratings of one gender

group was more variable than the other and whether there was a significant difference between the standard deviations of boys and girls when considering raters separately. Based on the literature reviewed, it was hypothesized that parents would rate boys with more variability than girls on subscales of effortful control on the CBQ (Komsis et al., 2006; Olson et al., 2005; Spinrad et al., 2006), and no variability between genders would be found for subscales of effortful control on the CBQ-T with teacher ratings (Spinrad et al., 2006).

*1b) Skewness.* Departures from normality for boys and girls were examined separately on the CBQ for parent raters and on the CBQ-T for teacher raters. Skewness coefficients for boys and girls were informally compared on each temperament variable on the CBQ and separately on the CBQ-T (see Appendix C).

*1c) Locus of gender differences.* The proportion of boys and girls at three different points in the distribution were examined with the purpose of identifying where gender differences lie in the distribution and whether they were located in the middle, upper, or lower bounds.

Based on a frequency analysis, the sample was divided into tertiles for each gender on each of the fifteen variables of temperament. The two extreme groups consisted of those participants who were at least 0.5 standard deviations higher and lower than the mean yielding “upper,” “middle,” and “lower” tertiles, and differences in proportionality between boys and girls in the three intervals were examined for each rater.

A power analysis (with a significance criterion of .05, anticipated effect size of .35 [based on the approximate effect sizes found in the review of the literature], and a desired power level of .80) was conducted in order to ensure that there is sufficient power to analyze only the data points included in the two extreme categories. The analysis indicated that a sample size of  $n=26$

in each subgroup should provide sufficient power (Crocker & Algina, 1986). Chi-square tests were conducted in order to determine whether significant differences exist between the percentage of boys and girls in each of the three groups of the distribution on each variable of temperament for each rater (see Appendix D). However, results were interpreted with caution due to limited power and the distributions will be visually inspected.

It was hypothesized that more boys would fall in the extreme tails of the sample distribution compared to girls on dimensions of temperament whether or not significant mean gender differences exist (Hedges & Friedman, 1993; Feingold, 1992). It may be that the distribution does not differ notably between genders except at the extremes, which would shed light into gender differences and how they are currently perceived. Feingold (1992) suggested the “greater male variability” hypothesis for gender differences in cognitive abilities and asserted that differences in variability must be considered in order to better understand the magnitude of gender differences. However, Else-Quest and colleagues (2006) noted that girls may exhibit greater variability in emotional experiences because some studies have found that girls experience greater negative affect than boys, in addition to greater positive affect (Grossman & Wood, 1993). Therefore, they argued that a “greater female variability” hypothesis may hold true for some variables of temperament.

**2. Distributional gender differences in temperament by rater.** Given that low rater agreement is common (De Los Reyes & Kazdin, 2005), it is important to understand the tendencies of informants and how they may differ for boys and girls. As a result, distributional differences were considered for girls and boys as described in Question 1, but also whether differences were the same for parent and teacher raters. Whereas Question 1 considered gender

differences in each rater separately, Question 2 compared raters (parents and teachers) on differences in girls and boys.

**2a. Mean differences and variability.** Effect sizes were compared between raters after mean differences were computed using paired-samples *t*-tests. *F*-tests were also conducted to compare whether gender differences in variability are the same for parent and teacher ratings. The analyses compared the variability of boys when rated by parents on the CBQ to boys when rated by teachers on the CBQ-T on each of the fifteen scales of temperament. The same analyses were conducted for girls in order to compare rater differences. This question was key in understanding whether parents or teachers rate with a wider distribution and more outliers.

**3. Distributional differences in SC as measured by the SCBE.** Because distributional differences for boys and girls may be obscured by using gender-normed T-scores on the SCBE (LaFreniere & Dumas, 1992), raw scores were examined in order to further dissect distributional differences. It was anticipated that there would be gender differences on the SCBE using raw scores because the scale is normed separately by gender.

**3a) Mean differences and variability.** Effect sizes were compared between genders using both T-scores and raw scores on the SCBE following independent-samples *t*-tests that compared mean differences. Differences in variability between boys and girls were compared by conducting *F*-tests using both raw and standard scores on the eight subscales of the SCBE (Depressive-Joyful, Anxious-Secure, Angry-Tolerant, Isolated-Integrated, Aggressive-Calm, Egotistical-Prosocial, Oppositional-Cooperative, and Dependent-Autonomous) and the Social Competence composite scale, which summarizes forty items from all eight positive poles of the eight subscales (see Chapter 3 for more information about the SCBE scale).

**3b) Skewness.** The skewness coefficients of the T-scores and raw scores on the eight subscales and Social Competence composite scale of the SCBE were compared by gender. The T-scores were hypothesized to fall on the normal curve with little or no skew (see Appendix C).

**3c) Locus of gender differences.** The distribution of raw scores on the eight subscales and the Social Competence composite scale of the SCBE were informally compared between boys and girls. The distribution for each gender's raw scores were visually inspected and compared to the normal curve on which the gender-normed T-scores were expected to lie. The raw scores were then divided into tertiles as outlined in Question 1c, and the proportions of boys and girls in each interval were analyzed.

#### **4. Relations between SC and temperament in boys and girls.**

**4a) Consideration of nested data.** Because preschool teachers rated several children on the CBQ-T and SCBE measures, the percent of variance accounted for by rater was considered. SPSS software does not allow for Intraclass Correlation Coefficients (ICCs) to be conducted with these data, so alternate ways of conducting these analyses were considered. Parameter estimates were computed using HLM 7 (see Appendix E).

**4b) Moderators and interaction effects.** In order to investigate whether patterns of relations between temperament dimensions and social competence for boys and girls were the same for parent and teacher informants and whether patterns differ when raw versus standard scores are used to measure SC, Pearson correlations and linear regression analyses were conducted. Temperament was measured by both parent and teacher ratings on the fifteen scales of the CBQ and CBQ-T. SC was measured by teacher ratings on the overall Social Competence composite scale on the SCBE and both raw and standard scores were considered in the analyses with the goal of understanding whether raw scores yielded different conclusions compared to



standard scores. Correlations were analyzed to measure the relations between temperament and SC as outlined and correlation coefficients were compared with the goal of identifying patterns among constructs, between genders, and between T-scores and raw scores. Based on the resulting patterns, regression analyses were conducted in order to understand the interaction between gender and temperament in the prediction of social competence and moderating effects. A two-way interaction term for gender x temperament (CBQ and CBQ-T) was computed.

It was not possible to hypothesize patterns of outcomes based on the literature because no previous study found has incorporated the use of both raw and standard scores, though it is predicted that some differences will result when comparing standard versus raw scores as the criterion variable. It was also anticipated that more relations will be found between the CBQ-T and SCBE than the CBQ and SCBE because the CBQ-T and SCBE are both teacher-completed measures.

Table 4

*Data Analysis Plan*

Research Question/Purpose	Measures	Analyses
	15 subscales of CBQ	
Descriptive statistics for preliminary analyses	15 subscales of CBQ-T 9 scales of SCBE T-scores 9 scales of SCBE raw scores	<ul style="list-style-type: none"> <li>• Frequencies by gender</li> <li>• Means by gender</li> <li>• SDs by gender</li> <li>• Range by gender</li> </ul>
<b>1. Distributional Gender Differences in Temperament <u>Within Rater</u></b>		
Are there distributional differences between genders regardless of mean differences? Analyses will be conducted separately for parent and teacher informants on the CBQ and CBQ-T to compare gender differences within rater		
1a) Means and Variability		
<ul style="list-style-type: none"> <li>• Means and SDs for boys and girls will be compared to investigate differences in the way parents and teachers rate girls vs. boys</li> </ul>	15 subscales of CBQ  15 subscales of CBQ-T	<ul style="list-style-type: none"> <li>• Independent-samples <i>t</i>-tests to compare gender means; compute effect sizes using Cohen's <i>d</i></li> <li>• <i>F</i>-tests to compare SDs (e.g., Activity Level SDs for boys will be compared to Activity Level SDs for girls for parents, and again, for teachers)</li> </ul>
1b) Skewness		
<ul style="list-style-type: none"> <li>• The distributions and departures from normality for boys and girls will be compared</li> </ul>	15 subscales of CBQ 15 subscales of CBQ-T	<ul style="list-style-type: none"> <li>• Skewness coefficients for boys and girls will be informally compared</li> <li>• Graphically depicted and visually inspected</li> </ul>
1c) Locus of Gender Differences		
<ul style="list-style-type: none"> <li>• The proportion of boys and girls at 3 different points in the distribution will be examined with the purpose of identifying where differences lie in the distribution and whether they are located in the middle, upper or lower bounds</li> </ul>	15 subscales of CBQ  15 subscales of CBQ-T	<ul style="list-style-type: none"> <li>• The sample will be divided into tertiles for each gender on each of the 15 scales of temperament</li> <li>• Proportions of boys and girls in each of the intervals will be compared using chi-square tests</li> </ul>

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## 2. Distributional Gender Differences in Temperament By Rater

Given that low rater agreement is common, it is important to understand the tendencies of informants and how they may differ for boys and girls. Distributional differences will be considered for girls and boys as described in Question #1, but also whether differences are the same for parent and teacher raters. Whereas Question #1 considers gender differences in each rater separately, Question #2 compares raters on differences in girls and boys.

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### 2a) Means and Variability

- Will compare whether gender means and differences in variability are the same for parent and teacher raters

15 subscales of CBQ

15 subscales of CBQ-T

- Paired-samples *t*-tests to compare means by rater; compute effect sizes using Cohen's *d*
  - *F*-tests will compare the variability of boys/girls when rated by parents on the CBQ to boys/girls when rated by teachers on the CBQ-T (e.g., boys' Activity Level SDs on the CBQ compared to boys' Activity Level SDs on the CBQ-T)
- 

## 3. Distributional Differences in SC as Measured by the SCBE

Because distributional differences for boys and girls may be obscured by using gender-normed T-scores on the SCBE, raw scores will be examined to further dissect distributional differences

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### 3a) Means and Variability

- Means and SDs for boys and girls will be compared to investigate gender differences and differences between the use of T-scores and raw scores

T-scores and raw scores for 8 subscales and SC composite scale on the SCBE

- Independent-samples *t*-tests to compare gender means using both T-scores and raw scores; compute effect sizes using Cohen's *d*
  - *F*-tests will compare variability of T-scores and raw scores by gender (e.g., SC raw score for boys compared to SC raw score for girls)
- 

### 3b) Skewness

- The distributions and departures from normality for boys and girls will be compared

T-scores and raw scores for the 8 subscales and SC composite scale on the SCBE

- Skewness coefficients for boys and girls will be informally compared
  - Graphically depicted and visually inspected
- 

### 3c) Locus of Gender Differences

- The distribution of T-scores and raw scores will be compared between boys and girls

T-scores and raw scores for the 8 subscales and SC composite scale on the SCBE

- The sample will be divided into tertiles for each gender on each of the 9 scales of the SCBE
    - Compared to the normal curve on which the gender-normed T-scores are expected to lie
  - Proportions of boys and girls in each of the intervals will be compared using chi-square tests
- 

## 4. Relations between SC and Temperament in Boys and Girls

The purpose is to investigate whether patterns of relations between temperament and SC for boys and girls are the same for informants and if patterns differ when raw vs. standard scores are used

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<p>4a. Consideration of nested data because several children were rated by one teacher</p> <ul style="list-style-type: none"> <li>• What percent of variance is accounted for by rater/teacher?</li> </ul>	<p>15 subscales of CBQ-T</p> <p>T-scores and raw scores for 8 subscales and SC composite scale on the SCBE</p>	<ul style="list-style-type: none"> <li>• Compare children by classrooms with Two-Level Mixed Effects Model <ul style="list-style-type: none"> <li>○ Level 1: Individual child (age centered to remove non-essential multicollinearity)</li> <li>○ Level 2: Classroom</li> <li>○ Criterion Variable: CBQ-T or SCBE scale</li> </ul> </li> </ul>
<p>4b. Will there be differential patterns between parents and teachers and when using raw vs. standard scores for SC?</p> <ul style="list-style-type: none"> <li>• Correlations will be analyzed to measure the relations between temperament and SC</li> <li>• Will there be an interaction between gender and parent/teacher-rated temperament in the prediction of social competence? Moderation?</li> <li>• And will this be the case for both raw and standard scores for SC?</li> </ul>	<p>Temperament: 15 scales of the CBQ and CBQ-T</p> <p>SC: SC composite scale on SCBE</p>	<ul style="list-style-type: none"> <li>• Correlations between 15 subscales on CBQ and CBQ-T and SC summary scale raw and T-score score on SCBE by gender</li> <li>• Correlation coefficients will be compared and inspected for patterns</li> <li>• Linear Regression with SC composite T- or raw score as criterion variable <ul style="list-style-type: none"> <li>○ Model 1: Age, Gender</li> <li>○ Model 2: Age, Gender, CBQ/CBQ-T variable</li> <li>○ Model 3: Age, Gender, CBQ/CBQ-T variable, two-way interaction term (gender x CBQ/CBQ-T variable)</li> </ul> </li> </ul>

## Chapter 3: Methods

### Design

This cross-sectional study investigated the quantitative information collected from the CBQ, CBQ-T, and SCBE. The data collected were part of a larger correlational study. However, since the CBQ, CBQ-T, and SCBE are the only measures used in this study, the method described is limited to the planning, administering, and analysis of the three measures.

### Measures

**CBQ.** Parents (either mother or father) completed the short form of the *Children's Behavior Questionnaire* (CBQ) to assess children's temperament (Putnam & Rothbart, 2006). The 94 items were rated on a 7-point Likert scale ranging from "extremely untrue of your child" to "extremely true of your child." The measure yields 15 subscales that reliably reflect three broad temperament dimensions (Rothbart et al., 2001): negative affectivity (discomfort, sadness, fear, anger–frustration, and soothability [reverse coded]), surgency (impulsivity, high intensity pleasure, activity level, smiling/ laughter, positive anticipation, and shyness [reverse coded]), and effortful control (low intensity pleasure, inhibitory control, perceptual sensitivity, and attentional focusing). Putnam and Rothbart (2006) found four scales, Approach/Positive Anticipation, Inhibitory Control, Fear, and Sadness, to fall below an alpha of .70 with one below .65 (Sadness). For the current sample, alpha coefficients ranged from .61 to .86 (see Teglassi, Schussler, & Gifford, under review).

**CBQ-T.** The *CBQ-Teacher Short Form* (CBQ-T) was constructed based on the short form of the CBQ with permission from its original authors (Putnam & Rothbart, 2006; see Teglassi et al., under review). The new items were kept as close to the original wording as

possible and word changes were made to make the items appropriate to the preschool classroom but without altering the temperament concept measured (a total of 26 altered items). For the current sample, internal consistency values were generally acceptable with an alpha at or above .70 (ranging from .67 to .89), though two scales did not exhibit adequate internal consistency, including Low Intensity Pleasure ( $\alpha=.67$ ) and Sadness ( $\alpha=.68$ ).

**SCBE.** The *Social Competence and Behavior Evaluation* (LaFreniere & Dumas, 1992) is a questionnaire comprised of scales that represent a wide range of behaviors frequently observed in the preschool setting. It is considered to be a unique measure because the measure emphasizes a balance of positive attributes, such as children's adaptation and SC, in addition to negative attributes, such as social, emotional, and behavioral problems (LaFreniere & Dumas, 1995).

The SCBE encompasses eight basic scales each with a positive and negative pole, including: Depressive-Joyful, Anxious-Secure, Angry-Tolerant, Isolated-Integrated, Aggressive-Calm, Egotistical-Prosocial, Oppositional-Cooperative, and Dependent-Autonomous. The first three qualify overall emotional adjustment; the second three scales qualify children's social interactions with peers, and the last two qualify social interactions with adults (LaFreniere & Dumas, 2003). The items are designed to assess anxiety/withdrawal, anger/aggression, and SC, and include both positive and negative statements about a child's behavior and affect in relation to both peers and adults. The anxiety/withdrawal scale contains items that describe anxious, depressed, and dependent behaviors; the anger/aggression scale measures angry, aggressive, and oppositional behaviors; and the SC scale is designed to assess positive qualities in a child's adaptation (LaFreniere, 1990). The eight basic scales fall into four summary scales, including: Social Competence, Internalizing Problems, Externalizing Problems, and General Adaptation. The Social Competence scale summarizes items from the positive poles of the eight subscales

and is designed to assess the positive qualities of a child's adaptation (LaFreniere & Dumas, 2003).

The SCBE is a 6-point Likert rating scale with 80 items on which raters are asked to provide responses ranging from "never" to "always" for each item. In the original validation sample, alpha coefficients for the eight scales were highly consistent ranging from .79 to .91 (LaFreniere & Dumas, 1992). During scoring, raw scores are converted to T-scores using separate normative information for boys and girls. Therefore, children are only compared to children of the same gender in the standardization sample. Lower T-scores indicate more problematic adjustment compared to higher scores, which indicate better adjustment (LaFreniere & Dumas, 2003).

### **Participants**

The participants in this study were the parents (or guardians;  $N=106$ ) and teachers from six different classrooms ( $N=6$ ) housing preschool students ( $N=113$ ; 49% boys, 51% girls) who attended an on-campus preschool at a large university in the Mid-Atlantic region of the United States. All of the families at the preschool were affiliated with the university in some capacity.

The mean age of the preschoolers was 57.27 months, ranging from 38 to 82 months of age. The students made up an ethnically diverse sample, including 46.0% "European-American," 11.5% "African-American," 13.3% "Asian-American," 12.4% "Other," and 16.8% were missing ethnicity data.

The parents of the preschool children were from a mostly middle-class sample, based on their self-reported level of employment. None of the parent participants reported having jobs that would only require a high school level of education, while 24.6% reported having jobs that require a four-year college degree, and 29.6% reported having jobs that require a professional or

graduate level degree. 45.8% of the sample chose not to report this information. Age and ethnicity data were not available for the parents of the participating children.

The teachers were also from a mostly middle-class sample, based on the four-year college degree requirement to become a preschool teacher at the school in which data were collected. Based on observation, 86 percent of the teachers were European-American and 100 percent were female. Data were not available for the ages of the teachers.

### **Procedure**

Much of the data included in this study is archival as it was collected and entered beginning in 2006. First, the researchers discussed the objectives of this research with preschool staff and parents at “Back to School Night.” The researchers then disseminated an informational letter and consent forms to parents of children in the relevant age range. Families were given several opportunities over the course of data collection to participate in the study. The only basis for selection into this study was the age of the child and whether parental permission was granted.

An additional informational cover letter and informed consent form describing the study were distributed to the parents of the participating preschoolers. Signed consent forms from the parents or caregivers signified informed consent on behalf of the child, though each child participant is given the opportunity to refuse participation when asked to complete tasks for the study.

A team of seven data collectors were assigned to a classroom and particular children who were participating in the study. Each data collector was trained in the data-collection protocol.

Packets containing the CBQ-T for children with parent or caregiver consent were placed in teacher mailboxes to be completed and returned. Packets containing the CBQ for parents and



caregivers who gave consent also were placed in their child's mailbox to be completed and returned. Researchers followed-up with parents and teachers to collect the completed packet and the packets were checked for missing items and redistributed if necessary.

All materials and data collected were confidential and stored in locked file cabinets in the office of Dr. Hedwig Teglassi on campus at the University of Maryland. Only the research team had access to the materials and all names were removed from the data collected. There was a file folder for each child in which all data for that child was kept, and each child (including the corresponding parent and teacher) was assigned a participant number. A master sheet of names corresponding with participant number was kept in a locked file drawer in the same office. Data entry took place on a secure computer and each child was only identified by participant number. All data was double entered to ensure accuracy.

## Chapter 4: Results

### Gender Differences in Temperament Within Rater

Analyses were conducted separately for parent and teacher informants on the CBQ and CBQ-T to compare gender differences within rater.

**Gender differences in means and variability.** The means, standard deviations, minimum and maximum values, and ranges were calculated by gender for the CBQ and CBQ-T and are displayed in Tables 5 and 6. Tables 5 and 6 also present significance of mean differences and effect sizes using Cohen's  $d$ , in addition to significance of differences between standard deviations using the  $F$ -test. Positive values of  $d$  represent higher scores for boys than girls, whereas negative values represent higher scores for girls. Cohen (1988) provided guidelines for the interpretation of effect sizes and effect sizes of  $d = 0.20$ ,  $0.50$ , and  $0.80$  are considered small, medium, and large, respectively. Tables 7 and 8 present the results of the independent samples  $t$ -tests of each of the CBQ and CBQ-T scales grouped by gender.

**CBQ.** For parent ratings on the CBQ, results of the independent samples  $t$ -tests showed that means significantly differed on two scales. Means differed between boys ( $M = 4.99(.81)$ ,  $n = 48$ ) and girls ( $M = 4.62(.85)$ ,  $n = 57$ ) at the .05 level of significance ( $t(103) = 2.25$ ,  $p < .05$ , 95% CI = .04 to .69) for Activity Level with a small effect size ( $d = .44$ ) and boys rated higher. Girls ( $M = 4.20(1.28)$ ,  $n = 56$ ) and boys ( $M = 3.64(1.33)$ ,  $n = 48$ ) also differed significantly on Discomfort ( $t(102) = -2.17$ ,  $p < .05$ , 95% CI = -1.07 to -.05) with a small effect size ( $d = -.43$ ) and girls rated higher. The scales of High Intensity Pleasure (boys  $M = 5.01(.98)$ ; girls  $M = 4.75(1.07)$ ;  $t(102) = 1.28$ ,  $p > .05$ , 95% CI = .14 to .66;  $d = .25$ ) and Impulsivity (boys  $M = 4.15(1.11)$ ; girls  $M = 3.83(.96)$ ;  $t(103) = 1.54$ ,  $p > .05$ , 95% CI = -.09 to .71;  $d = .30$ ) were

approaching significance for mean differences with small effect sizes, both with boys rated higher.

**CBQ-T.** For teacher ratings on the CBQ-T, 7 scales yielded significant mean differences. Three of these were significantly higher for boys with moderate to large effect sizes, including Activity Level (boys  $M = 4.61(1.40)$ ; girls  $M = 3.73(1.18)$ ;  $t(126) = 3.85$ ,  $p < .01$ , 95% CI = .43 to 1.34;  $d = .68$ .) and High Intensity Pleasure (boys  $M = 4.73(1.34)$ ; girls  $M = 3.77(1.05)$ ;  $t(126) = 4.50$ ,  $p < .01$ , 95% CI = .54 to 1.38;  $d = .80$ ), and Impulsivity with a small effect size (boys  $M = 4.21(1.32)$ ; girls  $M = 3.78(1.05)$ ;  $t(126) = 2.01$ ,  $p < .05$ , 95% CI = .01 to .84;  $d = .36$ ). Three scales were significantly higher for girls with moderate effect sizes, including Inhibitory Control (boys  $M = 4.48(1.24)$ ; girls  $M = 5.05(.91)$ ;  $t(126) = -2.95$ ,  $p < .01$ , 95% CI = -.95 to -.19;  $d = -.52$ .), Low Intensity Pleasure (boys  $M = 4.66(.76)$ ; girls  $M = 5.20(.71)$ ;  $t(126) = -4.20$ ,  $p < .01$ , 95% CI = -.80 to -.29;  $d = -.75$ ), and Perceptual Sensitivity (boys  $M = 4.77(.83)$ ; girls  $M = 5.30(.72)$ ;  $t(126) = -3.87$ ,  $p < .01$ , 95% CI = -.80 to -.26;  $d = -.68$ ). Fear also yielded a significant mean difference with girls being rated higher, though with a smaller effect size (boys  $M = 3.63(.67)$ ; girls  $M = 3.92(.85)$ ;  $t(126) = -2.19$ ,  $p < .05$ , 95% CI = -.56 to -.03;  $d = -.38$ ).

Overall, more gender differences were unique for teacher raters, especially on scales that are typically associated with girls being higher. Also, there was similarity across raters on scales that are typically associated with boys being higher, but larger effect sizes and more significant differences were found for teacher compared to parent raters.

For both parent and teacher ratings, boys were rated higher on Activity Level, though with a larger effect size for teacher raters. Other temperament scales that are typically rated higher for boys, such as High Intensity Pleasure and Impulsivity, were found to be higher for boys in the current study, though they were only approaching significance for parent raters and

were significant with large and small effect sizes, respectively, for teacher raters. For parents, girls were only found to be rated significantly higher on Discomfort, whereas teachers rated girls significantly higher with moderate effect sizes on Inhibitory Control, Low Intensity Pleasure, and Perceptual Sensitivity, and with a small effect size on Fear.

*F-tests to compare standard deviations.* On the CBQ, both boys and girls showed the largest range of scores on the variable of Shyness (boys range = 5.83; girls range = 5.17), though the range was larger for boys compared to girls. Anger/Frustration also showed a large range for both genders (boys range = 5.17; girls range = 5.17). Low Intensity Pleasure (boys range = 3.00; girls range = 2.63) and Smiling/Laughter (boys range = 3.00; girls range = 2.17) had the smallest range of scores for boys and girls. Overall, 9 variables had wider ranges for boys and 6 had wider ranges for girls. Significant differences between standard deviations for boys and girls were compared using the *F*-test to investigate differences in the variability with which parents rate girls versus boys and the way teachers rate girls versus boys (Tables 4 and 5). Two out of 15 scales, including Falling Reactivity/Soothability (boys *SD* = 1.22; girls *SD* = .89;  $p < .01$ ) and Perceptual Sensitivity (boys *SD* = .97; girls *SD* = .77;  $p < .05$ ) yielded significant variability in standard deviations for parent ratings with ratings for boys being more variable than for girls.

On the CBQ-T, boys showed the largest range of scores on the variable of Shyness (boys range = 6.00) and the smallest range of scores on Fear (boys range = 3.17). Activity Level (girls range = 5.71) yielded the largest range for girls and Low Intensity Pleasure yielded the smallest (girls range = 2.75). Overall, 9 variables had wider ranges for boys and 6 had wider ranges for girls. Four of 15 variables were significantly variable for teacher ratings. Boys had more variability on three of the scales including, including High Intensity Pleasure (boys *SD* = 1.34; girls *SD* = 1.05;  $p < .05$ ), Impulsivity (boys *SD* = 1.32; girls *SD* = 1.05;  $p < .05$ ), and Inhibitory

Control (boys  $SD = 1.24$ ; girls  $SD = .91$ ;  $p < .01$ ), whereas girls were rated to be more variable on one scale, Fear (boys  $SD = .67$ ; girls  $SD = .85$ ;  $p < .05$ ).

Overall,  $F$ -tests revealed that boys were more likely to be rated with more variability compared to girls for both parent and teacher raters. However, the scales that produced the most variability for parent raters were scales that are typically more associated with girls (i.e., Falling Reactivity/Soothability, Perceptual Sensitivity), though for teacher raters the scales with the most variability are typically associated with boys (i.e., High Intensity Pleasure, Impulsivity, Inhibitory Control). Only one scale was found to yield more variability for girls, which was Fear by teacher raters. Girls were not rated with significantly more variability by parents on any of the temperament scales.

Table 5

*Descriptive Statistics for Boys (N=48) and Girls (N=57) on the CBQ*

Scale	<i>M (SD)</i>	Min.-Max.	Range	Cohen's <i>d</i>	<i>F</i> -Test <i>p</i> -value
Activity Level					
Boys	4.99 (.81)	3.14-7.00	3.86		
Girls	4.62 (.85)	2.43-6.86	4.43	.44*	.40
Anger/Frustration					
Boys	4.18 (1.20)	1.50-6.67	5.17		
Girls	4.25 (1.12)	1.50-6.67	5.17	-.06	.31
Approach/Positive Anticipation					
Boys	5.07 (.83)	3.50-6.67	3.17		
Girls	5.20 (.82)	2.33-6.83	4.50	-.15	.45
Attentional Focusing					
Boys	5.31 (.92)	2.50-6.83	4.33		
Girls	5.13 (1.05)	2.33-7.00	4.67	.19	.18
Discomfort					
Boys	3.64 (1.33)	1.17-6.50	5.33		
Girls	4.20 (1.28)	2.17-6.83	4.67	-.43*	.39
Falling Reactivity/Soothability					
Boys	4.84 (1.22)	2.00-6.50	4.50		
Girls	4.98 (.89)	2.83-6.83	4.00	-.14	.01**
Fear					
Boys	4.07 (1.17)	1.83-6.67	4.83		
Girls	4.12 (1.09)	2.00-6.33	4.33	-.04	.31
High Intensity Pleasure					
Boys	5.01 (.98)	2.67-7.00	4.33		
Girls	4.75 (1.07)	2.50-6.83	4.33	.25	.27
Impulsivity					
Boys	4.15 (1.11)	1.33-6.17	4.83		
Girls	3.83 (.96)	2.17-6.67	4.50	.30	.15
Inhibitory Control					
Boys	4.90 (.91)	1.83-6.33	4.50		
Girls	4.92 (.77)	2.50-6.17	3.67	-.02	.11
Low Intensity Pleasure					
Boys	5.83 (.69)	4.00-7.00	3.00		
Girls	5.93 (.57)	4.38-7.00	2.63	-.17	.08
Perceptual Sensitivity					
Boys	5.46 (.97)	2.83-6.83	4.00		
Girls	5.62 (.77)	3.50-6.67	3.17	-.19	.05*
Sadness					
Boys	4.24 (.89)	2.29-5.71	3.43		
Girls	4.24 (.92)	2.57-6.14	3.57	.00	.42
Shyness					
Boys	3.53 (1.44)	1.00-6.83	5.83		
Girls	3.68 (1.18)	1.17-6.33	5.17	-.12	.08
Smiling & Laughter					
Boys	5.92 (.70)	4.00-7.00	3.00		
Girls	6.02 (.57)	4.83-7.00	2.17	-.16	.07

\* $p < .05$ . \*\* $p < .01$ .Cohen's *d* is positive when higher for boys and negative when higher for girls.

Table 6

*Descriptive Statistics for Boys (N=65) and Girls (N=63) on the CBQ-T*

Scale	<i>M (SD)</i>	Min.-Max.	Range	Cohen's <i>d</i>	<i>F-Test p-value</i>
Activity Level					
Boys	4.61 (1.40)	1.29-6.86	5.57		
Girls	3.73 (1.18)	1.29-7.00	5.71	.68**	.09
Anger/Frustration					
Boys	3.52 (1.31)	1.17-6.17	5.00		
Girls	3.21 (1.37)	1.00-6.50	5.50	.23	.37
Approach/Positive Anticipation					
Boys	4.61 (1.02)	1.50-7.00	5.50		
Girls	4.48 (.88)	2.67-6.67	4.00	.13	.12
Attentional Focusing					
Boys	4.96 (1.06)	2.33-7.00	4.67		
Girls	5.29 (1.00)	2.33-6.83	4.50	-.33	.33
Discomfort					
Boys	3.55 (1.20)	1.50-7.00	5.50		
Girls	3.83 (1.14)	1.83-6.17	4.33	-.24	.34
Falling Reactivity/Soothability					
Boys	4.42 (1.04)	2.00-6.17	4.17		
Girls	4.73 (1.20)	1.33-7.00	5.67	-.28	.13
Fear					
Boys	3.63 (.67)	2.33-5.50	3.17		
Girls	3.92 (.85)	1.83-6.67	4.83	-.38*	.03*
High Intensity Pleasure					
Boys	4.73 (1.34)	1.50-7.00	5.50		
Girls	3.77 (1.05)	1.50-7.00	5.50	.80**	.03*
Impulsivity					
Boys	4.21 (1.32)	1.33-6.67	5.33		
Girls	3.78 (1.05)	1.00-6.67	5.67	.36*	.04*
Inhibitory Control					
Boys	4.48 (1.24)	1.17-6.50	5.33		
Girls	5.05 (.91)	2.83-6.50	3.67	-.52**	.01**
Low Intensity Pleasure					
Boys	4.66 (.76)	3.00-6.50	3.50		
Girls	5.20 (.71)	3.63-6.38	2.75	-.75**	.29
Perceptual Sensitivity					
Boys	4.77 (.83)	2.50-6.50	4.00		
Girls	5.30 (.72)	2.83-6.67	3.83	-.68**	.13
Sadness					
Boys	3.81 (.92)	2.00-7.00	5.00		
Girls	3.96 (.83)	2.43-5.86	3.43	-.17	.21
Shyness					
Boys	3.67 (1.30)	1.00-7.00	6.00		
Girls	3.67 (1.30)	1.00-6.50	5.50	.00	.50
Smiling & Laughter					
Boys	5.27 (1.11)	2.83-7.00	4.17		
Girls	5.62 (.98)	3.00-7.00	4.00	-.33	.17

\* $p < .05$ . \*\* $p < .01$ .Cohen's *d* is positive when higher for boys and negative when higher for girls.

Table 7

*Results of t-tests for CBQ Variables by Gender*

Scale	Group				95% CI for Mean Difference	<i>t</i>	<i>df</i>
	Boys		Girls				
	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>			
Activity Level	4.99 (.81)	48	4.62 (.85)	57	.04, .69	2.25*	103
Anger/Frustration	4.18 (1.20)	48	4.25 (1.12)	57	-.52, .38	-.31	103
Approach/Positive Anticipation	5.07 (.83)	48	5.20 (.82)	57	-.45, .19	-.78	103
Attentional Focusing	5.31 (.92)	48	5.13 (1.05)	57	-.20, .57	.96	103
Discomfort	3.64 (1.33)	48	4.20 (1.28)	56	-1.07, -.05	-2.17*	102
Falling Reactivity/Soothability	4.84 (1.22)	48	4.98 (.89)	57	-.55, .27	-.70	103
Fear	4.07 (1.17)	48	4.12 (1.09)	57	-.48, .39	-.21	103
High Intensity Pleasure	5.01 (.98)	48	4.75 (1.07)	56	-.14, .66	1.28	102
Impulsivity	4.15 (1.11)	48	3.83 (.96)	57	-.09, .71	1.54	103
Inhibitory Control	4.90 (.911)	48	4.92 (.77)	57	-.35, .30	-.12	103
Low Intensity Pleasure	5.83 (.69)	48	5.93 (.57)	57	-.35, .14	-.85	103
Perceptual Sensitivity	5.46 (.97)	48	5.62 (.77)	57	-.50, .18	-.94	103
Sadness	4.24 (.89)	47	4.24 (.92)	57	-.36, .35	-.01	103
Shyness	3.53 (1.44)	48	3.68 (1.18)	57	-.66, .36	-.59	102
Smiling & Laughter	5.92 (.70)	48	6.02 (.57)	57	-.35, .15	-.81	103

\* $p < .05$ . \*\* $p < .01$ .



Table 8

*Results of t-tests for CBQ-T Variables by Gender*

Scale	Group				95% CI for Mean Difference	<i>t</i>	<i>df</i>
	Boys		Girls				
	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>			
Activity Level	4.61 (1.40)	65	3.73 (1.18)	63	.43, 1.34	3.85**	126
Anger/Frustration	3.52 (1.31)	65	3.21 (1.37)	63	-.16, .78	1.29	126
Approach/Positive Anticipation	4.61 (1.02)	65	4.48 (.88)	63	-.21, .46	.73	126
Attentional Focusing	4.96 (1.06)	64	5.29 (1.00)	62	-.70, .03	-1.82	124
Discomfort	3.55 (1.20)	65	3.83 (1.14)	63	-.69, .13	-1.36	126
Falling Reactivity/Soothability	4.42 (1.04)	65	4.73 (1.20)	63	-.70, .08	-1.56	126
Fear	3.63 (.67)	65	3.92 (.85)	63	-.56, -.03	-2.19*	126
High Intensity Pleasure	4.73 (1.34)	65	3.77 (1.05)	63	.54, 1.38	4.50**	126
Impulsivity	4.21 (1.32)	65	3.78 (1.05)	63	.01, .84	2.01*	126
Inhibitory Control	4.48 (1.24)	65	5.05 (.91)	63	-.95, -.19	-2.95**	126
Low Intensity Pleasure	4.66 (.76)	65	5.20 (.71)	63	-.80, -.29	-4.20**	126
Perceptual Sensitivity	4.77 (.83)	65	5.30 (.72)	63	-.80, -.26	-3.87**	126
Sadness	3.81 (.92)	65	3.96 (.83)	63	-.46, .16	-.98	126
Shyness	3.67 (1.30)	65	3.67 (1.30)	63	-.46, .45	-.00	126
Smiling & Laughter	5.27 (1.11)	65	5.62 (.98)	63	-.71, .02	-1.86	126

\* $p < .05$ . \*\* $p < .01$ .

**Chi-square tests to identify locus of gender differences.** The proportion of boys and girls at three different points in each CBQ and CBQ-T scale's distribution were examined with the purpose of identifying where differences lie in the distribution and whether they are located in the middle, upper, or lower bounds. Chi-square tests were conducted to determine whether proportions significantly differed between the three tertiles and are presented in Tables 9 and 10. Follow-up tests (see Appendix D) were conducted to compare differences between two tertiles in all possible combinations (e.g., compared Tertiles 1 to 2, 2 to 3, and 1 to 3).

When rated by parents on the CBQ, significant differences in the distribution were only found on one scale (Table 9). Boys and girls were distributed differently on the scale of Impulsivity ( $\chi^2(2, N=105) = 6.06, p < .05$ ) with a significantly larger proportion of girls falling in the lower tertile (boys = 25%, girls = 44%) compared to a larger proportion of boys in the upper tertile (boys = 48%, girls = 26%). Boys and girls fell similarly around the mean (boys = 27%, girls = 30%) and there was no significant difference between the middle and either of the extreme tertiles.

On the CBQ-T, boys and girls were found to be distributed differently on six scales (Table 9). On Activity Level ( $\chi^2(2, N=128) = 17.06, p < .01$ ), significantly more girls fell in the lower (boys = 23%, girls = 41%) tertile compared to boys in the upper (boys = 52%, girls = 18%) tertile. A significantly larger proportion of girls also fell in the middle (boys = 25%, girls = 41%) tertile compared to the proportion of boys in the upper (boys = 52%, girls = 18%) tertile. On Attentional Focusing ( $\chi^2(2, N=128) = 6.07, p < .05$ ), proportionately more boys fell in the lower (boys = 39%, girls = 27%) tertile compared to the upper (boys = 20%, girls = 40%) tertile. On High Intensity Pleasure, ( $\chi^2(2, N=128) = 22.29, p < .01$ ), proportionately more girls fell in the lower (boys = 23%, girls = 46%) tertile compared to boys in the upper (boys = 54%, girls =

14%) tertile. A larger proportion of girls also fell in the middle (boys = 23%, girls = 40%) tertile compared to the proportion of boys in the upper (boys 54%, girls = 14%) tertile. On Impulsivity, ( $\chi^2(2, N=128) = 7.31, p < .05$ ), a larger proportion of girls fell in both the lower (boys =26%, girls = 40%) and middle (boys = 29%, girls = 38%) tertiles compared to the proportion of boys in the upper tertile (boys = 45%, girls = 22%). On Low Intensity Pleasure, ( $\chi^2(2, N=128) = 16.72, p < .01$ ), there was a significant difference in the proportion of girls in the lower (boys = 46%, girls = 16%) tertile compared to both the middle (boys = 34%, girls = 37%) and upper (boys = 24%, girls = 48%) tertiles. On Perceptual Sensitivity, ( $\chi^2(2, N=128) = 15.73, p < .01$ ), there was a significantly different proportion of boys in the lower (boys = 49%, girls = 21%) compared to the upper tertile (boys = 19%, girls = 48%), and girls in the middle (boys = 32%, girls = 32%) compared to the upper tertile (boys = 19%, girls = 48%).

In brief, out of 45 comparisons for parent raters, there was one significant difference found when comparing tertiles and it was between the two extreme tertiles. Out of 45 comparisons for teacher raters, there were 12 significant differences found when comparing tertiles with 6 of them pertaining to the middle and extreme tertiles, and 6 of them pertaining to the proportions in the extreme tertiles (see Appendix D). Overall, teacher ratings on the CBQ-T yielded more gender differences in the extremes of the distribution compared to parent ratings on the CBQ, as hypothesized.

The largest differences were found at the extremes on several scales. On Impulsivity for parent raters, the largest difference was found at the extremes between the lower and upper tertiles for boys. On Activity Level, High Intensity Pleasure, and Impulsivity for teacher ratings, the largest differences were found at the extremes with significant differences in boys in the upper tertile compared to boys in the lower tertile. For Attentional Focusing, Low Intensity

Pleasure, and Perceptual Sensitivity, the largest differences fell between the lower (more boys) and upper tertiles.

When considering within tertile differences for teacher ratings, boys and girls fell similarly in the middle tertiles on Low Intensity Pleasure and Perceptual Sensitivity. Notable differences were found within the middle tertile when comparing boys and girls on the scales of Activity Level and High Intensity Pleasure with more girls than boys falling around the mean. On traits that are typically associated with boys, a larger proportion of boys fell in the upper tertile compared to girls (i.e., Activity Level, High Intensity Pleasure, and Impulsivity), whereas proportionately more girls fell in the lower tertile compared to boys on typically female traits (i.e., Attentional Focusing, Low Intensity Pleasure, and Perceptual Sensitivity). However, for these typically female traits with more girls in the lower tertile, there were similar proportions of girls and boys in the middle tertile.

Fear and Inhibitory control were approaching significance ( $p = .07, .08$ , respectively) with boys and girls distributed similarly around the mean, a larger proportion of boys in the lower tertile and girls in the upper tertile.

Table 9

*Chi-Square Analyses Comparing the Proportion of Boys and Girls in Tertiles on CBQ Scales*

	Tertile 1		Tertile 2		Tertile 3		$\chi^2$	df	p-value
	(Below the Mean)		(Around the Mean)		(Above the Mean)				
	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)			
Activity Level	12(25)	24(42)	18(38)	16(28)	18(38)	17(30)	3.40	2	.18
Anger/Frustration	17(35)	18(32)	15(31)	19(33)	16(33)	20(35)	.17	2	.92
Approach/Positive Anticipation	19(40)	18(32)	15(31)	22(39)	14(29)	17(30)	.88	2	.65
Attentional Focusing	13(27)	21(37)	15(31)	20(35)	20(42)	16(28)	2.29	2	.32
Discomfort	20(42)	17(30)	19(40)	18(32)	9(19)	21(38)	4.48	2	.11
Falling Reactivity/ Soothability	17(35)	19(33)	11(23)	20(35)	20(42)	18(32)	2.07	2	.36
Fear	16(33)	18(32)	18(38)	19(33)	14(29)	20(35)	.44	2	.80
High Intensity Pleasure	9(19)	21(38)	23(48)	18(32)	16(33)	17(30)	4.85	2	.09
Impulsivity	12(25)	25(44)	13(27)	17(30)	23(48)	15(26)	6.06	2	.05*
Inhibitory Control	19(40)	17(30)	12(25)	18(32)	17(35)	22(39)	1.19	2	.55
Low Intensity Pleasure	19(40)	18(32)	14(29)	18(32)	15(31)	21(37)	.76	2	.68
Perceptual Sensitivity	19(40)	19(33)	13(27)	20(35)	16(33)	18(32)	.84	2	.66
Sadness	16(34)	19(33)	13(28)	20(35)	18(38)	18(32)	.79	2	.67
Shyness	20(42)	16(28)	12(25)	21(37)	16(33)	20(35)	2.59	2	.27
Smiling & Laughter	16(33)	19(33)	14(29)	18(32)	18(38)	20(35)	.09	2	.96

\* $p < .05$ . \*\* $p < .01$ .

Note. % indicates percentage of each gender group.

Table 10

*Chi-Square Analyses Comparing the Proportion of Boys and Girls in Tertiles on CBQ-T Scales*

	Tertile 1 (Below the Mean)		Tertile 2 (Around the Mean)		Tertile 3 (Above the Mean)		$\chi^2$	df	p-value
	Boys n	Girls n	Boys n	Girls n	Boys n	Girls n			
	(%)	(%)	(%)	(%)	(%)	(%)			
Activity Level	15(23)	26(41)	16(25)	26(41)	34(52)	11(18)	17.06	2	.00**
Anger/Frustration	17(26)	26(41)	23(35)	19(30)	25(39)	18(29)	3.37	2	.19
Approach/Positive Anticipation	18(28)	27(43)	23(35)	17(27)	24(37)	19(30)	3.25	2	.20
Attentional Focusing	25(39)	17(27)	26(41)	20(32)	13(20)	25(40)	6.07	2	.05*
Discomfort	25(39)	19(30)	23(35)	19(30)	17(26)	25(40)	2.69	2	.26
Falling Reactivity/ Soothability	25(39)	19(30)	22(34)	19(30)	18(28)	25(40)	2.15	2	.34
Fear	26(40)	15(24)	23(35)	22(35)	16(25)	26(41)	5.32	2	.07
High Intensity Pleasure	15(23)	29(46)	15(23)	25(40)	35(54)	9(14)	22.29	2	.00**
Impulsivity	17(26)	25(40)	19(29)	24(38)	29(45)	14(22)	7.31	2	.03*
Inhibitory Control	27(42)	15(24)	22(34)	24(38)	16(25)	24(38)	5.09	2	.08
Low Intensity Pleasure	30(46)	10(16)	22(34)	23(37)	13(20)	30(48)	16.72	2	.00**
Perceptual Sensitivity	32(49)	13(21)	21(32)	20(32)	12(19)	30(48)	15.73	2	.00**
Sadness	23(35)	19(30)	21(32)	21(33)	21(32)	23(37)	.44	2	.80
Shyness	20(31)	20(32)	23(35)	22(35)	22(34)	21(33)	.01	2	.99
Smiling & Laughter	23(35)	16(25)	26(40)	23(37)	16(25)	24(38)	3.01	2	.22

\* $p < .05$ . \*\* $p < .01$ .

Note. % indicates percentage of each gender group.

## Gender Differences in Temperament By Rater

Analyses were conducted separately for parent and teacher informants on the CBQ and CBQ-T to compare raters on differences in girls and boys.

**Gender differences in means and variability.** The means, standard deviations, minimum and maximum values, and ranges were calculated to compare boys on the CBQ to boys on the CBQ-T, in addition to girls on the CBQ to girls on the CBQ-T (Tables 11 and 12). Tables 11 and 12 also present significance of mean differences and effect sizes using Cohen's  $d$ , in addition to significance of differences between standard deviations using the  $F$ -test. Positive values of  $d$  represent higher parent scores than teachers, whereas negative values represent higher teacher scores. Tables 13 and 14 present the results of the paired samples  $t$ -tests for each gender comparing scores on the CBQ and CBQ-T.

**Boys.** For boys, 7 of 15 scales yielded significant mean differences, all of which were higher for parent raters compared to teachers. Results of the paired samples  $t$ -tests indicated significant differences with small effect sizes on Falling Reactivity/Soothability (CBQ  $M = 4.84(1.22)$ ; CBQ-T  $M = 4.42(1.04)$ ;  $t(44) = 2.23$ ,  $p < .05$ , 95% CI = .05 to 1.00;  $d = .37$ ), Fear (CBQ  $M = 4.07(1.17)$ ; CBQ-T  $M = 3.63(.67)$ ;  $t(44) = -2.19$ ,  $p < .05$ , 95% CI = -.76 to -.03;  $d = .46$ ), Inhibitory Control (CBQ  $M = 4.90(.91)$ ; CBQ-T  $M = 4.48(1.24)$ ;  $t(44) = 2.10$ ,  $p < .05$ , 95% CI = .02 to .81;  $d = .39$ ), and Sadness (CBQ  $M = 4.24(.89)$ ; CBQ-T  $M = 3.81(.92)$ ;  $t(44) = -2.21$ ,  $p < .05$ , 95% CI = -.76 to -.03;  $d = .48$ ). Significant mean differences with moderate to substantially large effect sizes were found on the scales of Low Intensity Pleasure (CBQ  $M = 5.83(.69)$ ; CBQ-T  $M = 4.66(.76)$ ;  $t(44) = -9.15$ ,  $p < .01$ , 95% CI = -1.52 to -.97;  $d = 1.61$ ), Perceptual Sensitivity (CBQ  $M = 5.46(.97)$ ; CBQ-T  $M = 4.77(.83)$ ;  $t(44) = 3.44$ ,  $p < .01$ , 95% CI

= .25 to .96;  $d = .76$ ), and Smiling/Laughter (CBQ  $M = 5.92(.70)$ ; CBQ-T  $M = 5.27(1.11)$ ;  $t(44) = -3.35$ ,  $p < .01$ , 95% CI = -1.06 to -.26;  $d = .70$ ).

**Girls.** For girls, 6 of 15 scales yielded significant mean differences, all of which were higher for parent raters compared to teachers. Results of the paired samples  $t$ -tests indicated significant differences with large effect sizes on the scales of Activity Level (CBQ  $M = 4.62(.85)$ ; CBQ-T  $M = 3.73(1.18)$ ;  $t(49) = 5.08$ ,  $p < .01$ , 95% CI = .54 to 1.25;  $d = .87$ ), Anger/Frustration (CBQ  $M = 4.25(1.12)$ ; CBQ-T  $M = 3.21(1.37)$ ;  $t(49) = 4.28$ ,  $p < .05$ , 95% CI = .49 to 1.37;  $d = .83$ ), Approach/Positive Anticipation (CBQ  $M = 5.20(.82)$ ; CBQ-T  $M = 4.48(.88)$ ;  $t(49) = -4.65$ ,  $p < .05$ , 95% CI = -1.02 to -.40;  $d = .85$ ), High Intensity Pleasure (CBQ  $M = 4.75(1.07)$ ; CBQ-T  $M = 3.77(1.05)$ ;  $t(48) = 6.15$ ,  $p < .01$ , 95% CI = .72 to 1.42;  $d = .92$ ), and Low Intensity Pleasure (CBQ  $M = 5.93(.57)$ ; CBQ-T  $M = 5.20(.71)$ ;  $t(49) = -5.57$ ,  $p < .01$ , 95% CI = -.98 to -.46;  $d = 1.13$ ). Smiling/Laughter also yielded significant mean differences, though with a moderate effect size (CBQ  $M = 6.02(.57)$ ; CBQ-T  $M = 5.62(.98)$ ;  $t(49) = -3.24$ ,  $p < .05$ , 95% CI = -.75 to -.18;  $d = .50$ ).

Overall, boys' scores yielded 7 significant differences between parent and teacher ratings, and girls yielded 6 significant differences, all of which were higher for parents. Though several scales were found to have unique rater differences for each gender, boys and girls both received significantly higher ratings on Low Intensity Pleasure and Smiling/Laughter by parents compared to teachers.

For boys, Low Intensity Pleasure and Perceptual Sensitivity yielded quite large and moderate effect sizes, respectively, and are typically associated with girls being rated higher. However, on these two scales, teachers tended to rate boys closer to the mean and parents tended



to rate boys more extremely. Smiling/Laughter also yielded a moderate effect size with parents rating boys more in the extreme compared to teachers who rated boys closer to the mean.

For girls, large effect sizes were found on scales typically associated with boys being rated higher, including Activity Level and High Intensity Pleasure with parents rating girls higher than teachers. Low Intensity Pleasure, commonly seen as a female temperamental trait, was rated significantly higher for parents than teachers.

***F*-tests to compare SDs.** Significant differences between standard deviations were compared using the *F*-test to investigate differences in the variability with which girls are rated by parents versus teachers and the manner in which boys are rated by parents versus teachers (Tables 11 and 12).

For boys, both parent and teacher ratings yielded the largest range of scores on the variable of Shyness (CBQ range = 5.83; CBQ-T range = 6.00) with teacher ratings largest in range. The scale of Fear produced the smallest range of scores for boys when rated by teachers (CBQ-T range = 3.17), whereas Low Intensity Pleasure (CBQ range = 3.00) and Smiling/Laughter (CBQ range = 3.00) resulted in the smallest range of scores for boys when rated by parents. Four of 15 scales yielded significant variability in standard deviations between raters, including Activity Level (CBQ *SD* = .81; CBQ-T *SD* = 1.40;  $p < .01$ ), Fear (CBQ *SD* = 1.17; CBQ-T *SD* = .67;  $p < .01$ ), High Intensity Pleasure (CBQ *SD* = .98; CBQ-T *SD* = 1.34;  $p < .01$ ), and Smiling/Laughter (CBQ *SD* = .70; CBQ-T *SD* = 1.11;  $p < .01$ ) All of these had more variability in scores when boys were rated by teachers compared to parents, except for Fear which had more variable ratings by parents. Approach/Positive Anticipation was approaching significance (CBQ *SD* = .83; CBQ-T *SD* = 1.02;  $p = .07$ ), with more variability in ratings by teachers compared to parents.

For girls, 5 of 15 scales, yielded significant variability in standard deviations between raters, including Activity Level (CBQ  $SD = .85$ ; CBQ-T  $SD = 1.18$ ;  $p < .01$ ), Falling Reactivity/Soothability (CBQ  $SD = .89$ ; CBQ-T  $SD = 1.20$ ;  $p < .01$ ), Fear (CBQ  $SD = 1.09$ ; CBQ-T  $SD = .85$ ;  $p < .05$ ), Low Intensity Pleasure (CBQ  $SD = .57$ ; CBQ-T  $SD = .71$ ;  $p < .05$ ), and Smiling/Laughter (CBQ  $SD = .57$ ; CBQ-T  $SD = .98$ ;  $p < .01$ ). All of these had more variability in scores when girls were rated by teachers compared to parents, except for Fear which had more variable ratings by parents. Anger/Frustration was approaching significance (CBQ  $SD = 1.12$ ; CBQ-T  $SD = 1.37$ ;  $p = .06$ ), with more variability in ratings by teachers compared to parents. The largest range of scores for parent ratings was on the variables of Anger-Frustration (CBQ range = 5.17) and Shyness (CBQ range = 5.17). Activity Level resulted in the largest range of scores for teacher ratings (CBQ-T range = 5.71). Falling Reactivity/Soothability (CBQ-T range = 5.67) and Impulsivity (CBQ-T range = 5.67) also had large ranges for teacher ratings. The scale of Low Intensity Pleasure produced the smallest range of scores for girls when rated by teachers (CBQ-T range = 2.75), whereas Smiling/Laughter (CBQ range = 2.17) resulted in the smallest range of scores for girls when rated by parents. Low Intensity Pleasure (CBQ range = 2.63) also resulted in a small range of scores for girls when rated by parents.

Overall, boys' scores resulted in significant variability in standard deviations between raters for 4 scales, three of which were more variable for teachers. Girls' scores resulted in significant differences in variability between raters on 5 scales with teacher ratings producing more variability on 4 of the scales. Fear was the only scale for both boys and girls to produce larger standard deviations by parent raters. Activity Level and Smiling/Laughter were the only two scales that were found to have larger standard deviations for both boys and girls when rated

by teachers compared to parents, and the others were unique by gender (i.e., High Intensity Pleasure for boys; Falling Reactivity/Soothability and Low Intensity Pleasure for girls).

Table 11

*Descriptive Statistics for Boys on the CBQ (N=48) Compared to the CBQ-T (N=65)*

Scale	<i>M (SD)</i>	Min.-Max.	Range	Cohen's <i>d</i>	<i>F</i> -Test <i>p</i> -value
Activity Level					
CBQ	4.99 (.81)	3.14-7.00	3.86		
CBQ-T	4.61 (1.40)	1.29-6.86	5.57	.33	.00**
Anger/Frustration					
CBQ	4.18 (1.20)	1.50-6.67	5.17		
CBQ-T	3.52 (1.31)	1.17-6.17	5.00	.52	.27
Approach/Positive Anticipation					
CBQ	5.07 (.83)	3.50-6.67	3.17		
CBQ-T	4.61 (1.02)	1.50-7.00	5.50	.49	.07
Attentional Focusing					
CBQ	5.31 (.92)	2.50-6.83	4.33		
CBQ-T	4.96 (1.06)	2.33-7.00	4.67	.35	.15
Discomfort					
CBQ	3.64 (1.33)	1.17-6.50	5.33		
CBQ-T	3.55 (1.20)	1.50-7.00	5.50	.07	.22
Falling Reactivity/Soothability					
CBQ	4.84 (1.22)	2.00-6.50	4.50		
CBQ-T	4.42 (1.04)	2.00-6.17	4.17	.37*	.11
Fear					
CBQ	4.07 (1.17)	1.83-6.67	4.83		
CBQ-T	3.63 (.67)	2.33-5.50	3.17	.46*	.00**
High Intensity Pleasure					
CBQ	5.01 (.98)	2.67-7.00	4.33		
CBQ-T	4.73 (1.34)	1.50-7.00	5.50	.24	.01**
Impulsivity					
CBQ	4.15 (1.11)	1.33-6.17	4.83		
CBQ-T	4.21 (1.32)	1.33-6.67	5.33	-.05	.11
Inhibitory Control					
CBQ	4.90 (.91)	1.33-6.67	4.50		
CBQ-T	4.48 (1.24)	1.17-6.50	5.33	.39*	.76
Low Intensity Pleasure					
CBQ	5.83 (.69)	1.17-6.50	3.00		
CBQ-T	4.66 (.76)	3.00-6.50	3.50	1.61**	1.00
Perceptual Sensitivity					
CBQ	5.46 (.97)	2.83-6.83	4.00		
CBQ-T	4.77 (.83)	2.50-6.50	4.00	.76**	.11
Sadness					
CBQ	4.24 (.89)	2.29-5.71	3.43		
CBQ-T	3.81 (.92)	2.00-7.00	5.00	.48*	.41
Shyness					
CBQ	3.53 (1.44)	1.00-6.83	5.83		
CBQ-T	3.67 (1.30)	1.00-7.00	6.00	-.10	.22
Smiling & Laughter					
CBQ	5.92 (.70)	4.00-7.00	3.00		
CBQ-T	5.27 (1.11)	2.83-7.00	4.17	.70**	.00**

\* $p < .05$ . \*\* $p < .01$ .Cohen's *d* is positive when higher for boys and negative when higher for girls.

Table 12

*Descriptive Statistics for Girls on the CBQ (N=57) Compared to the CBQ-T (N=63)*

Scale	<i>M (SD)</i>	Min.-Max.	Range	Cohen's <i>d</i>	<i>F</i> -Test <i>p</i> -value
Activity Level					
CBQ	4.62 (.85)	2.43-6.86	4.43		
CBQ-T	3.73 (1.18)	1.29-7.00	5.71	.87**	.01**
Anger/Frustration					
CBQ	4.25 (1.12)	1.50-6.67	5.17		
CBQ-T	3.21 (1.37)	1.00-6.50	5.50	.83**	.06
Approach/Positive Anticipation					
CBQ	5.20 (.82)	2.33-6.83	4.50		
CBQ-T	4.48 (.88)	2.67-6.67	4.00	.85**	.30
Attentional Focusing					
CBQ	5.13 (1.05)	2.33-7.00	4.67		
CBQ-T	5.29 (1.00)	2.33-6.83	4.50	-.16	.36
Discomfort					
CBQ	4.20 (1.28)	2.17-6.83	4.67		
CBQ-T	3.83 (1.14)	1.83-6.17	4.33	.31	.19
Falling Reactivity/Soothability					
CBQ	4.98 (.89)	2.83-6.83	4.00		
CBQ-T	4.73 (1.20)	1.33-7.00	5.67	.24	.01**
Fear					
CBQ	4.12 (1.09)	2.00-6.33	4.33		
CBQ-T	3.92 (.85)	1.83-6.67	4.83	.20	.03*
High Intensity Pleasure					
CBQ	4.75 (1.07)	2.50-6.83	4.33		
CBQ-T	3.77 (1.05)	1.50-7.00	5.50	.92**	.44
Impulsivity					
CBQ	3.83 (.96)	2.17-6.67	4.50		
CBQ-T	3.78 (1.05)	1.00-6.67	5.67	.05	.24
Inhibitory Control					
CBQ	4.92 (.77)	2.50-6.17	3.67		
CBQ-T	5.05 (.91)	2.83-6.50	3.67	-.15	.10
Low Intensity Pleasure					
CBQ	5.93 (.57)	4.38-7.00	2.63		
CBQ-T	5.20 (.71)	3.63-6.38	2.75	1.13**	.05*
Perceptual Sensitivity					
CBQ	5.62 (.77)	3.50-6.67	3.17		
CBQ-T	5.30 (.72)	2.83-6.67	3.83	.43	.31
Sadness					
CBQ	4.24 (.92)	2.57-6.14	3.57		
CBQ-T	3.96 (.83)	2.43-5.86	3.43	.32	.21
Shyness					
CBQ	3.68 (1.18)	1.17-6.33	5.17		
CBQ-T	3.67 (1.30)	1.00-6.50	5.50	.01	.24
Smiling & Laughter					
CBQ	6.02 (.57)	4.83-7.00	2.17		
CBQ-T	5.62 (.98)	3.00-7.00	4.00	.50**	.00**

\**p*<.05. \*\**p*<.01.Cohen's *d* is positive when higher for boys and negative when higher for girls.

Table 13

*Results of t-tests for Boys by Rater on the CBQ and CBQ-T*

Scale	Group				95% CI for Mean Difference	<i>t</i>	<i>df</i>
	CBQ		CBQ-T				
	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>			
Activity Level	4.99 (.81)	45	4.61 (1.40)	45	-.25, .70	.97	44
Anger/Frustration	4.18 (1.20)	45	3.52 (1.31)	45	-.04, .98	1.84	44
Approach/Positive Anticipation	5.07 (.83)	45	4.61 (1.02)	45	-.68, .02	-1.91	44
Attentional Focusing	5.31 (.92)	44	4.96 (1.06)	44	-.03, .79	1.86	43
Discomfort	3.64 (1.33)	45	3.55 (1.20)	45	-.54, .44	-.21	44
Falling Reactivity/Soothability	4.84 (1.22)	45	4.42 (1.04)	45	.05, 1.00	2.23*	44
Fear	4.07 (1.17)	45	3.63 (.67)	45	-.76, -.03	-2.19*	44
High Intensity Pleasure	5.01 (.98)	45	4.73 (1.34)	45	-.11, .84	1.55	44
Impulsivity	4.15 (1.11)	45	4.21 (1.32)	45	-.32, .56	.54	44
Inhibitory Control	4.90 (.91)	45	4.48 (1.24)	45	.02, .81	2.10*	44
Low Intensity Pleasure	5.83 (.69)	45	4.66 (.76)	45	-1.52, -.97	-9.15**	44
Perceptual Sensitivity	5.46 (.97)	45	4.77 (.83)	45	.25, .96	3.44**	44
Sadness	4.24 (.89)	44	3.81 (.92)	44	-.76, -.03	-2.21*	43
Shyness	3.53 (1.44)	45	3.67 (1.30)	45	-.44, .30	-.38	44
Smiling & Laughter	5.92 (.70)	45	5.27 (1.11)	45	-1.06, -.26	-3.35**	44

\* $p < .05$ . \*\* $p < .01$ .

Table 14

*Results of t-tests for Girls by Rater on the CBQ and CBQ-T*

Scale	Group				95% CI for Mean Difference	<i>t</i>	<i>df</i>
	CBQ		CBQ-T				
	<i>M</i> ( <i>SD</i> )	<i>n</i>	<i>M</i> ( <i>SD</i> )	<i>n</i>			
Activity Level	4.62 (.85)	50	3.73 (1.18)	50	.54, 1.25	5.08**	49
Anger/Frustration	4.25 (1.12)	50	3.21 (1.37)	50	.49, 1.37	4.28**	49
Approach/Positive Anticipation	5.20 (.82)	50	4.48 (.88)	50	-1.02, -.40	-4.65**	49
Attentional Focusing	5.13 (1.05)	49	5.29 (1.00)	49	-.46, .35	-.26	48
Discomfort	4.20 (1.28)	49	3.83 (1.14)	49	-.68, .28	-.84	48
Falling Reactivity/Soothability	4.98 (.89)	50	4.73 (1.20)	50	-.17, .58	1.10	49
Fear	4.12 (1.09)	50	3.92 (.85)	50	-.48, .29	-.52	49
High Intensity Pleasure	4.75 (1.07)	49	3.77 (1.05)	49	.72, 1.42	6.15**	48
Impulsivity	3.83 (.96)	50	3.78 (1.05)	50	-.55, .11	-1.32	49
Inhibitory Control	4.92 (.77)	50	5.05 (.91)	50	-.35, .26	-.30	49
Low Intensity Pleasure	5.93 (.57)	50	5.20 (.71)	50	-.98, -.46	-5.57**	49
Perceptual Sensitivity	5.62 (.77)	50	5.30 (.72)	50	-.01, .59	1.92	49
Sadness	4.24 (.92)	50	3.96 (.83)	50	-.54, .04	-1.77	49
Shyness	3.68 (1.18)	50	3.67 (1.30)	50	-.56, .18	-1.02	49
Smiling & Laughter	6.02 (.57)	50	5.62 (.98)	50	-.75, -.18	-3.24**	49

\**p* < .05. \*\**p* < .01.

## Gender Differences in Social Competence

Analyses were conducted separately for boys and girls on the SCBE to compare gender differences using T-scores versus raw scores.

**Gender differences in means and variability.** The means, standard deviations, minimum and maximum values, and ranges for the participants were calculated by gender for the SCBE using both T-scores and raw scores and are shown in Table 15. Table 15 also presents significance of mean differences and effect sizes using Cohen's *d*, in addition to significance of differences between standard deviations using the *F*-test. Tables 16 and 17 present the results of the independent samples *t*-tests of each of the SCBE scales using T-score and raw score data to compare genders and Table 15 displays significance and effect sizes using Cohen's *d*. Positive values of *d* represent higher scores for boys than girls, whereas negative values represent higher scores for girls.

**SCBE T-scores and raw scores.** When comparing boys and girls on SCBE T-scores, 5 of 9 scales yielded higher means for girls compared to boys, though none produced significant differences.

However, when comparing genders on SCBE raw scores, 5 of 9 scales yielded significant differences in means, all of which were higher for girls. Results of the independent samples *t*-tests indicated significant differences on the scales of Angry-Tolerant with a small effect size (boys  $M = 31.36(8.74)$ ; girls  $M = 34.52(7.20)$ ;  $t(122) = -2.19$ ,  $p < .05$ , 95% CI = -6.01 to -.30;  $d = -.40$ ), Aggressive-Calm with a moderate effect size (boys  $M = 33.45(6.88)$ ; girls  $M = 36.72(5.70)$ ;  $t(122) = -2.86$ ,  $p < .01$ , 95% CI = -5.52 to -1.01;  $d = -.52$ ), Egotistical-Prosocial with a moderate effect size (boys  $M = 31.42(7.02)$ ; girls  $M = 35.32(5.89)$ ;  $t(122) = -3.34$ ,  $p < .01$ , 95% CI = -6.21 to -1.58;  $d = -.60$ ), Oppositional-Cooperative with a small effect size (boys  $M =$



35.56(8.00); girls  $M = 38.62(7.97)$ ;  $t(122) = -2.13$ ,  $p < .05$ , 95% CI = -5.90 to -.21;  $d = -.39$ ), and Social Competence with a small effect size (boys  $M = 117.72(30.68)$ ; girls  $M = 128.67(26.80)$ ;  $t(122) = -2.11$ ,  $p < .05$ , 95% CI = -21.22 to -.68;  $d = -.38$ ). Overall, 8 of 9 means (all except Dependent-Autonomous) were higher for girls, 5 of which were significant.

Overall, as hypothesized, raw scores on the SCBE produced more significant mean differences between genders than T-scores, which did not produce any gender differences in means. Raw scores resulted in 5 mean differences with girls scoring higher on all five of the scales (i.e., girls were rated to be more tolerant, calm, prosocial, cooperative, and socially competent than boys).

***F*-tests to compare SDs.** The standard deviations for boys and girls on the SCBE using both T-scores and raw scores were compared using the *F*-test to determine whether significant differences exist between genders (Table 15).

For SCBE T-scores, none of the 15 scales were significantly variable between genders. Though none were significant, the scales of Isolated-Integrated (boys range = 40) and Anxious-Secure (boys range = 40) yielded the largest ranges for boys, whereas Dependent-Autonomous (girls range = 40) yielded the largest range for girls. The scales of Oppositional-Cooperative (boys range = 34) and Dependent-Autonomous (boys range = 34) produced the smallest ranges of scores for boys, whereas Egotistical-Prosocial (girls range = 32) resulted in the smallest range of scores for girls.

For raw scores on the SCBE, boys had larger ranges compared to girls on 7 of 9 scales. Isolated-Integrated (boys range = 41) resulted in the largest range for boys, whereas Oppositional-Cooperative (girls range = 38) resulted in the largest range for girls. The scales of Depressive-Joyful (boys range = 27) and Dependent-Autonomous (boys range = 27) yielded the

smallest ranges for boys and Aggressive-Calm (girls range = 25) yielded the smallest range for girls. None of the 15 scales were significantly variable between boys and girls. However, several of the scales were approaching significance with small to moderate effect sizes. Boys demonstrated more variability on the scales of Angry-Tolerant (boys  $SD = 8.74$ ; girls  $SD = 7.20$ ;  $p = .07$ ;  $d = -.40$ ), Aggressive-Calm (boys  $SD = 6.88$ ; girls  $SD = 5.70$ ;  $p = .07$ ;  $d = -.52$ ), and Egotistical-Prosocial (boys  $SD = 7.02$ ; girls  $SD = 5.89$ ;  $p = .09$ ;  $d = -.60$ ).

In brief, none of the scales were significantly variable when using T-scores or raw scores, though several raw score scales were approaching significance. The three that were approaching significance for gender differences in variability yielded small to moderate effect sizes, and were also scales that were found to have significant mean differences with boys being rated more negatively and with more variability than girls (i.e., more angry, aggressive, and egotistical).

Table 15

*Descriptive Statistics for Boys (N=64) and Girls (N=60) on the SCBE Using T-Scores and Raw Scores*

Scale	<i>T-Scores</i>					<i>Raw Scores</i>				
	<i>M (SD)</i>	Min.- Max.	Range	Cohen's <i>d</i>	<i>F-Test</i> <i>p</i> -value	<i>M (SD)</i>	Min.- Max.	Range	Cohen's <i>d</i>	<i>F-Test</i> <i>p</i> -value
<u>Depressive- Joyful</u>										
Boys	48.80 (9.30)	30-67	37			36.17 (6.82)	21-48	27		
Girls	48.70 (8.88)	32-67	35	.01	.36	37.22 (6.83)	23-49	26	-.15	.50
<u>Anxious- Secure</u>										
Boys	50.30 (9.30)	30-70	40			36.77 (7.49)	17-50	33		
Girls	49.25 (8.92)	30-66	36	.12	.37	37.08 (6.85)	20-48	28	-.04	.24
<u>Angry- Tolerant</u>										
Boys	47.73 (8.68)	33-70	37			31.36 (8.74)	14-50	36		
Girls	48.17 (8.06)	34-68	34	-.05	.28	34.52 (7.20)	19-48	29	-.40*	.07
<u>Isolated- Integrated</u>										
Boys	50.80 (10.24)	30-70	40			35.39 (9.31)	8-49	41		
Girls	50.58 (9.37)	31-70	39	.02	.25	36.82 (7.71)	18-50	32	-.17	.07
<u>Aggressive- Calm</u>										
Boys	49.42 (8.21)	34-70	36			33.45 (6.88)	16-49	33		
Girls	50.32 (8.16)	35-70	35	-.11	.49	36.72 (5.70)	23-48	25	-.52**	.07
<u>Egotistical- Prosocial</u>										
Boys	49.84 (8.39)	34-70	36			31.42 (7.02)	17-47	30		
Girls	51.18 (7.38)	35-67	32	-.17	.16	35.32 (5.89)	20-46	26	-.60**	.09
<u>Oppositional- Cooperative</u>										
Boys	47.55 (8.26)	32-66	34			35.56 (8.00)	17-49	32		
Girls	48.27 (9.06)	30-68	38	-.08	.24	38.62 (7.97)	12-50	38	-.39*	.50
<u>Dependent- Autonomous</u>										
Boys	49.20 (8.12)	32-66	34			35.05 (6.79)	20-47	27		
Girls	47.22 (8.90)	30-70	40	.24	.24	34.05 (7.85)	14-49	35	.14	.13
<u>Social Competence</u>										
Boys	49.17 (8.60)	33-70	37			117.72 (30.68)	61-185	124		
Girls	49.65 (7.85)	30-65	35	-.06	.24	128.67 (26.80)	65-176	111	-.38*	.15

Notes. \* $p < .05$ . \*\* $p < .01$ .

Cohen's  $d$  is positive when higher for boys and negative when higher for girls.

The underlined pole indicates the pole that is associated with a higher score.

Table 16

*Results of t-tests for SCBE T-Score Variables by Gender*

Scale	Group				95% CI for Mean Difference	<i>t</i>	<i>df</i>
	Boys		Girls				
	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>			
Depressive- <u>Joyful</u>	48.80 (9.30)	64	48.70 (8.88)	60	-3.14, 3.33	.06	122
Anxious- <u>Secure</u>	50.30 (9.30)	64	49.25 (8.92)	60	-2.20, 4.29	.64	122
Angry- <u>Tolerant</u>	47.73 (8.68)	64	48.17 (8.06)	60	-3.42, 2.55	-.29	122
Isolated- <u>Integrated</u>	50.80 (10.24)	64	50.58 (9.37)	60	-3.28, 3.71	.12	122
Aggressive- <u>Calm</u>	49.42 (8.21)	64	50.32 (8.16)	60	-3.81, 2.02	-.61	122
Egotistical- <u>Prosocial</u>	49.84 (8.39)	64	51.18 (7.38)	60	-4.16, 1.48	-.94	122
Oppositional- <u>Cooperative</u>	47.55 (8.26)	64	48.27 (9.06)	60	-3.80, 2.36	-.46	122
Dependent- <u>Autonomous</u>	49.20 (8.12)	64	47.22 (8.90)	60	-1.04, 5.01	1.30	122
Social Competence	49.17 (8.60)	64	49.65 (7.85)	60	-3.41, 2.46	-.32	122

\* $p < .05$ . \*\* $p < .01$ .

Table 17

*Results of t-tests for SCBE Raw Score Variables by Gender*

Scale	Group				95% CI for Mean Difference	<i>t</i>	<i>df</i>
	Boys		Girls				
	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>			
Depressive- <u>Joyful</u>	36.17 (6.82)	64	37.22 (6.83)	60	-3.47, 1.38	-.85	122
Anxious- <u>Secure</u>	36.77 (7.49)	64	37.08 (6.85)	60	-2.87, 2.24	-.25	122
Angry- <u>Tolerant</u>	31.36 (8.74)	64	34.52 (7.20)	60	-6.01, -.30	-2.19*	122
Isolated- <u>Integrated</u>	35.39 (9.31)	64	36.82 (7.71)	60	-4.48, 1.62	-.93	122
Aggressive- <u>Calm</u>	33.45 (6.88)	64	36.72 (5.70)	60	-5.52, -1.01	-2.86**	122
Egotistical- <u>Prosocial</u>	31.42 (7.02)	64	35.32 (5.89)	60	-6.21, -1.58	-3.34**	122
Oppositional- <u>Cooperative</u>	35.56 (8.00)	64	38.62 (7.97)	60	-5.90, -.21	-2.13*	122
Dependent- <u>Autonomous</u>	35.05 (6.79)	64	34.05 (7.85)	60	-1.61, 3.60	.76	122
Social Competence	117.72 (30.68)	64	128.67 (26.80)	60	-21.22, -.68	-2.11*	122

\* $p < .05$ . \*\* $p < .01$ .

**Chi-square tests to identify locus of differences.** The proportion of boys and girls at three different points on the SCBE scales' distributions were examined with the purpose of identifying where differences lie in the distribution and whether they are located in the middle, upper, or lower bounds. Chi-square tests were conducted to determine whether proportions significantly differed between the three tertiles, and follow-up tests were completed to identify in which tertiles the differences existed. All of the possible permutations were considered and chi-square tests then compared differences between two tertiles at a time (e.g., compared Tertiles 1 to 2, 2 to 3, and 1 to 3; see Appendix D). T-scores and raw scores were considered and the results are presented in Tables 18 and 19.

When boys and girls were compared on SCBE T-scores, both genders were found to be distributed evenly on all nine scales (Table 18). However, when comparing raw scores, boys and girls were found to be distributed differently on three scales (Table 19). On Depressive-Joyful ( $\chi^2(2, N=124) = 10.33, p < .01$ ), proportionately more boys fell in the middle (boys = 42%, girls = 20%) compared to the upper (boys = 23%, girls = 48%) tertile with the lower tertile indicating more depressive characteristics and the upper tertile indicating more joyful characteristics. Approximately the same number of boys and girls fell in the lower group (boys = 34%, girls = 32%). On Aggressive-Calm ( $\chi^2(2, N=124) = 13.74, p < .01$ ), a larger proportion of boys fell in the lower (boys = 50%, girls = 18%) tertile compared to both the middle (boys = 23%, girls = 37%) and upper (boys = 27%, girls = 45%) tertiles with the lower tertile indicating more aggression and the upper tertile indicating more calm behavior. On Egotistical-Prosocial ( $\chi^2(2, N=124) = 10.57, p < .01$ ), proportionately more boys fell in the lower (boys = 42%, girls = 18%) tertile (rated as more egotistical) compared to the upper (boys = 23%, girls = 47%) tertile (rated as more prosocial).

Overall, out of 27 comparisons for T-scores, there were no significant differences found when comparing tertiles. Out of 27 comparisons for raw scores, there were 4 significant differences found overall, with 2 significant differences pertaining to the extreme and middle tertiles, and 2 differences pertaining to the extreme tertiles (see Appendix D). Overall, raw scores on the SCBE resulted in more gender differences in the extremes of the distribution compared to T-scores, as hypothesized.

The largest differences were found between the extreme tertiles on two scales. On Aggressive-Calm and Egotistical-Prosocial, the largest differences were found at the extremes with a lower percentage of girls in the lower tertiles compared to the upper tertiles. For Depressive-Joyful, the largest difference was found between the middle and upper tertiles with more girls in the upper tertile, and for Aggressive-Calm, a significantly large difference was also found between the lower and middle tertiles with more boys in the lower tertile.

When considering within tertile differences, there was a similar percentages of boys and girls in the lower tertile on Depressive-Joyful and in the middle tertile on Egotistical-Prosocial. On all three scales yielding significant differences, more girls fell in the upper tertiles compared to boys, indicating more positive behaviors (i.e., more joyful, calm, and prosocial), and more boys fell in the lower tertiles compared to girls, indicating more negative behaviors (i.e., more aggressive and egotistical).

Table 18

*Chi-Square Analyses Comparing the Proportion of Boys and Girls in Tertiles on SCBE Scales Using T-Scores*

	Tertile 1		Tertile 2		Tertile 3		$\chi^2$	df	p-value
	(Below the Mean)		(Around the Mean)		(Above the Mean)				
	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)			
Depressive-Joyful	22(34)	20(33)	27(42)	17(28)	15(23)	23(38)	3.93	2	.14
Anxious-Secure	20(31)	19(32)	22(34)	20(33)	22(34)	21(35)	.02	2	.99
Angry-Tolerant	20(31)	18(30)	23(36)	18(30)	21(33)	24(40)	.79	2	.68
Isolated-Integrated	21(33)	18(30)	19(30)	23(38)	24(38)	19(32)	1.07	2	.59
Aggressive-Calm	27(42)	17(28)	17(27)	22(37)	20(31)	21(35)	2.81	2	.25
Egotistical-Prosocial	21(33)	18(30)	25(39)	19(32)	18(28)	23(38)	1.53	2	.47
Oppositional- Cooperative	24(38)	18(30)	20(31)	21(35)	20(31)	21(35)	.78	2	.68
Dependent- Autonomous	18(28)	22(37)	24(38)	23(38)	22(34)	15(25)	1.62	2	.45
Social Competence	24(38)	19(32)	17(27)	19(32)	23(36)	22(37)	.59	2	.75

Notes. \* $p < .05$ . \*\* $p < .01$ .

% indicates percentage of each gender group.



Table 19

*Chi-Square Analyses Comparing the Proportion of Boys and Girls in Tertiles on SCBE Scales Using Raw Scores*

	Tertile 1 (Below the Mean)		Tertile 2 (Around the Mean)		Tertile 3 (Above the Mean)		$\chi^2$	df	p-value
	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)			
Depressive-Joyful	22(34)	19(32)	27(42)	12(20)	15(23)	29(48)	10.33	2	.00**
Anxious-Secure	24(38)	18(30)	19(30)	21(35)	21(33)	21(35)	.83	2	.66
Angry-Tolerant	25(39)	13(22)	21(33)	22(37)	18(28)	25(42)	4.83	2	.09
Isolated-Integrated	24(38)	19(32)	22(34)	22(37)	18(28)	19(32)	.48	2	.79
Aggressive-Calm	32(50)	11(18)	15(23)	22(37)	17(27)	27(45)	13.74	2	.00**
Egotistical-Prosocial	27(42)	11(18)	22(34)	21(35)	15(23)	28(47)	10.57	2	.00**
Oppositional- Cooperative	28(44)	16(27)	19(30)	19(32)	17(27)	25(42)	4.67	2	.10
Dependent- Autonomous	21(33)	22(37)	21(33)	19(32)	22(34)	19(32)	.21	2	.90
Social Competence	25(39)	16(27)	23(36)	20(33)	16(25)	24(40)	3.66	2	.16

Notes. \* $p < .05$  \*\* $p < .01$

% indicates percentage of each gender group.

## **Relations between SC and Temperament in Boys and Girls**

The purpose of the following analyses was to investigate whether patterns of relations between temperament and SC for boys and girls are the same across informants and whether patterns differ when raw versus standard scores are considered.

**Pearson correlations.** Because the purpose of the current study is to compare patterns across raters and with both T-scores and raw scores (see Table 24), the correlations themselves were of less interest. First, correlations were run for each of the 15 temperament scales on the CBQ and CBQ-T with the 8 SCBE subscales using both T-scores and raw scores. Next, correlations between the 15 temperament scales on the CBQ and CBQ-T and the overall SC composite score on the SCBE (using both the T-score and raw score) were conducted (see Tables 20, 21, 22, 23).

**CBQ correlations with SCBE subscales.** There was a larger number of significant correlations between the CBQ and SCBE subscale T-scores for girls compared to boys. Some CBQ scales resulted in multiple significant correlations with SCBE subscales, including Shyness, which yielded 3 negative correlations for both boys and girls. Inhibitory Control yielded 4 positive correlations with SCBE subscales for boys and only one for girls. Anger/Frustration yielded 3 negative correlations for girls and none for boys, and Smiling/Laughter positively correlated with 3 SCBE subscales for girls, but not for boys. The SCBE subscale of Oppositional-Cooperative yielded 5 significant correlations with dimensions of temperament on the CBQ for girls and only two for boys.

**Raw versus T-scores.** For boys, there were 7 significant correlations between parent-rated temperament and SCBE subscales when using T-scores and 9 significant correlations when using raw scores. When using T-scores, 18 significant correlations were found for girls compared to 13 that were found when using raw scores. There were four correlations for each

gender that only produced significant results when either raw or T-scores were used, and for boys, this pattern only occurred on the scale of Inhibitory Control. For boys, raw scores produced more significant results than T-scores, whereas T-scores produced more significant results than raw scores for girls.

***CBQ-T correlations with SCBE subscales.*** Overall, there were a larger number of significant correlations found between teacher than parent ratings of temperament and SCBE subscales on the SCBE, which was hypothesized and not surprising because both measures were completed by the same rater. For boys, there were 75 significant correlations found between the CBQ-T and SCBE subscale T-scores, and girls had slightly more with 82 significant correlations.

***Raw versus T-scores.*** When considering raw scores, there were 76 significant correlations between the CBQ-T and SCBE subscales for boys, and girls were similar with 79 significant correlations. The use of T-scores or raw scores generally did not affect results, which was not as hypothesized. For boys, there was one significant correlation that only resulted from T-scores and not raw scores, and for girls, there were three correlations that only resulted from T-scores and not raw scores. Overall, for teachers, the use of raw scores versus T-scores made less of a difference compared to parents.

***Temperament correlations with the SC composite score.*** There were no commonalities between boys and girls when considering the correlations between parent-rated temperament and the SC composite score on the SCBE. Inhibitory Control was significantly correlated with SC for boys ( $r = .31, p < .05$  for raw score only), whereas Shyness ( $r = -.34, -.34, p < .05$  for T-score and raw score, respectively) and Smiling/Laughter ( $r = .30, .32, p < .05$  for T-score and raw score, respectively) were significantly correlated with SC for girls.

However, there were seven commonalities between boys and girls when teacher ratings of temperament were correlated with SC, including Anger/Frustration (boys  $r = -.40, -.41, p < .01$ ; girls  $r = -.42, -.42, p < .01$  for T-scores and raw scores, respectively), Attentional Focusing (boys  $r = .42, .42, p < .01$ ; girls  $r = .52, .55, p < .01$  for T-scores and raw scores, respectively), Falling Reactivity/Soothability (boys  $r = .41, .41, p < .01$ ; girls  $r = .45, .45, p < .01$  for T-scores and raw scores, respectively), Fear (boys  $r = -.38, -.37, p < .01$ ; girls  $r = -.31, -.32, p < .05$  for T-scores and raw scores, respectively), Inhibitory Control (boys  $r = .48, .48, p < .01$ ; girls  $r = .49, .50, p < .01$  for T-scores and raw scores, respectively), Shyness (boys  $r = -.34, -.33, p < .01$ ; girls  $r = -.40, -.40, p < .01$  for T-scores and raw scores, respectively), and Smiling/Laughter (boys  $r = .46, .44, p < .01$ ; girls  $r = .53, .53, p < .01$  for T-scores and raw scores, respectively). Five additional dimensions of teacher-rated temperament were found to be significantly correlated with SC for only girls, including Approach/Positive Anticipation ( $r = .27, p < .05$  for T-score only), High Intensity Pleasure ( $r = .30, .29, p < .05$  for T-scores and raw scores, respectively), Impulsivity ( $r = .26, p < .05$  for raw score only), Low Intensity Pleasure ( $r = .47, .47, p < .01$  for T-scores and raw scores, respectively), and Perceptual Sensitivity ( $r = .56, .55, p < .01$  for T-scores and raw scores, respectively).

When comparing T-scores and raw scores, parent-rated Inhibitory Control was only significantly correlated with SC for boys when the raw score was used. For teacher ratings, Impulsivity was significantly correlated with SC for girls only when using the raw score, whereas only the T-score for SC significantly correlated with Approach/Positive Anticipation for girls. Otherwise, all other significant correlations were found to be significant for both T-scores and raw scores.

Table 20

*Pearson Correlations of CBQ Scales with SCBE T-Scores and Raw Scores for Boys*

CBQ Scales	T-Scores/Raw Scores for SCBE Scales								
	Depressive -Joyful	Anxious -Secure	Angry -Tolerant	Isolated -Integrated	Aggressive -Calm	Egotistical -Prosocial	Oppositional -Cooperative	Dependent -Autonomous	SC Composite
Activity Level	.01/-.05	.07/.07	-.04/-.06	-.13/-.17	-.07/-.08	-.09/-.10	-.11/-.11	.01/-.01	-.07/-.09
Anger/ Frustration	.01/-.01	.16/.18	-.10/-.07	.08/.03	-.13/-.10	-.07/-.05	.06/.08	-.06/-.05	.04/.05
Approach/Positive Anticipation	.27/.26	.03/.05	.00/.01	.14/.09	-.12/-.13	-.02/.02	.06/.09	.05/.05	.09/.07
Attentional Focusing	.02/.03	.02/.01	.09/.11	.12/.09	.09/.09	.07/.09	.11/.18	.26/.27	.11/.12
Discomfort Falling Reactivity/ Soothability	.08/.04	.00/-.05	-.02/.00	.01/.00	.03/.05	-.11/-.10	.09/.09	-.19/-.18	-.04/-.04
Fear High Intensity Pleasure	-.04/-.04	.02/-.03	-.17/-.19	.00/-.01	-.20/-.17	-.20/-.19	-.06/-.08	.04/.02	-.06/-.07
	.06/.03	-.09/-.12	.11/.06	-.14/-.19	.04/.03	-.08/-.11	.02/-.01	.16/.11	-.03/-.03
Impulsivity Inhibitory Control	.18/.18	.36*/.34*	-.13/-.14	.16/.12	-.24/-.24	-.15/-.16	-.17/-.18	.18/.12	.04/.00
Low Intensity Pleasure	.17/.15	-.01/.04	.20/.22	.11/.15	.34*/.23	.26/.27	.27/.30*	.22/.31*	.29/.31*
Perceptual Sensitivity	.02/-.05	-.08/-.09	.11/.10	-.33*/-.36*	.11/.17	.18/.17	.33*/.33*	.15/.13	-.02/-.01
	.25/.25	.02/.01	-.15/-.16	.07/.13	-.19/-.19	-.16/-.16	-.05/-.05	.11/.11	.05/.05
Sadness	.15/.14	.03/.06	-.15/-.15	.16/.15	-.18/-.18	-.16/-.14	-.02/-.01	.02/.04	.06/.08
Shyness Smiling & Laughter	-.33*/-.35*	-.33*/-.35*	.08/.06	-.36*/-.36*	.24/.24	.05/.05	.17/.13	-.08/-.06	-.13/-.11
	.04/.00	.05/.05	-.11/-.12	-.07/-.07	-.03/-.04	.06/.03	.08/.08	-.05/-.05	-.00/-.01

\* $p < .05$ . \*\* $p < .01$ .

Table 21

*Pearson Correlations of CBQ-T Scales with SCBE T-Scores and Raw Scores for Boys*

CBQ-T Scales	T-Scores/Raw Scores for SCBE Scales								
	Depressive -Joyful	Anxious -Secure	Angry -Tolerant	Isolated -Integrated	Aggressive -Calm	Egotistical- Prosocial	Oppositional -Cooperative	Dependent -Autonomous	SC Composite
Activity Level	.33**/.36**	.22/.24	-.47**/-.44**	.36**/.41**	-.53**/-.54**	-.53**/-.52**	-.49**/-.45**	-.18/-.17	-.08/-.08
Anger/ Frustration	-.21/-.19	-.22/-.23	-.76**/-.78**	-.08/-.03	-.54**/-.52**	-.62**/-.62**	-.68**/-.67**	-.48**/-.51**	-.40**/-.41**
Approach/Positive Anticipation	.32**/.35**	.25/.28*	-.45**/-.42**	.31**/.37**	-.49**/-.50**	-.41**/-.41**	-.44**/-.39**	-.10/-.09	-.01/-.01
Attentional Focusing	.11/.11	.24/.21	.46**/.44**	.16/.11	.49**/.51**	.41**/.39**	.53**/.49**	.44**/.42**	.42**/.42**
Discomfort Falling Reactivity/ Soothability	-.17/-.17	-.21/-.19	-.46**/-.46**	-.12/-.05	-.21/-.20	-.17/-.17	-.28**/-.25*	-.35**/-.32**	-.20/-.21
Fear High Intensity Pleasure	-.19/-.17	-.35**/-.34**	-.44**/-.44**	-.27**/-.25*	-.37**/-.33**	-.33**/-.32**	-.33**/-.31*	-.48**/-.48**	-.38**/-.37**
Impulsivity Inhibitory Control	.29**/.34**	.25**/.26*	-.24/-.23	.37**/.40**	-.35**/-.36**	-.31**/-.30*	-.36**/-.34**	-.07/-.08	.04/.03
Low Intensity Pleasure	.37**/.37**	.28**/.28*	-.43**/-.40**	.37**/.42**	-.53**/-.53**	-.47**/-.46**	-.46**/-.42**	-.17/-.17	-.04/-.05
Perceptual Sensitivity	.11/.10	.18/.17	.61**/.61**	.14/.08	.65**/.64**	.57**/.57**	.64**/.64**	.53**/.54**	.48**/.48**
Sadness	.16/.12	.00/.02	.11/.11	.02/.01	.17/.19	.27**/.26*	.10/.11	-.10/-.07	.13/.13
Shyness	.15/.14	.08/.08	.04/.06	-.02/.00	.02/.05	.05/.04	-.10/-.07	.08/.07	.08/.06
Smiling & Laughter	-.14/-.14	-.12/-.12	-.58**/-.56**	.01/.08	-.26**/-.23	-.28**/-.27*	-.43**/-.37**	-.31/-.29	-.19/-.19
	-.55**/-.56**	-.60**/-.61**	.04/.02	-.58**/-.59**	.16/.16	.08/.07	.14/.11	-.22/-.23	-.34**/-.33**
	.58**/.59**	.53**/.53**	.08/.10	.68**/.67**	.04/.04	.03/.06	.03/.10	.27**/.28*	.46**/.44**

\* $p < .05$ . \*\* $p < .01$ .

Table 22

*Pearson Correlations of CBQ Scales with SCBE T-Scores and Raw Scores for Girls*

CBQ Scales	T-Scores/Raw Scores for SCBE Scales								
	Depressive -Joyful	Anxious -Secure	Angry -Tolerant	Isolated -Integrated	Aggressive -Calm	Egotistical -Prosocial	Oppositional -Cooperative	Dependent -Autonomous	SC Composite
Activity Level	.15/.17	.03/.01	-.22/-.20	.01/.01	-.35*/-.30*	-.33*/-.31*	-.14/-.17	.07/.06	.03/.04
Anger/ Frustration	-.08/-.07	-.03/-.04	-.26/-.28	-.09/-.09	-.31*/-.30*	-.29*/-.29*	-.34*/-.38**	-.05/-.01	-.15/-.16
Approach/Positive Anticipation	.08/.10	-.10/-.13	-.08/-.07	.10/.15	-.15/-.09	-.05/-.03	-.06/-.07	.02/.02	.08/.10
Attentional Focusing	.10/.10	.05/.04	.01/-.02	.01/-.02	.06/.05	.00/-.02	.09/.09	.00/-.03	.07/.05
Discomfort	.21/.23	.20/.17	.21/.15	.13/.14	.11/.13	.05/.05	-.09/-.13	.05/.08	.12/.14
Falling Reactivity/ Soothability	.04/.03	.09/.09	.39**/.39**	.02/.01	.16/.14	.09/.07	.37*/.34*	.16/.11	.09/.08
Fear High Intensity	.01/.02	-.16/-.17	-.18/-.20	-.07/-.04	-.21/-.18	-.14/-.12	-.29*/-.25	-.05/-.01	-.05/-.04
Pleasure	.18/.21	.20/.20	.04/.06	.10/.11	.09/.12	.06/.04	.14/.13	.18/.21	.25/.26
Impulsivity Inhibitory	.27/.26	.15/.15	.07/.06	.14/.14	.00/.00	.01/.01	.07/.05	.22/.23	.27/.27
Control Low Intensity	.10/.09	.24/.24	.26/.28	.27/.26	.27/.26	.22/.21	.33*/.31*	.21/.16	.15/.15
Pleasure Perceptual	-.03/-.02	-.06/-.08	.22/.17	.11/.12	.14/.18	.19/.21	.20/.17	.04/.04	.07/.07
Sensitivity	.03/.01	.21/.21	.13/.11	.02/.01	-.05/-.07	-.11/-.14	-.06/-.13	.09/.06	.06/.05
Sadness	.13/.13	.04/.01	-.21/-.21	.07/.07	-.29*/-.28	-.27/-.25	-.33*/-.30*	-.08/-.07	-.01/-.01
Shyness	-.31*/-.28	-.15/-.14	-.20/-.21	-.26/-.23	-.01/-.02	-.10/-.11	-.28/-.25	-.34*/-.30	-.34*/-.34*
Smiling & Laughter	.37**/.41**	.32*/.27	.16/.19	.36*/.38**	.02/.05	.10/.12	.05/.00	.09/.05	.30*/.32*

\* $p < .05$ . \*\* $p < .01$ .

Table 23

*Pearson Correlations of CBQ-T Scales with SCBE T-Scores and Raw Scores for Girls*

CBQ-T Scales	T-Scores/Raw Scores for SCBE Scales								
	Depressive -Joyful	Anxious -Secure	Angry -Tolerant	Isolated -Integrated	Aggressive -Calm	Egotistical- Prosocial	Oppositional -Cooperative	Dependent -Autonomous	SC Composite
Activity Level	.37**/.38**	.40**/.38**	-.24/-.22	.34**/.33*	-.35**/-.33*	-.23/-.22	-.25/-.19	.05/.10	.22/.21
Anger/ Frustration	-.25/-.23	-.23/-.24	-.72**/-.74**	-.37**/-.38**	-.60**/-.60**	-.61**/-.60**	-.73**/-.72**	-.47**/-.46**	-.42**/-.42**
Approach/Positive Anticipation	.33**/.34**	.22/.19	-.18/-.16	.25/.24	-.28*/-.24	-.19/-.18	-.18/-.14	.12/.10	.27*/.25
Attentional Focusing	.32**/.35**	.34**/.36**	.41**/.42**	.38**/.41**	.53**/.55**	.48**/.48**	.50**/.48**	.43**/.42**	.52**/.55**
Discomfort Falling Reactivity/ Soothability	-.19/-.19	-.17/-.18	-.33*/-.33*	-.03/-.03	-.20/-.22	-.24/-.24	-.26*/-.29*	-.50**/-.50**	-.20/-.19
Fear High Intensity Pleasure	-.33*/-.30*	-.41**/-.44**	-.24/-.24	-.29*/-.31*	-.19/-.21	-.15/-.16	-.21/-.25	-.49**/-.51**	-.31*/-.32*
Impulsivity Inhibitory Control	.43**/.42**	.36**/.35**	-.18/-.17	.40**/.41**	-.20/-.19	-.11/-.09	-.15/-.09	.05/.09	.30*/.29*
Low Intensity Pleasure	.46**/.45**	.45**/.43**	-.18/-.17	.38**/.37**	-.28*/-.29*	-.18/-.18	-.18/-.15	.05/.05	.26*/.25
Perceptual Sensitivity	.23/.24	.25/.28*	.59**/.59**	.36**/.36**	.64**/.62**	.57**/.56**	.63**/.57**	.46**/.43**	.49**/.50**
Sadness	.42**/.42**	.20/.19	.33*/.33*	.33**/.32*	.30*/.31*	.35**/.35**	.37**/.33*	.21/.18	.47**/.47**
Shyness	.48**/.50**	.26*/.26*	.19/.24	.35**/.36**	.23/.24	.24/.23	.22/.24	.26*/.22	.56**/.55**
Smiling & Laughter	-.07/-.06	-.14/-.17	-.46**/-.47**	-.01/-.04	-.32*/-.34**	-.37**/-.37**	-.37**/-.39**	-.47**/-.49**	-.19/-.19
	-.48**/-.47**	-.58**/-.58**	-.14/-.16	-.45**/-.45**	.09/.08	-.02/-.02	-.11/-.13	-.44**/-.43**	-.40**/-.40**
	.63**/.65**	.48**/.47**	.11/.13	.59**/.59**	.13/.15	.14/.16	.14/.14	.30*/.27*	.53**/.53**

\* $p < .05$ . \*\* $p < .01$ .



Table 24

*Patterns of Correlations Between the CBQ/CBQ-T and the SCBE Social Competence Composite Score (T-score and Raw Score) for Boys and Girls*

CBQ Scale	Boys Only	Girls Only	Both Genders
Activity Level			
SCBE T-Scores			
SCBE Raw Scores			
Anger/Frustration*			
T-Scores			x
Raw Scores			x
Approach/Positive Anticipation			
T-Scores		x	
Raw Scores		x	
Attentional Focusing			
T-Scores			x
Raw Scores			x
Discomfort			
T-Scores			
Raw Scores			
Falling Reactivity/Soothability			
T-Scores			x
Raw Scores			x
Fear*			
T-Scores			x
Raw Scores			x
High Intensity Pleasure			
T-Scores		x	
Raw Scores		x	
Impulsivity			
T-Scores		x	
Raw Scores			
Inhibitory Control			
T-Scores			x
Raw Scores	^		x
Low Intensity Pleasure			
T-Scores		x	
Raw Scores		x	
Perceptual Sensitivity			
T-Scores		x	
Raw Scores		x	
Sadness			
T-Scores			
Raw Scores			
Shyness*			
T-Scores		^	x
Raw Scores		^	x
Smiling & Laughter			
T-Scores		^	x
Raw Scores		^	x

Notes. ^ indicates CBQ scales and x indicates CBQ-T scales. \*denotes CBQ-T scales that are *negatively* correlated with the Social Competence composite scale.

**Linear regression analyses.** In order to understand whether there was a classroom effect controlling for age, parameter estimates were conducted using HLM 7 Software for Windows (Raudenbush, Bryk, & Congdon, 2004) with the data defined as a two-way fixed effects hierarchical linear model. Level 1 was defined as the number of preschool child participants ( $N=113$ ;  $CBQT\ Scale = \beta_{0j} + \beta_{1j}*(C\_AGE_{ij}) + r_{ij}$ ) and Level 2 was defined as the number of classrooms ( $N=6$ ) centered around age ( $\beta_{0j} = \gamma_{00} + u_{0j}$ ,  $\beta_{1j} = \gamma_{10} + u_{1j}$ ). When both age and class were considered simultaneously, there was no impact of the effect of class on the criterion variable. These analyses were conducted with the CBQ-T, SCBE T-scores, and SCBE raw score data specified as the criterion, with non-statistically significant parameter estimates (see Appendix E for a full description and the analyses).

Linear regression analyses were conducted to investigate whether gender is a potential moderator between the relationship of temperament and SC. The primary interest was to investigate the moderating effects of gender on the relations between temperament and SC with both variables measured in two ways—temperament with different informants and SC using both T-scores and raw scores. Therefore, analyses were run separately for parent- and teacher-rated temperament and with both T-scores and raw scores for the SC composite score on the SCBE. Age in months and gender were entered first, the temperament scale (CBQ or CBQ-T) was entered second, and the interaction of gender x CBQ/CBQ-T scale was entered third with the SC composite score (T-score or raw score) entered as the criterion variable. The interaction term was computed as a product of the temperament variable in question and gender (dummy coded 1 for males, 2 for females).

For those regressions that yielded significant interactions, simple slope analyses were also computed for each significant interaction in order to evaluate whether the relationship

(slope) between temperament and SC is significant at a particular value of the moderator (gender; Cohen, Cohen, West, & Aiken, 2003). The significance of the simple slope was tested by comparing the ratio of the slope to its standard error with a  $t$ -distribution with  $n-k-1$  degrees of freedom, where  $k$  is the number of predictors in the model (Dawson, 2014). First, an overview of interactions by temperament rater and SC T-score and raw score patterns are outlined. Then, each significant interaction and their simple slopes results are reported.

***Overview of interactions by temperament rater and SC T-scores or raw scores.***

*CBQ ratings and SC T-scores.* Five parent-rated temperament scales were found to have a significant interaction effect with gender with SC T-scores defined as the dependent variable, including Activity Level ( $F(1, 85) = 4.29, p < .05$ ), Inhibitory Control ( $F(1, 80) = 12.65, p < .001$ ), Low Intensity Pleasure ( $F(1, 80) = 36.87, p < .001$ ), Sadness ( $F(1, 67) = 10.53, p < .01$ ), and Shyness ( $F(1, 81) = 12.13, p < .001$ ). On these temperament dimensions, neither gender nor temperament alone predicted SC and the relationship between temperament and SC varied with gender, hence gender served as a moderator.

*CBQ-T ratings and SC T-scores.* Five teacher-rated temperament scales were found to have a significant interaction effect with gender when SC T-scores were used as the criteria, including Activity Level ( $F(1, 111) = 4.08, p < .05$ ), Falling Reactivity/Soothability ( $F(1, 110) = 8.15, p < .01$ ), Inhibitory Control ( $F(1, 93) = 11.71, p < .001$ ), Sadness ( $F(1, 72) = 158.67, p < .001$ ), and Smiling/Laughter ( $F(1, 108) = 5.86, p < .01$ ). Falling Reactivity/ Soothability and Smiling/Laughter were not found to have significant interactions with gender in the prediction of SC for parent ratings and were unique to teacher raters, whereas Low Intensity Pleasure and Shyness were unique to parent raters. Activity Level, Inhibitory Control, and Sadness were found to have significant interactions with gender for both parent and teacher raters.

*CBQ ratings and SC raw scores.* Eight parent-rated temperament scales were found to have a significant interaction effect with gender when SC raw scores were the criterion variable, including Activity Level ( $F(1, 85) = 4.04, p < .05$ ), Anger/Frustration ( $F(1, 83) = 3.86, p < .05$ ), Attentional Focusing ( $F(1, 84) = 4.71, p < .05$ ), Inhibitory Control ( $F(1, 80) = 16.05, p < .001$ ), Low Intensity Pleasure ( $F(1, 80) = 46.38, p < .001$ ), Perceptual Sensitivity ( $F(1, 78) = 5.01, p < .05$ ), Sadness ( $F(1, 67) = 16.58, p < .001$ ), and Shyness ( $F(1, 81) = 11.29, p < .001$ ).

Anger/Frustration, Attentional Focusing, and Perceptual Sensitivity were not found to have significant interactions with gender in the prediction of SC for parent ratings when T-scores were used and were unique to the use of raw scores. Activity Level, Inhibitory Control, Low Intensity Pleasure, Sadness, and Shyness were significant for both T-scores and raw scores. Overall, raw scores produced more significant relations with temperament and gender interactions for parent ratings of temperament.

*CBQ-T ratings and SC raw scores.* Five teacher-rated temperament scales were found to have a significant interaction effect with gender when SC raw scores were entered as the criterion variable, including Activity Level ( $F(1, 111) = 4.08, p < .05$ ), Falling Reactivity/Soothability ( $F(1, 110) = 7.29, p < .01$ ), Inhibitory Control ( $F(1, 93) = 14.15, p < .001$ ), Sadness ( $F(1, 72) = 171.55, p < .001$ ), and Smiling/Laughter ( $F(1, 108) = 3.95, p < .05$ ). All five of these scales were also found to have significant interactions with gender in the prediction of SC for teacher ratings when T-scores were used. Activity Level, Inhibitory Control, and Sadness were found to have significant interactions with gender for both parent and teacher raters when using raw scores. Falling Reactivity/Soothability and Smiling/Laughter were unique to teacher ratings and were not found to interact with gender for parent ratings of temperament.

*Overview of moderating effects of gender for temperament interactions by rater and raw and T-scores.* In this section, information regarding each temperament variable's interaction with gender is outlined. Figures 1 through 10 display those interactions between gender and temperament that were significant in the prediction of SC and are organized by panels comparing temperament raters and types of SC scores (T-scores or raw scores).

*Moderating effects of gender for activity level.* Figure 1 displays the Activity Level x gender interactions. The interaction was significant across raters and for both T-scores and raw scores on the SCBE. There was a significant interaction between gender and parent-rated Activity Level using SCBE T-scores ( $F(1, 85) = 4.29, p < .05$ ) and raw scores ( $F(1, 85) = 4.04, p < .05$ ), as well as gender and teacher-rated Activity Level using SCBE T-scores ( $F(1, 111) = 4.08, p < .05$ ) and raw scores ( $F(1, 111) = 4.08, p < .05$ ). On the parent-rated CBQ, simple slope analyses indicated that the slope using SCBE T-scores was not significant for boys ( $p = .81$ ) or girls ( $p = .77$ ). Slopes were not significant for boys ( $p = .76$ ) or girls ( $p = .75$ ) on the CBQ when using raw SCBE scores. On the CBQ-T, simple slope analyses did not yield significant slopes for boys ( $p = .38, .38$ ) or girls ( $p = .10, .11$ ) when using T-scores or raw scores, respectively.

Across raters and with both T-scores and raw scores, girls who were rated to have a high activity level had a higher SC score (positive slope), whereas boys who had a higher activity level had a lower SC score (negative slope). Girls with high activity level were rated higher on SC by teachers and parents and the interaction effect appears larger at the upper extreme of activity level than at the lower extreme for both raters. For parent ratings, there appear to be no gender differences at the lower end of Activity Level when considering raw scores, though gender differences appear at the lower end of Activity Level when T-scores are used as hypothesized. For teacher ratings, the difference between the high and low ends of activity level

was greater for girls compared to boys, and activity level appears to make less of a difference for boys than girls resulting in a smaller negative difference in SC as activity level increases. Figure 1 reveals that gender differences tended to emerge in higher or lower scores. Parent-rated Activity Level's interaction with gender uniquely accounted for 5% of the variance in participants' SC T-score and 4% of the variance in the SC raw score. For teacher ratings on Activity Level, the interaction with gender uniquely accounted for 4% of the variance in the SC T-score and 3% of the variance in the SC raw score.

*Moderating effects of gender for inhibitory control.* Inhibitory Control interacted with gender in the prediction of SC when using raw and standard scores for both raters and the four interaction graphs are displayed in Figure 2. There was a significant interaction between gender and parent-rated Inhibitory Control using T-scores ( $F(1, 80) = 12.65, p < .001$ ) and raw scores ( $F(1, 80) = 16.05, p < .001$ ) on the SCBE and between gender and teacher-rated Inhibitory Control using SCBE T-scores ( $F(1, 93) = 11.71, p < .001$ ) and raw scores ( $F(1, 93) = 14.15, p < .001$ ). On the parent-rated CBQ, simple slope analyses indicated nonsignificant slopes for boys ( $p = .10, p = .06$ ) and girls ( $p = .34, p = .33$ ) using both SCBE T-scores and raw scores, respectively. On the CBQ-T, simple slope analyses indicated significant slopes for both boys ( $p < .001, p < .001$ ) and girls ( $p < .001, p < .001$ ) when using T-scores and raw scores on the SCBE, respectively. This indicated a significant positive relationship between Inhibitory Control and SC for both genders when rated by teachers.

Across raters and with both T-scores and raw scores, the general trend was that girls and boys who were rated to have higher inhibitory control had a higher SC score (positive slopes), though there was a steeper slope for teacher raters compared to parents. The effect was greater at the upper extreme of Inhibitory Control for boys when rated by parents. For teacher ratings,

lower Inhibitory Control resulted in clinically significant low levels of SC and had a more deleterious effect on SC for girls compared to boys. In other words, girls who received the same scores as boys at the lower end of Inhibitory Control had lower scores on SC. At the higher end of Inhibitory Control, the gender difference appeared to lessen and eventually evened out for teacher ratings.

Parent-rated Inhibitory Control's interaction with gender uniquely accounted for 13% of the variance in participants' SC T-score and 15% of the variance in the SC raw score. For teacher ratings on Inhibitory Control, the interaction with gender uniquely accounted for 9% of the variance in the SC T-score and 10% of the variance in the SC raw score. There was a significant main effect for parent-rated Inhibitory Control using raw scores ( $F(1, 81) = 4.22, p < .05$ ), and for teacher-ratings using both T-scores ( $F(1, 94) = 24.98, p < .001$ ) and raw scores ( $F(1, 94) = 25.70, p < .001$ ).

*Moderating effects of gender for low intensity pleasure.* Interaction effects between Low Intensity Pleasure and gender are displayed in Figure 3 and were only significant for parent ratings when using both SCBE T-scores ( $F(1, 80) = 36.87, p < .001$ ) and raw scores ( $F(1, 80) = 46.38, p < .001$ ). Simple slope analyses revealed nonsignificant slopes for both boys ( $p = .92, p = .99$ ) and girls ( $p = .76, p = .65$ ) on the CBQ when using SCBE T-scores and raw scores, respectively.

No gender differences are apparent at the lower extreme of Low Intensity Pleasure when using raw scores, though differences appear at the lower extreme when T-scores are considered. Lower ratings on Low Intensity Pleasure seem to have a more negative effect on SC for girls than boys, but when only T-scores are compared. When raw scores are used, a larger gender difference emerges at the higher end of Low Intensity Pleasure with girls rated higher on SC.

Also, for both T-scores and raw scores, Low Intensity Pleasure has little effect on SC ratings at the low, middle, and high ends for boys. However, parent-rated Low Intensity Pleasure's interaction with gender uniquely accounted for 32% of the variance in participants' SC T-score and 35% of the variance in the SC raw score.

*Moderating effects of gender for sadness.* Figure 4 displays the Sadness x gender interactions. There was a significant interaction between gender and parent-rated Sadness using SCBE T-scores ( $F(1, 67) = 10.53, p < .01$ ) and raw scores ( $F(1, 67) = 16.58, p < .001$ ), as well as gender and teacher-rated Sadness using T-scores ( $F(1, 72) = 158.67, p < .001$ ) and raw scores ( $F(1, 72) = 171.55, p < .001$ ) on the SCBE. On the parent-rated CBQ, simple slope analyses indicated that the slopes for boys ( $p = .26, p = .17$ ) and girls ( $p = .88, p = .78$ ) were nonsignificant using both SCBE T-scores and raw scores, respectively. On the CBQ-T, simple slope analyses indicated nonsignificant slopes for boys ( $p = .26, p = .23$ ), though significant slopes for girls ( $p < .05, p < .05$ ) when using T-scores and raw scores on the SCBE, respectively.

For teacher ratings with both T-scores and raw scores, the general trend was that girls and boys who were rated to be sadder had a lower social competence score. Sadness had a more deleterious effect on SC for boys compared to girls and the same levels of high sadness for both genders translated to lower levels of SC for boys. Lower levels of sadness in girls were associated with higher SC, though Sadness did not have as much of an effect on SC for boys. However, for parent ratings using T-scores and raw scores, the trend was reversed for girls in that higher sadness predicted higher scores on SC, though for boys SC ratings remained the same across low, moderate, and high levels of sadness. Also, for parents, there were larger gender differences for lower levels of Sadness when raw scores were used compared to T-scores. Gender differences appeared similar for T-scores and raw scores on teacher ratings.



Parent-rated Sadness and its interaction with gender uniquely accounted for 13% of the variance in participants' SC T-score and 19% of the variance in the SC raw score on the CBQ. Teacher-rated Sadness and its interaction with gender uniquely accounted for 64% of the variance in participants' SC T-score and 63% of the variance in the SC raw score on the CBQ-T. There was a significant main effect for teacher-rated Sadness using both T-scores ( $F(1, 73) = 5.17, p < .05$ ) and raw scores ( $F(1, 73) = 5.54, p < .05$ ).

*Moderating effects of gender for shyness.* Interaction effects between Shyness and gender are displayed in Figure 5 and were only significant for parent ratings when using both SCBE T-scores ( $F(1, 81) = 12.13, p < .001$ ) and raw scores ( $F(1, 81) = 11.29, p < .001$ ). Simple slope analyses revealed nonsignificant slopes for boys on the CBQ when using both SCBE T-scores and raw scores ( $p = .40, p = .42$ ), respectively, but significant slopes for girls ( $p < .05, p < .05$ ). This indicated a significant negative relationship between Shyness and SC for only girls when rated by parents.

Gender differences are apparent at both the lower and upper extremes of Shyness when using both T-scores and raw scores, though larger differences appear at the lower extreme of Shyness for raw scores and at the upper extreme for T-scores. Higher ratings of Shyness seem to have a more negative effect on SC for girls than boys for both T-scores and raw scores. Parent-rated Shyness and its interaction with gender uniquely accounted for 12% of the variance in participants' SC T-score and 11% of the variance in the SC raw score on the CBQ. There was a significant main effect for parent-rated Shyness using both T-scores ( $F(1, 82) = 5.10, p < .05$ ) and raw scores ( $F(1, 82) = 4.87, p < .05$ ).

*Moderating effects of gender for falling reactivity/soothability.* Interaction effects between Falling Reactivity/Soothability and gender are displayed in Figure 6 and were only

significant for teacher ratings when using both SCBE T-scores ( $F(1, 110) = 8.15, p < .01$ ) and raw scores ( $F(1, 110) = 7.29, p < .01$ ). On the CBQ-T, simple slope analyses yielded significant slopes for both boys ( $p < .001, p < .001$ ) and girls ( $p < .001, p < .001$ ) when using T-scores and raw scores on the SCBE, respectively. This indicated a significant positive relationship between Falling Reactivity/Soothability and SC for both genders when rated by teachers.

The general trend for both boys and girls using both T-scores and raw scores was that higher scores on Falling Reactivity/Soothability predicted higher scores on SC. Gender differences were minimal at the lower extreme of Falling Reactivity/Soothability when using T-scores and the upper extreme for raw scores, though larger differences appear at the lower extreme of Falling Reactivity/Soothability for raw scores and at the upper extreme for T-scores. Falling Reactivity/Soothability appears to be a strong predictor for SC for both boys and girls when rated by teachers. Teacher-rated Falling Reactivity/Soothability and its interaction with gender uniquely accounted for 6% of the variance in participants' SC T-score and 5% of the variance in the SC raw score on the CBQ-T. There was a significant main effect for teacher-rated Falling Reactivity/Soothability using both T-scores ( $F(1, 111) = 26.31, p < .001$ ) and raw scores ( $F(1, 111) = 26.06, p < .001$ ).

*Moderating effects of gender for smiling/laughter.* Interaction effects between Smiling/Laughter and gender (Figure 7) were only significant for teacher ratings when using both SCBE T-scores ( $F(1, 108) = 5.86, p < .01$ ) and raw scores ( $F(1, 108) = 3.95, p < .05$ ). On the CBQ-T, simple slope analyses yielded significant slopes for boys ( $p < .001, p < .001$ ) and girls ( $p < .001, p < .001$ ) when using both T-scores and raw scores on the SCBE, respectively. This indicated a significant positive relationship between Smiling/Laughter and SC for both genders when rated by teachers.

The trend for both genders using T-scores and raw scores was that higher scores on Smiling/Laughter predicted higher scores on SC. Gender differences were minimal at the lower extreme of Smiling/Laughter when using raw scores and the upper extreme for T-scores, though larger differences appear at the lower extreme of Smiling/Laughter for T-scores and at the upper extreme for raw scores. Teacher-rated Smiling/Laughter and its interaction with gender uniquely accounted for 4% of the variance in participants' SC T-score and 3% of the variance in the SC raw score on the CBQ-T. There was a significant main effect for teacher-rated Smiling/Laughter using both T-scores ( $F(1, 109) = 30.61, p < .001$ ) and raw scores ( $F(1, 109) = 29.21, p < .001$ ).

*Moderating effects of gender for anger/frustration.* Anger/Frustration significantly interacted with gender for parent ratings, though only when using SCBE raw scores ( $F(1, 83) = 3.86, p < .05$ ; Figure 8). On the CBQ, simple slope analyses indicated nonsignificant slopes for both boys ( $p = .57$ ) and girls ( $p = .37$ ) when using raw scores on the SCBE. The direction of the correlations varied with gender, and more parent-rated anger was associated with lower SC for girls, but higher SC for boys. There was a larger gender difference at the lower extreme of Anger/Frustration compared to the upper extreme. Parent-rated Anger/Frustration and its interaction with gender uniquely accounted for 4% of the variance in the SC raw score on the CBQ.

*Moderating effects of gender for attentional focusing.* Figure 9 displays the significant interaction between Attentional Focusing and gender, though this only emerged for SCBE raw scores and parent ratings ( $F(1, 84) = 4.71, p < .05$ ). Simple slope analyses yielded nonsignificant slopes for boys ( $p = .40$ ) and girls ( $p = .56$ ) on the CBQ when using raw scores on the SCBE. There was a larger gender difference at the lower end of Attentional Focusing and differences between boys and girls lessened at the higher end. In general, girls are higher in SC at both the

lower and higher extreme of Attentional Focusing. Low attention capacity is associated with lower SC for boys than girls. Parent-rated Attentional Focusing and its interaction with gender uniquely accounted for 5% of the variance in the SC raw score on the CBQ.

*Moderating effects of gender for perceptual sensitivity.* Figure 10 displays the significant interaction between Perceptual Sensitivity and gender, though an interaction only emerged for SCBE raw scores and CBQ parent ratings ( $F(1, 78) = 5.01, p < .05$ ). On the CBQ, simple slope analyses indicated nonsignificant slopes for both boys ( $p = .74$ ) and girls ( $p = .59$ ) when using raw scores on the SCBE. There was a slightly larger gender difference at the upper end of Perceptual Sensitivity and differences between boys and girls lessened at the lower end. In general, girls are higher in SC at both the lower and higher extreme of Perceptual Sensitivity. Low Perceptual Sensitivity is associated with slightly lower SC for boys compared to girls with similarly low Perceptual Sensitivity. Parent-rated Perceptual Sensitivity and its interaction with gender uniquely accounted for 6% of the variance in the SC raw score on the CBQ.

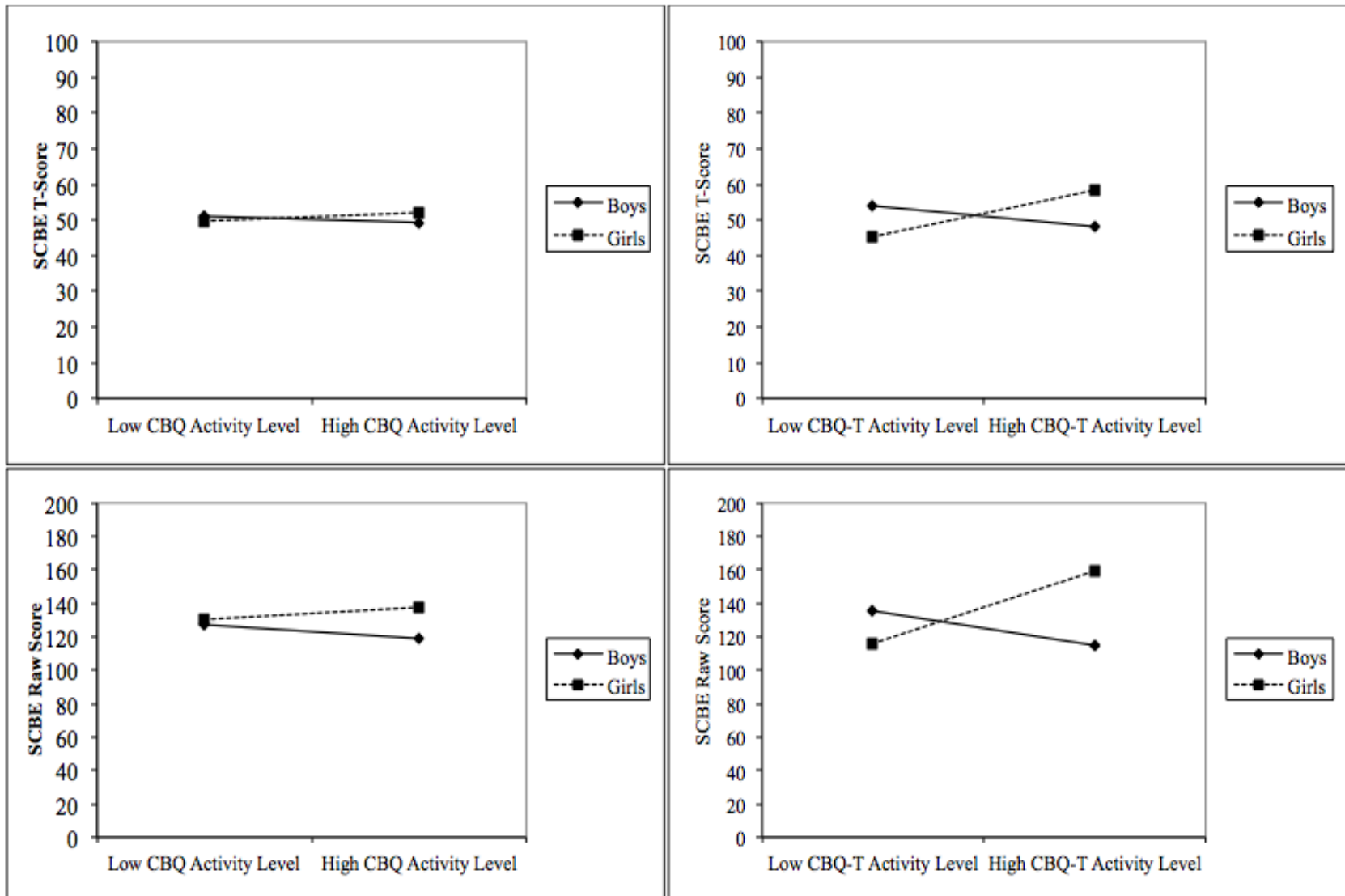


Figure 1.

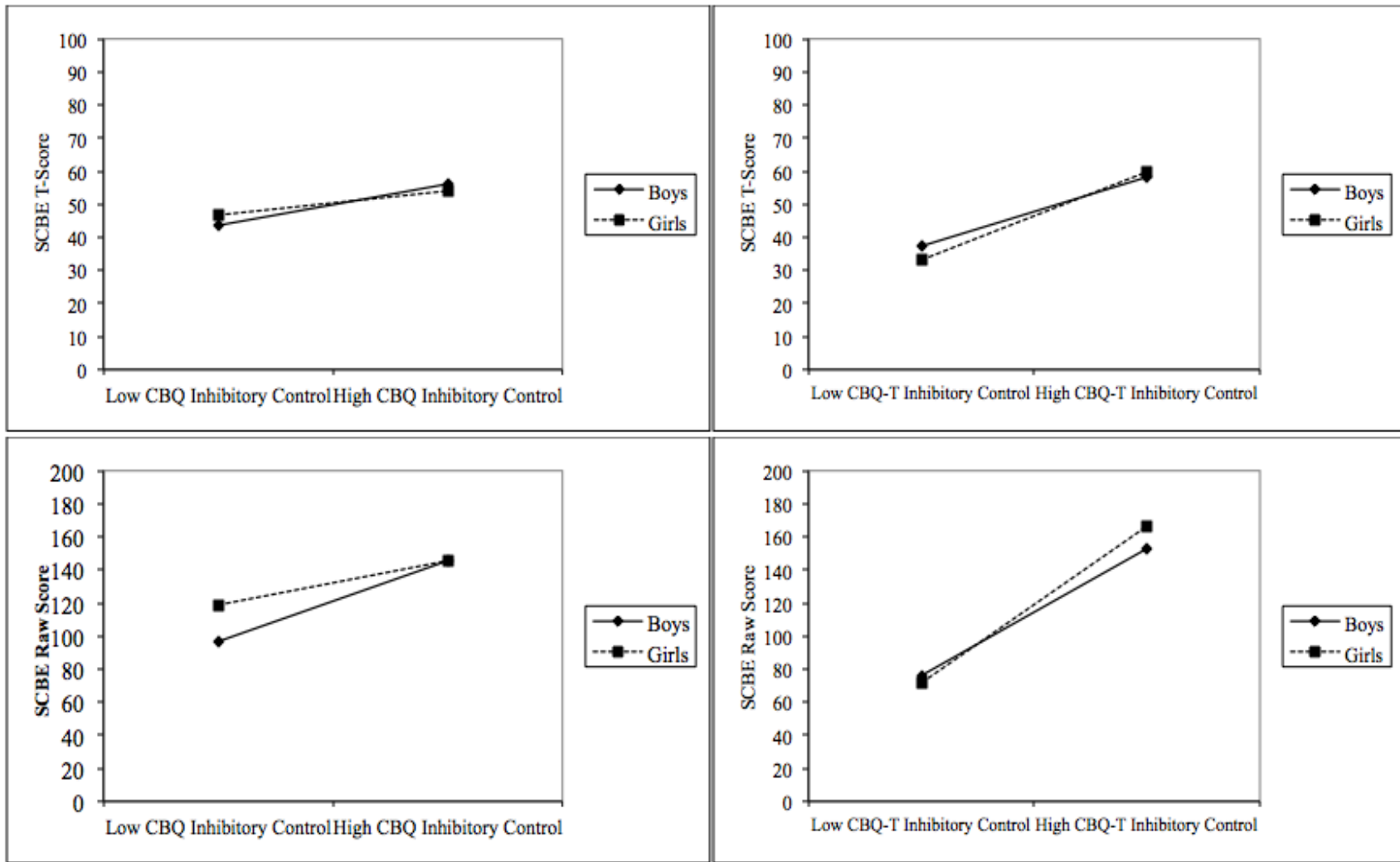


Figure 2.

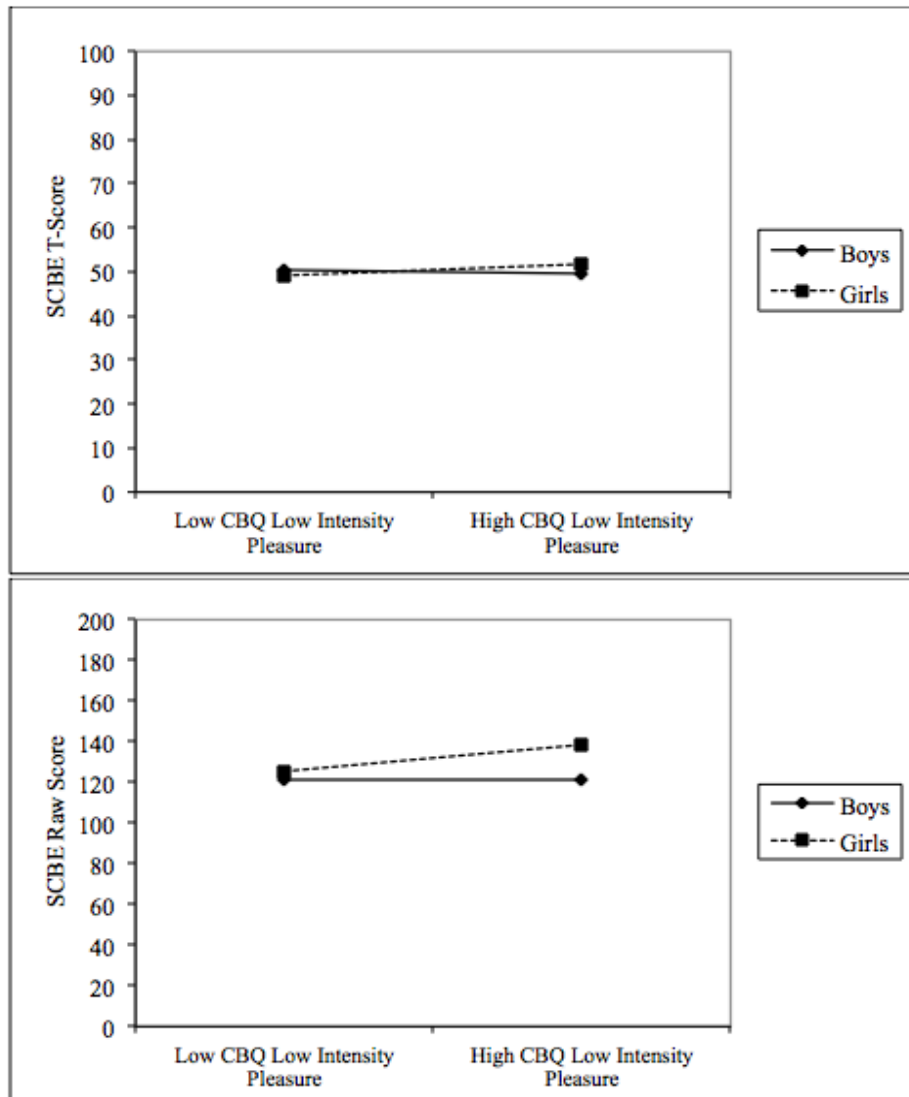


Figure 3.

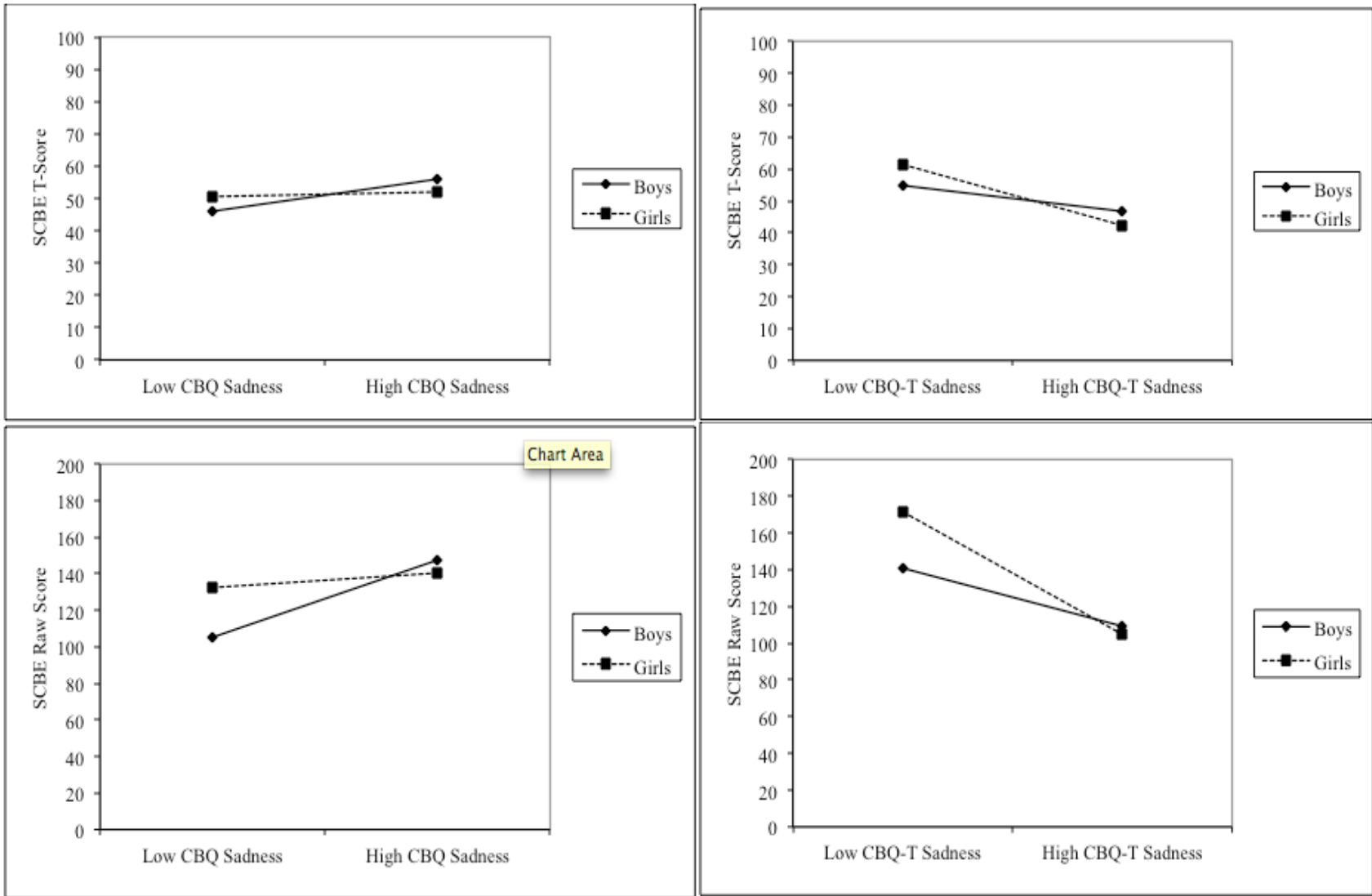


Figure 4.



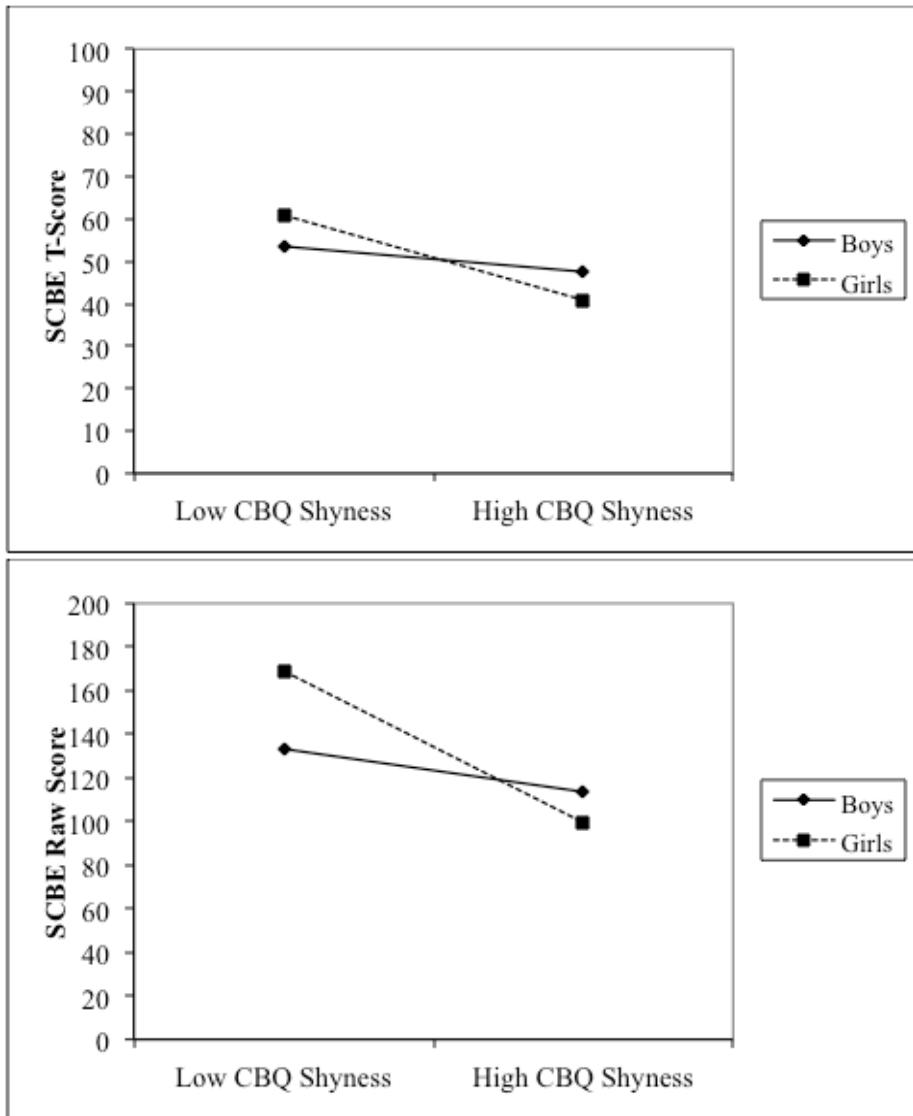


Figure 5.

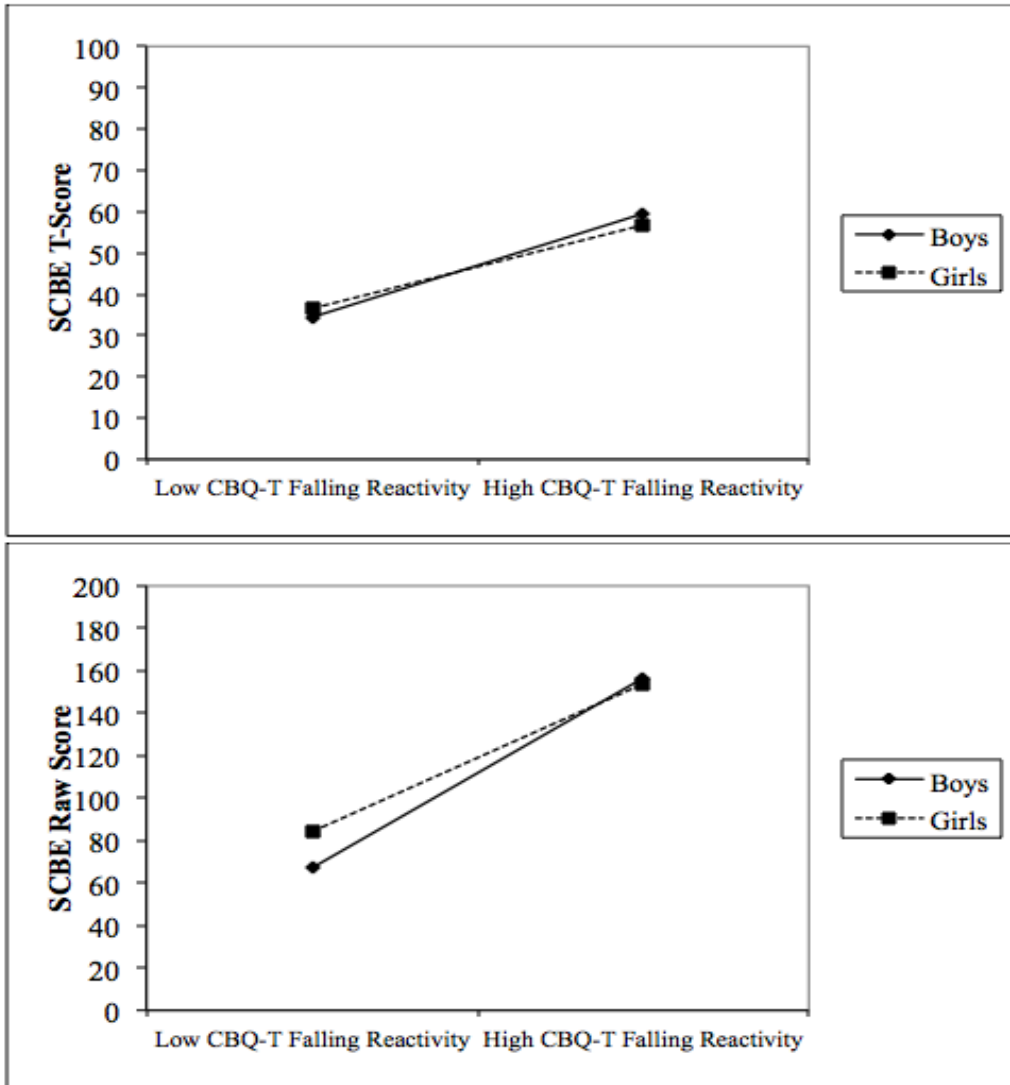


Figure 6.

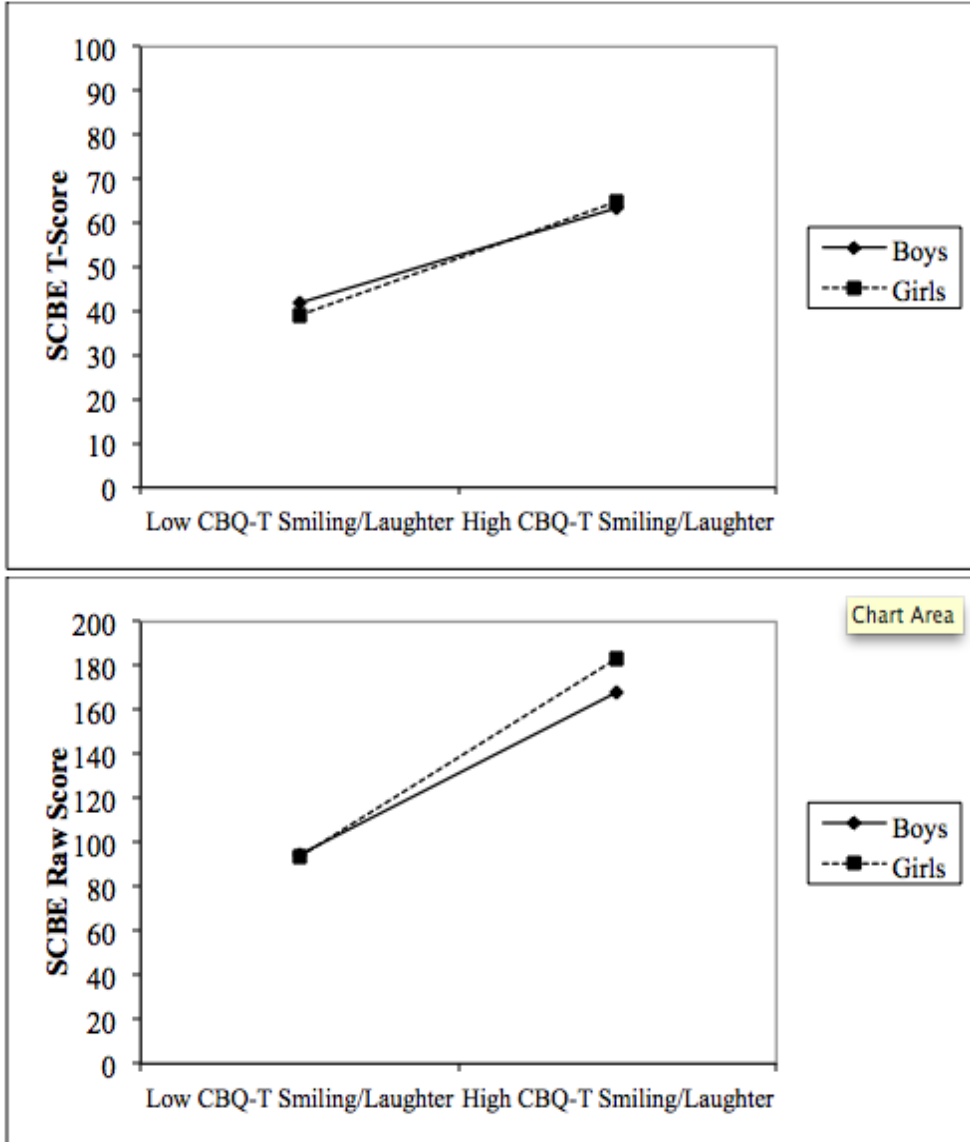


Figure 7.

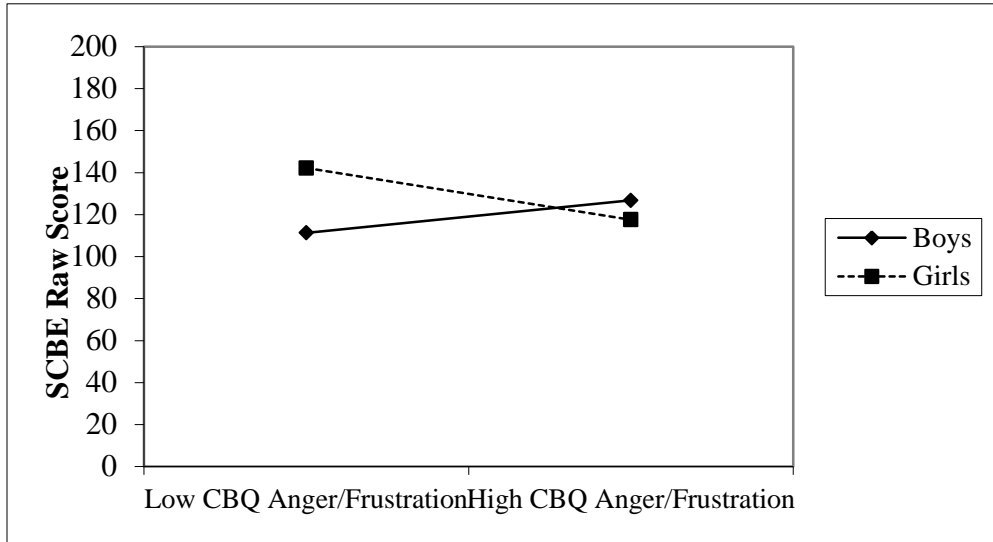


Figure 8.

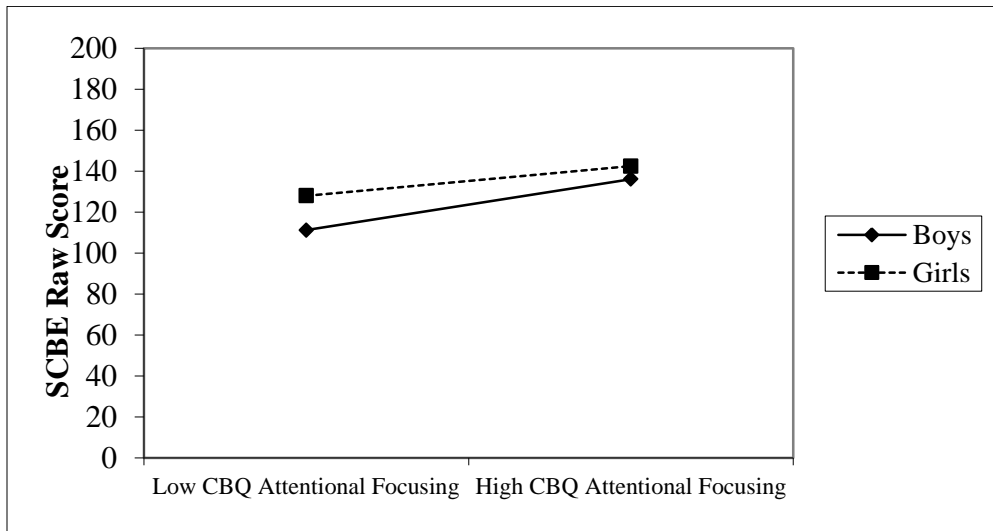


Figure 9.

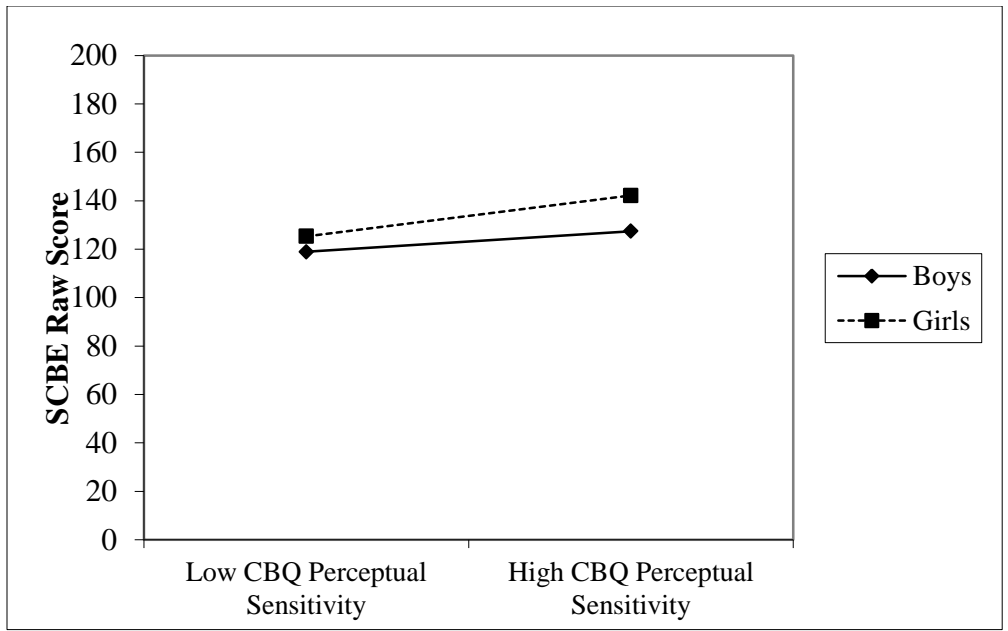


Figure 10.

Table 25

*Summary of Linear Regression Analyses for CBQ Activity Level Predicting Social Competence (T-Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.02	.08	-.02	-.25	.85
Gender	.48	1.76	.03	.27	.79
Model 2					
Age in Months	-.02	.08	-.02	-.25	.85
Gender	.50	1.81	.03	.28	.78
CBQ Activity Level	.06	1.07	.01	.06	.96
Model 3					
Age in Months	-.07	.09	-.09	-.80	.43
Gender	22.54	10.79	1.38	2.09	.04*
CBQ Activity Level	7.29	3.65	.75	2.00	.05*
CBQ Activity Level x Gender	-4.58	2.21	-1.41	-2.07	.04*

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 26

*Summary of Linear Regression Analyses for CBQ Inhibitory Control Predicting Social Competence (T-Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.02	.09	-.02	-.22	.85
Gender	.48	1.81	.03	.27	.79
Model 2					
Age in Months	-.02	.08	-.02	-.25	.85
Gender	.43	1.78	.03	.24	.81
CBQ Inhibitory Control	2.01	1.06	.21	1.90	.06
Model 3					
Age in Months	-.05	.08	-.07	-.63	.52
Gender	34.95	9.85	2.13	3.55	.00**
CBQ Inhibitory Control	12.49	3.11	1.28	4.02	.00**
CBQ Inhibitory Control x Gender	-7.09	1.99	-2.41	-3.56	.00**

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 27

*Summary of Linear Regression Analyses for CBQ Low Intensity Pleasure Predicting Social Competence (T-Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.02	.09	-.02	-.22	.85
Gender	.48	1.80	.03	.27	.79
Model 2					
Age in Months	-.02	.09	-.02	-.22	.88
Gender	.46	1.83	.03	.25	.80
CBQ Low Intensity Pleasure	.20	1.46	.02	.14	.89
Model 3					
Age in Months	-.22	.08	-.28	-2.75	.01**
Gender	93.06	15.33	5.68	6.07	.00**
CBQ Low Intensity Pleasure	22.17	3.82	1.75	5.80	.00**
CBQ Low Intensity Pleasure x Gender	-15.76	2.59	-6.11	-6.08	.00**

*Notes.* \* $p < .05$ . \*\* $p < .01$ .



Table 28

*Summary of Linear Regression Analyses for CBQ Sadness Predicting Social Competence (T-Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.02	.09	-.02	-.22	.86
Gender	.48	1.97	.03	.24	.81
Model 2					
Age in Months	-.04	.10	-.05	-.40	.71
Gender	.36	1.98	.02	.18	.86
CBQ Sadness	.99	1.09	.11	.91	.37
Model 3					
Age in Months	.01	.09	.01	.11	.93
Gender	28.31	8.81	1.73	3.21	.00**
CBQ Sadness	10.93	3.23	1.24	3.38	.00**
CBQ Sadness x Gender	-6.58	2.03	-2.15	-3.24	.00**

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 29

*Summary of Linear Regression Analyses for CBQ Shyness Predicting Social Competence (T-Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.02	.08	-.02	-.25	.85
Gender	.48	1.80	.03	.27	.79
Model 2					
Age in Months	-.02	.08	-.03	-.25	.82
Gender	.61	1.76	.04	.35	.73
CBQ Shyness	-1.49	.66	-.24	-2.26	.03*
Model 3					
Age in Months	-.07	.08	-.09	-.88	.40
Gender	16.73	4.91	1.02	3.41	.00**
CBQ Shyness	4.88	1.93	.80	2.53	.01**
CBQ Shyness x Gender	-4.47	1.28	-1.50	-3.49	.00**

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 30

*Summary of Linear Regression Analyses for CBQ-T Activity Level Predicting Social Competence (T-Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.02	.07	-.02	-.29	.83
Gender	.48	1.54	.03	.31	.76
Model 2					
Age in Months	-.03	.08	-.03	-.38	.74
Gender	.70	1.66	.04	.42	.67
CBQ-T Activity Level	.24	.63	.04	.38	.71
Model 3					
Age in Months	-.01	.08	-.01	-.13	.91
Gender	-9.29	5.21	-.57	-1.78	.08
CBQ-T Activity Level	-3.23	1.83	-.55	-1.77	.08
CBQ-T Activity Level x Gender	2.42	1.20	.71	2.02	.05*

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 31

*Summary of Linear Regression Analyses for CBQ-T Falling Reactivity/Soothability Predicting Social Competence (T-Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.02	.07	-.02	-.29	.83
Gender	.48	1.54	.03	.31	.76
Model 2					
Age in Months	.05	.07	.06	.71	.50
Gender	-.53	1.41	-.03	-.38	.71
CBQ-T Falling Reactivity/Soothability	3.27	.64	.45	5.11	.00**
Model 3					
Age in Months	.07	.07	.09	1.00	.29
Gender	15.60	5.81	.95	2.69	.01**
CBQ-T Falling Reactivity/Soothability	8.95	2.08	1.23	4.30	.00**
CBQ-T Falling Reactivity/Soothability x Gender	-3.55	1.25	-1.35	-2.84	.01**

*Notes.* \**p* < .05. \*\**p* < .01.

Table 32

*Summary of Linear Regression Analyses for CBQ-T Inhibitory Control Predicting Social Competence (T-Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.02	.08	-.02	-.25	.84
Gender	.48	1.68	.03	.29	.78
Model 2					
Age in Months	.04	.07	.05	.57	.60
Gender	-1.28	1.54	-.08	-.83	.41
CBQ-T Inhibitory Control	3.50	.70	.48	5.00	.00**
Model 3					
Age in Months	.06	.07	.08	.86	.39
Gender	21.15	6.72	1.29	3.15	.00**
CBQ-T Inhibitory Control	9.94	2.00	1.35	4.97	.00**
CBQ-T Inhibitory Control x Gender	-4.63	1.35	-1.81	-3.43	.00**

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 33

*Summary of Linear Regression Analyses for CBQ-T Sadness Predicting Social Competence (T-Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.02	.08	-.02	-.25	.86
Gender	.48	1.90	.03	.25	.80
Model 2					
Age in Months	-.03	.08	-.04	-.38	.75
Gender	1.00	1.87	.06	.53	.59
CBQ-T Sadness	-2.20	.97	-.26	-2.27	.03**
Model 3					
Age in Months	-.09	.05	-.12	-1.8	.07
Gender	56.17	4.50	3.43	12.48	.00**
CBQ-T Sadness	17.54	1.66	2.07	10.57	.00**
CBQ-T Sadness x Gender	-13.93	1.11	-4.40	-12.55	.00**

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 34

*Summary of Linear Regression Analyses for CBQ-T Smiling/Laughter Predicting Social Competence (T-Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.02	.07	-.02	-.29	.83
Gender	.48	1.56	.03	.31	.76
Model 2					
Age in Months	-.05	.07	-.06	-.71	.46
Gender	-.54	1.40	-.03	-.39	.70
CBQ-T Smiling/Laughter	3.65	.66	.47	5.53	.00**
Model 3					
Age in Months	-.04	.06	-.05	-.67	.58
Gender	16.74	7.27	1.02	2.30	.02*
CBQ-T Smiling/Laughter	8.15	1.97	1.06	4.14	.00**
CBQ-T Smiling/Laughter x Gender	-3.16	1.31	-1.29	-2.41	.02*

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 35

*Summary of Linear Regression Analyses for CBQ Activity Level Predicting Social Competence (Raw Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.09	.29	-.03	-.31	.76
Gender	10.97	6.14	.19	1.79	.08
Model 2					
Age in Months	-.09	.29	-.03	-.31	.76
Gender	11.02	6.32	.19	1.74	.09
CBQ Activity Level	.15	3.76	.00	.04	.97
Model 3					
Age in Months	-.26	.30	-.10	-.87	.38
Gender	86.01	37.83	1.47	2.27	.03*
CBQ Activity Level	24.75	12.79	.71	1.94	.06
CBQ Activity Level x Gender	-15.58	7.76	-1.35	-2.00	.05*

*Notes.* \* $p < .05$ . \*\* $p < .01$ .



Table 36

*Summary of Linear Regression Analyses for CBQ Anger/Frustration Predicting Social Competence (Raw Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.09	.29	-.03	-.31	.77
Gender	10.97	6.22	.19	1.76	.08
Model 2					
Age in Months	-.08	.29	-.03	-.28	.78
Gender	10.97	6.25	.19	1.76	.08
CBQ Anger/Frustration	-.62	2.69	-.03	-.23	.82
Model 3					
Age in Months	-.13	.29	-.05	-.45	.65
Gender	55.67	23.57	.95	2.36	.02*
CBQ Anger/Frustration	15.32	8.54	.61	1.79	.08
CBQ Anger/Frustration x Gender	-10.61	5.40	-1.02	-1.96	.05*

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 37

*Summary of Linear Regression Analyses for CBQ Attentional Focusing Predicting Social Competence (Raw Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.09	.29	-.03	-.31	.76
Gender	10.97	6.18	.19	1.78	.08
Model 2					
Age in Months	-.12	.29	-.04	-.41	.69
Gender	11.52	6.20	.20	1.86	.07
CBQ Attentional Focusing	3.16	3.18	.11	.99	.32
Model 3					
Age in Months	-.37	.31	-.13	-1.19	.24
Gender	88.86	36.13	1.52	2.46	.02*
CBQ Attentional Focusing	27.02	11.42	.91	2.37	.02*
CBQ Attentional Focusing x Gender	-14.74	6.79	-1.51	-2.17	.03*

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 38

*Summary of Linear Regression Analyses for CBQ Inhibitory Control Predicting Social Competence (Raw Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.09	.29	-.03	-.31	.77
Gender	10.97	6.33	.19	1.73	.09
Model 2					
Age in Months	-.09	.29	-.03	-.31	.77
Gender	10.76	6.21	.19	1.73	.09
CBQ Inhibitory Control	7.60	3.70	.22	2.05	.04*
Model 3					
Age in Months	-.22	.27	-.08	-.81	.41
Gender	143.94	33.73	2.47	4.27	.00**
CBQ Inhibitory Control	48.01	10.65	1.38	4.51	.00**
CBQ Inhibitory Control x Gender	-27.33	6.82	-2.61	-4.01	.00**

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 39

*Summary of Linear Regression Analyses for CBQ Low Intensity Pleasure Predicting Social Competence (Raw Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.09	.30	-.03	-.30	.77
Gender	10.97	6.33	.19	1.73	.09
Model 2					
Age in Months	-.06	.31	-.02	-.19	.84
Gender	10.78	6.39	.19	1.69	.10
CBQ Low Intensity Pleasure	1.58	5.11	.04	.31	.76
Model 3					
Age in Months	-.83	.27	-.30	-3.07	.00**
Gender	360.17	51.56	6.17	6.99	.00**
CBQ Low Intensity Pleasure	84.49	12.84	1.87	6.58	.00**
CBQ Low Intensity Pleasure x Gender	-59.45	8.73	-6.47	-6.81	.00**

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 40

*Summary of Linear Regression Analyses for CBQ Perceptual Sensitivity Predicting Social Competence (Raw Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.09	.30	-.03	-.30	.77
Gender	10.97	6.41	.19	1.71	.09
Model 2					
Age in Months	-.10	.30	-.04	-.33	.75
Gender	10.55	6.47	.18	1.63	.11
CBQ Perceptual Sensitivity	2.19	3.61	.07	.61	.55
Model 3					
Age in Months	-.41	.33	-.15	-1.24	.21
Gender	109.69	44.72	1.88	2.45	.02*
CBQ Perceptual Sensitivity	27.44	11.82	.84	2.32	.02*
CBQ Perceptual Sensitivity x Gender	-17.86	7.98	-1.96	-2.24	.03*

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 41

*Summary of Linear Regression Analyses for CBQ Sadness Predicting Social Competence (Raw Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.09	.32	-.03	-.28	.79
Gender	10.97	6.90	.19	1.59	.12
Model 2					
Age in Months	-.17	.33	-.06	-.52	.60
Gender	10.41	6.90	.18	1.51	.14
CBQ Sadness	4.42	3.80	.14	1.16	.25
Model 3					
Age in Months	.01	.30	.00	.03	.98
Gender	128.20	29.59	2.20	4.33	.00**
CBQ Sadness	46.32	10.84	1.48	4.27	.00**
CBQ Sadness x Gender	-27.74	6.81	-2.54	-4.07	.00**

Notes. \* $p < .05$ . \*\* $p < .01$ .

Table 42

*Summary of Linear Regression Analyses for CBQ Shyness Predicting Social Competence (Raw Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.09	.29	-.03	-.31	.77
Gender	10.97	6.29	.19	1.74	.09
Model 2					
Age in Months	-.09	.29	-.03	-.31	.74
Gender	11.43	6.15	.20	1.86	.07
CBQ Shyness	-5.09	2.31	-.23	-2.20	.03*
Model 3					
Age in Months	-.26	.28	-.10	-.93	.35
Gender	66.17	17.29	1.13	3.83	.00**
CBQ Shyness	16.54	6.80	.76	2.43	.02*
CBQ Shyness x Gender	-15.18	4.52	-1.43	-3.36	.00**

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 43

*Summary of Linear Regression Analyses for CBQ-T Activity Level Predicting Social Competence (Raw Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.09	.25	-.03	-.36	.73
Gender	10.97	5.39	.19	2.04	.04*
Model 2					
Age in Months	-.12	.27	-.04	-.44	.66
Gender	11.64	5.80	.20	2.01	.05*
CBQ-T Activity Level	.72	2.22	.03	.32	.75
Model 3					
Age in Months	-.06	.27	-.02	-.22	.83
Gender	-23.44	18.23	-.40	-1.29	.20
CBQ-T Activity Level	-11.45	6.39	-.54	-1.79	.08
CBQ-T Activity Level x Gender	8.49	4.19	.70	2.03	.05*

*Notes.* \* $p < .05$ . \*\* $p < .01$ .



Table 44

*Summary of Linear Regression Analyses for CBQ-T Falling Reactivity/Soothability Predicting Social Competence (Raw Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.09	.25	-.03	-.36	.73
Gender	10.97	5.41	.19	2.03	.05*
Model 2					
Age in Months	.13	.23	.05	.57	.59
Gender	7.45	4.94	.13	1.51	.14
CBQ-T Falling Reactivity/Soothability	11.40	2.23	.44	5.11	.00**
Model 3					
Age in Months	.21	.23	.08	.91	.37
Gender	61.08	20.44	1.05	2.99	.00**
CBQ-T Falling Reactivity/Soothability	30.28	7.32	1.17	4.14	.00**
CBQ-T Falling Reactivity/Soothability x Gender	-11.82	4.38	-1.27	-2.70	.01**

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 45

*Summary of Linear Regression Analyses for CBQ-T Inhibitory Control Predicting Social Competence (Raw Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.09	.28	-.03	-.32	.75
Gender	10.97	5.88	.19	1.87	.07
Model 2					
Age in Months	.10	.25	.04	.40	.69
Gender	4.74	5.38	.08	.88	.38
CBQ-T Inhibitory Control	12.38	2.44	.47	5.07	.00**
Model 3					
Age in Months	.18	.23	.07	.78	.44
Gender	89.81	23.17	1.54	3.88	.00**
CBQ-T Inhibitory Control	36.83	6.89	1.41	5.35	.00**
CBQ-T Inhibitory Control x Gender	-17.55	4.67	-1.92	-3.76	.00**

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 46

*Summary of Linear Regression Analyses for CBQ-T Sadness Predicting Social Competence (Raw Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.09	.31	-.03	-.29	.78
Gender	10.97	6.66	.19	1.65	.10
Model 2					
Age in Months	-.13	.30	-.05	-.43	.67
Gender	12.84	6.51	.22	1.97	.05*
CBQ-T Sadness	-7.95	3.38	-.26	-2.35	.02*
Model 3					
Age in Months	-.35	.17	-.13	-2.06	.04
Gender	207.79	15.31	3.56	13.57	.00**
CBQ-T Sadness	61.79	5.64	2.05	10.96	.00**
CBQ-T Sadness x Gender	-49.21	3.76	-4.36	-13.09	.00**

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

Table 47

*Summary of Linear Regression Analyses for CBQ-T Smiling/Laughter Predicting Social Competence (Raw Score)*

Variables	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i> -value
Model 1					
Age in Months	-.09	.26	-.03	-.35	.73
Gender	10.97	5.46	.19	2.01	.05*
Model 2					
Age in Months	-.20	.23	-.07	-.87	.39
Gender	7.45	4.92	.13	1.51	.13
CBQ-T Smiling/Laughter	12.55	2.32	.46	5.41	.00**
Model 3					
Age in Months	-.16	.23	-.06	-.70	.48
Gender	57.79	25.79	.99	2.24	.03*
CBQ-T Smiling/Laughter	25.65	6.98	.94	3.67	.00**
CBQ-T Smiling/Laughter x Gender	-9.20	4.63	-1.05	-1.99	.05*

*Notes.* \* $p < .05$ . \*\* $p < .01$ .

## Chapter 5: Discussion

Several studies that have investigated gender differences in temperament and SC reveal that there are, in fact, differences between boys and girls on many temperament and SC measures, though there are gaps in our understanding of where such differences lie and whether it varies by rater. Standard deviations are routinely reported by gender in studies, but there were none found that investigated significant differences in variability between groups. Also, standard deviations of gender groups may be similar, but there are questions as to whether the distribution is skewed differently for boys and girls. None of the studies reviewed in Chapter 2 analyzed standard deviations and skewness of the distributions so as to understand the potential distributional differences for boys and girls. One primary purpose of the current work was to add to the literature by investigating where gender differences lie in a distribution and whether it differs by rater source (also see Appendices C and D).

Secondly, this study sought to compare gender differences in social competence using both standardized T-scores that have been normed separately for each gender and raw scores. Several measures of SC use transformed standardized scores, and consequently, raw scores may differ between genders despite similar standard scores and what constitutes average scores may be different for girls and boys. Overall, in previous studies of SC, standardized and raw scores were used to compare gender groups and gender differences were more likely to be reported when raw scores were used compared to standardized scores.

Finally, this study sought to supplement the literature regarding how temperament relates to external correlates, such as social competence, and whether gender serves as a moderator in these relations. This study also uniquely considered rater source and the use of standardized scores versus raw scores and how they influence gender's moderation of temperament relations

with SC. No study found examined differences when raw versus standard scores are used and the majority of the studies reported the gender-normed scores. The present study also adds to the literature because it investigated both parent- and teacher-rated temperament and its relations to teacher-rated SC. Information from both informants provided the opportunity to compare gender differences for parent- and teacher-rated temperament and their relations with teacher-rated SC.

Overall, the current study sought to: a) investigate distributional differences of temperament between genders, regardless of mean differences, in two ways—within rater and comparing between parent and teacher raters; b) investigate distributional differences of SC between genders; c) examine how the use of raw scores versus standardized gender-normed scores influence distributional properties of SC; d) examine where gender differences are located in the distribution (e.g., in the middle or at the extremes) of temperament (parent- and teacher-rated) and SC; e) investigate the relations between temperament and SC using both raw and standardized SC scores and parent- and teacher-rated temperament for each gender; and f) examine whether gender moderates the relationship between temperament and SC with consideration of rater and type of score (raw versus T-scores).

### **Gender Differences in Temperament By Rater**

Because low rater agreement is common (De Los Reyes & Kazdin, 2005), analyses were conducted separately for parent and teacher informants on the CBQ and CBQ-T in order to compare gender differences between raters and understand the tendencies of informants. For boys, 7 of 15 scales were significantly higher for parent raters compared to teacher raters, several of which yielded moderate to very large effect sizes. Low Intensity Pleasure ( $d = 1.61$ ), Perceptual Sensitivity ( $d = .76$ ), and Smiling/Laughter ( $d = .70$ ) had the largest effect sizes. Similarly, for girls, 6 of 15 scales were significantly higher for parent raters compared to

teachers and several scales yielded moderate to large effect sizes. The scales of Low Intensity Pleasure ( $d = 1.13$ ) and High Intensity Pleasure ( $d = .92$ ) had the largest effect sizes. Low Intensity Pleasure and Smiling/Laughter were found to have significant mean differences between raters for both genders, suggesting that the characteristics and behaviors that fall under these scales present differently across contexts for boys and girls. These findings imply that parent-teacher rater agreement is low on several dimensions of temperament and holds true for both boys and girls (see Tables 48 and 49).

On the particular temperament scales on which parents significantly differed from teachers, parents tended to rate boys more favorably than teachers. However, for girls, parents differed from teachers on a similar number of “favorable” versus “unfavorable” traits. Specifically, for boys, 5 scales were favorable and 2 were unfavorable (i.e., Fear and Sadness), whereas, for girls, 3 were favorable and 3 were unfavorable.

Teachers rated boys higher on Activity Level than parents, and parents rated girls higher on Activity Level than teachers. On Inhibitory Control, Low Intensity Pleasure, Perceptual Sensitivity, and Sadness, parents rated boys higher than teachers. These findings may be attributed to the fact that teachers have more normative reference points with a classroom of students, and perhaps, more experience in identifying typical behavior in children. It is also possible that girls may be better suited for the preschool classroom environment and regulate their activity level better than boys as part of the teacher’s expectations, though in the home setting, they are more likely to be active without the same type of rules and expectations of a classroom. Since girls have higher Inhibitory Control and EC in general, it may be that they exert more control to moderate their behavior in the classroom than at home, which helps explain informant discrepancies between parents and teachers.

Parents rated girls higher than teachers on Anger/Frustration and Approach/Positive Anticipation. These findings imply that girls may be more different than boys in their behaviors across contexts. Girls seem less willing to express anger or positive anticipation in the classroom compared to the home. On Smiling/Laughter, parents rated higher than teachers for both genders. It is unclear whether this finding stems from an accurate reflection of a child's behaviors in that children are more likely to express joy by laughing and smiling when at home compared to when they are at school, or whether it is due to rater bias. It is not surprising that parents tend to rate their own child more positively than other rater sources, producing a halo effect (Nisbett & Wilson, 1977).

**Gender differences in variability.** For boys, significant differences in variability were found between parent and teacher raters on four scales compared to five for girls. Activity Level and Smiling/Laughter had significantly larger standard deviations when rated by teachers for both boys and girls suggesting that teachers tend to see a wider range of behaviors in the classroom that fall under these two temperament dimensions. Interestingly, Fear yielded a wider range for both boys and girls on parent ratings, which suggests that teachers have more difficulty accurately rating fearful behaviors and tend to rate closer to the mean. This is in comparison to parents who are more attuned raters of this behavior and are more likely to observe children in situations that may evoke fear. Boys, but not girls, were rated with significantly more variability on High Intensity Pleasure by teachers compared to parents suggesting that teachers observe a wider continuum of high intensity behaviors from boys in the classroom. Falling Reactivity/Soothability and Low Intensity Pleasure yielded significantly more variability for girls, but not boys, when rated by teachers suggesting that girls exhibit a larger repertoire of behaviors that fall under these dimensions compared to boys in the classroom.



Table 48

*Patterns of Findings for Boys and Girls on the CBQ and CBQ-T by Rater*

Scale	Boys				Girls			
	CBQ		CBQ-T		CBQ		CBQ-T	
	Higher <i>M</i> / Larger <i>SD</i>		Higher <i>M</i> / Larger <i>SD</i>		Higher <i>M</i> / Larger <i>SD</i>		Higher <i>M</i> / Larger <i>SD</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>
Activity Level				x***	x***			x***
Anger/Frustration					x***			x*
Approach/Positive Anticipation				x*	x***			
Attentional Focusing								
Discomfort								
Falling Reactivity/Soothability	x**							x***
Fear	x**	x***				x**		
High Intensity Pleasure				x***	x***			
Impulsivity								
Inhibitory Control	x**							x*
Low Intensity Pleasure	x***				x***			x**
Perceptual Sensitivity	x***							
Sadness	x**							
Shyness								
Smiling & Laughter	x***			x***	x***			x***
Total Significant (Approaching Significance)	7	1	0	3 (1)	6	1	0	4 (2)

Notes. \* $p < .10$ . \*\* $p < .05$ . \*\*\* $p < .01$ .

## **Comparing Informants on the Patterns of Gender Differences**

Parents and teachers have different perspectives, but when comparing their ratings of boys and girls on the same temperament variables, it allows for an understanding of how boys and girls are either viewed differently or present differently within the home context.

**Parent raters.** Parent-rated gender differences replicated previous findings in that parents rated boys significantly higher on one scale, Activity Level, and rated girls as significantly higher than boys on one scale, Discomfort, both of which had medium effect sizes. Activity Level has commonly been found to be higher for boys when rated by parents, though with a small effect size (Else-Quest et al., 2006; Gagne et al., 2013; Gleason et al., 2005; Komsis et al., 2006). Discomfort is the only scale on the factor of Negative Affectivity that has been found to have a gender difference and, like the current study, girls tend to be rated higher than boys.

**Teacher raters.** Overall, the hypothesis that teachers would be more likely to differ in their ratings of boys and girls compared to parents was supported. The current study found a greater number of significant gender differences and with larger effect sizes for teacher raters than for parents. Meta-analyses have found that measures completed by parents are less likely to show gender differences than measures completed by teachers (Else-Quest et al., 2006), and that teachers' ratings tend to yield larger effect sizes than parents' ratings. In the current study, teachers rated boys significantly higher than girls on three scales, including Activity Level, High Intensity Pleasure, and Impulsivity, all of which are scales on the factor of Extraversion/Surgency. Activity Level, High Intensity Pleasure, and Impulsivity are traits that are commonly found to be higher for boys compared to girls and the current study yielded

moderate to large effect sizes. These scales were also significantly more variable for boys compared to girls, except for Activity Level, which was approaching significance.

When comparing gender differences within parent and teacher raters, Activity Level was higher for both informants for boys. Interestingly, Activity Level was the only temperament variable that yielded significant gender differences within both parent and teacher informants with boys rated higher by both. Previous literature has shown that, after age 18 months, a male increase is seen for activity level, and at the preschool age, the gender difference for activity level remains (Else-Quest, et al., 2006). Several previous studies have consistently found boys to be rated by teachers to have a higher activity level than girls (Else-Quest, et al., 2006; Gagne et al., 2013; Gleason et al., 2005; Komsı et al., 2006; Martin, Wisenbaker, Baker, and Huttunen, 1997; Mullola et al., 2011; Mullola et al., 2012), enjoy more high intensity activities (Else-Quest, et al., 2006; Gartstein et al., 2010; Komsı et al., 2006; Komsı et al., 2008; Martin, Wisenbaker, Baker, and Huttunen, 1997), and to be more impulsive (Else-Quest et al., 2006; Gleason et al., 2005; Martin, Wisenbaker, Baker, and Huttunen, 1997; Spinrad et al., 2006).

Girls were rated significantly higher than boys on four scales of the CBQ/CBQ-T, including Fear, Inhibitory Control, Low Intensity Pleasure, and Perceptual Sensitivity. The latter three are scales that are typically rated higher for girls by both parent and teacher raters (Booth-LaForce & Oxford, 2008; DeThorne et al., 2011; Gagne et al., 2013; Hanish et al., 2004; Komsı et al., 2006; Komsı et al., 2008; Mullola et al., 2012; Rudasill & Rimm-Kaufamn, 2009), and larger effect sizes have been found for teacher ratings compared to parent ratings for Inhibitory Control (Spinrad et al., 2006).

**Gender differences in variability.** Mean differences were found to be independent of variability differences for parents, though mean differences and variability aligned for teacher

raters. There were more significant differences in variability between genders for teacher informants compared to parents, suggesting that teachers are more likely to attune to temperament traits that may fall in the extremes of a distribution compared to parents. Whenever there were significant differences between means or standard deviations, boys were rated with more variability than girls by both raters (with the exception of Fear when rated by teachers as noted below). A pattern of greater variability in ratings of boys was expected.

*Parent informants.* Parents rated boys with more variability than girls on two scales (Falling Reactivity/Soothability and Perceptual Sensitivity), and three scales were approaching significance with more variability for boys (Low Intensity Pleasure, Shyness, and Smiling/Laughter). Though variability was not reported by authors in previous studies, when this author calculated variability, similar patterns emerged with boys being rated with more variability on Falling Reactivity/Soothability compared to girls (Gleason et al., 2005). However, no significant differences in standard deviations for boys and girls were found on the scale of Perceptual Sensitivity (Komsis et al., 2008).

These five scales that were significant or approaching significance for differences in variability did not yield significant mean differences, suggesting the importance of studying differences in variability in addition to mean differences in order to shed light on rater patterns. These findings also suggest that gender differences, particularly with parent ratings, may be overlooked when only mean differences are considered and it is worthwhile to consider how many boys and girls fall in the upper or lower extremes of the distribution. Boys and girls may be similar on some aspects of temperament when considering how they fall around the mean. However, the outliers, or those outside of one standard deviation from the mean, may be where the true differences between boys and girls lie on dimensions of temperament and tend to be

overlooked in the literature. Answers are needed to explain why a parent or teacher would rate boys and girls with different variability. Is it that boys and girls are actually differentially variable in some aspects of temperament or that some dimensions of temperament are more salient in certain contexts and, thus, the rater is more “tuned-in” and observant toward certain traits in one gender compared to the other?

**Teacher informants.** For teachers, the four scales on the CBQ-T that yielded significant differences in standard deviations between boys and girls also yielded significant mean differences ranging from small to large effect sizes. Teachers rated boys with significantly more variability than girls on Impulsivity and High Intensity Pleasure, which were also scales that yielded significantly higher means for boys. However, teachers rated boys with significantly more variability on Inhibitory Control compared to girls, though girls were rated to have a significantly higher mean. Previous studies have also found Inhibitory Control to be rated higher for girls by teachers with small effect sizes (Booth-LaForce & Oxford, 2008; Gagne et al., 2013; Hanish et al., 2004; Komsis et al., 2006; Mullola et al., 2012; Rudasill & Rimm-Kaufman, 2009), though no significant differences were found in variability when standard deviations were analyzed by this author (Gagne et al., 2013).

For teacher informants, girls had a significantly larger standard deviation than boys on one scale, Fear, which also had a significantly larger mean for girls. Fear was the only scale on which girls were found to be more variable than boys when comparing within rater differences and one study reviewed yielded the same finding (Pesonen et al., 2006). Else-Quest et al. (2006) did not find any scales of Negative Affectivity to yield gender differences, except for Fear which yielded a very small effect size ( $d=-.12$ ). Fear is typically a difficult temperamental trait for teachers to rate due to the fact that the classroom context does not often create fearful situations

and is typically known for routine and structure. Girls had a wider distribution than boys on the scale of Fear suggesting that they are more likely to exhibit behaviors that are viewed as highly fearful or less fearful in the classroom, and boys are more likely to exhibit behavior considered within the norm.

**Where are gender differences found in the distribution?** When considering gender differences, is it that one gender group is overall higher or lower on a trait (e.g., boys are overall more active) or is it that more boys or girls fall at one extreme or the other? Many of the temperamental traits measured in the current study are considered to be risk factors and are associated with maladjustment (or vice versa and are considered protective factors that are associated with adjustment). When considering the distribution of gender differences, as a field, we gain the ability to understand whether a gender group is overall at higher risk of maladjustment or whether, in fact, those children who fall in the extremes of the distribution are more likely to develop lower SC, internalizing problems, or externalizing problems.

The distribution of each temperament variable was examined separately for parents and teachers in order to compare rater differences. For parent ratings, boys and girls were equally distributed on 14 of 15 scales except for Impulsivity on which a significantly larger proportion of girls fell in the lower tertile, proportionately more boys fell in the upper tertile, and boys and girls fell similarly around the mean. Girls are consistently rated to be less impulsive than boys, though the current findings add to the literature by identifying where in the distribution gender differences lay within a scale of temperament that is well-known to yield differences between boys and girls. Proportionately more boys fell in the upper extreme of the distribution, whereas a significantly larger proportion of girls fell in the lower extreme. This suggests differences in the

extremes, and with a larger sample, this could be more closely examined in future studies to further clarify and provide more information regarding the extremes of the distribution.

For teacher ratings, there were more distributional differences between boys and girls compared to parent ratings. More girls fell in the lower tertile and more boys fell in the upper tertile on the scales of Activity Level, High Intensity Pleasure, Impulsivity, which are temperament dimensions that are often rated higher for boys and lower for girls. However, these findings are unique in that they identify where the differences lie on the distribution. Boys are often rated to display a higher activity level, enjoy more high intensity activities, and be more impulsive compared to girls.

Conversely, on the scales of Low Intensity Pleasure and Perceptual Sensitivity, more boys fell in the lower tertile, whereas more girls fell in the upper tertile. Boys have been found to be less likely to enjoy low intensity activities and less sensitive to changes in their environment compared to girls who are often rated to be higher on these temperamental traits.

These results reveal that teachers tended to provide more extreme ratings for boys and girls on particular temperamental traits compared to parents, which could be attributed to the possibility that particular traits are more critical, and thus salient, in the classroom setting compared to the home setting where there are likely less demands. It could also be due to teachers' ability to rate children compared to a wider reference group than most parents. A child who is higher or lower on a temperamental trait may present as more extreme to a teacher who is able to compare the child to several other peers. Previous studies reported mean differences and some discussed smaller or larger standard deviations based on gender, but no previous studies found identified the locus of gender differences within the distribution. The scales that indicated distributional differences were ones that have consistently shown to have gender differences and

have also yielded mean differences. Overall, findings indicated that there were more differences in the extreme tertiles than around the mean as hypothesized. Even when there are no mean differences it may be helpful to consider gender differences at the extremes. It may be that it appears no gender differences exist when inspecting scores around the mean. However, when boys and girls are compared more than 1.5 standard deviation from the mean, gender differences are revealed and shed light on the fact that boys and girls are mostly similar, except they notably differ when considering higher or lower levels of a temperamental trait. Again, future studies should further investigate these patterns by considering more units from the mean.



Table 49

*Patterns of Findings for Boys and Girls on the CBQ and CBQ-T Within Rater*

Scale	Parents (CBQ)				Teachers (CBQ-T)			
	Boys Higher <i>M</i> / Larger <i>SD</i>		Girls Higher <i>M</i> / Larger <i>SD</i>		Boys Higher <i>M</i> / Larger <i>SD</i>		Girls Higher <i>M</i> / Larger <i>SD</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>
Activity Level	x**				x***	x*		
Anger/Frustration								
Approach/Positive Anticipation								
Attentional Focusing								
Discomfort			x**					
Falling Reactivity/Soothability		x***						
Fear							x**	x**
High Intensity Pleasure					x***	x**		
Impulsivity					x**	x**		
Inhibitory Control						x***	x***	
Low Intensity Pleasure		x*					x***	
Perceptual Sensitivity		x**					x***	
Sadness								
Shyness		x*						
Smiling & Laughter		x*						
Total Significant (Approaching Significance)	1	2 (3)	1	0	3	3 (1)	4	1

Notes. \* $p < .10$ . \*\* $p < .05$ . \*\*\* $p < .01$ .

## Comparing Gender Differences in SC

Patterns of findings for SCBE comparing T-scores and raw scores are presented in Table 50. When comparing T-scores between boys and girls, no mean differences were found to be significant. This differs from previous findings of gender differences when comparing T-scores on the SCBE (Butovskaya & Demianovitsch, 2002; Kotler & McMahon, 2002; Kranzelic & Basic, 2008; LaFreniere & Dumas, 1996; Zhang, 2011). No significant differences in variability were found between genders when comparing T-scores.

However, when comparing raw scores, girls were found to have significantly higher means on five of nine scales, including Angry-Tolerant, Aggressive-Calm, Egotistical-Prosocial, Oppositional-Cooperative, and Social Competence, with high scores representing the positive side of the dichotomy. Girls were rated to be significantly more tolerant, calm, prosocial, cooperative, and socially competent than boys when comparing raw scores, which aligns with several previous findings (Bigras & Auxiliadora Dessen, 2002; Coolahan, Fantuzzo, Mendez, & McDermott, 2000; Henricsson & Rydell, 2004; LaFreniere & Dumas, 1995; Sprinrad et al., 2006; Walker, 2005) and prior studies investigating the SCBE (Butovskaya & Demianovitsch, 2002; Kranzelic & Basic, 2008; LaFreniere & Dumas, 1992). Raw scores brought to light significant gender differences that were otherwise obscured when comparing gender groups on standardized T-scores, implying that perhaps considering differential patterns of gender differences based on both raw and transformed scores would add to future work investigating gender.

Boys and girls were found to be rated with similar variability on the SCBE when using either standard or raw scores, and while no scales yielded significant differences in variability, four were approaching significance when raw scores were used, including Angry-Tolerant,

Isolated-Integrated, Aggressive-Calm, Egotistical-Prosocial. Three of these scales that yielded more variability for girls also yielded mean differences with girls rated higher when using raw scores, as previously noted. Girls were rated to be more calm, tolerant, and prosocial than boys and they were rated to show a wider range of behaviors on these scales compared to boys when raw scores were considered.

**Where are gender differences found in the distribution?** When the proportion of boys and girls categorized into tertiles were compared on SCBE T-scores, both genders were distributed evenly on all nine scales. However, when comparing raw scores, boys and girls were distributed differently on three scales. On Depressive-Joyful, proportionately more boys were found to fall around the mean, whereas proportionately more girls were rated to be more joyful, and a similar percentage of boys and girls were rated to exhibit more depressive characteristics. No previous studies found reported a similar pattern that outlined few gender differences between moderate levels and more gender differences in the extremes of depressive and joyful. On Aggressive-Calm, a larger proportion of boys were rated to be more aggressive compared to girls. On Egotistical-Prosocial, proportionately more boys were rated to be more egotistical and a larger percentage of girls were rated to exhibit more prosocial behaviors (the upper tertile). These results add to the current literature on gender differences in social competence in that they shed light on where in the distribution differences exist between boys and girls. Mean differences are commonly found between boys and girls on aggression and prosocial behaviors, but no studies found have inspected how these differences fall out on a normal curve. These findings illustrate that boys tend to fall in the extremes of the distribution on aggression and girls tend to fall in the extreme of prosocial behavior ratings.

Table 50

*Patterns of Findings for Boys and Girls on the SCBE Comparing T-Scores and Raw Scores*

Scale	T-Scores				Raw Scores			
	Boys Higher <i>M</i> / Larger <i>SD</i>		Girls Higher <i>M</i> / Larger <i>SD</i>		Boys Higher <i>M</i> / Larger <i>SD</i>		Girls Higher <i>M</i> / Larger <i>SD</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>
Depressive-Joyful								
Anxious-Secure								
Angry-Tolerant							x**	x*
Isolated-Integrated								x*
Aggressive-Calm							x***	x*
Egotistical-Prosocial							x***	x*
Oppositional-Cooperative							x**	
Dependent-Autonomous								
Social Competence							x**	
Total Significant (Approaching Significance)	0	0	0	0	0	0	5	0 (4)

Notes. \* $p < .10$ . \*\* $p < .05$ . \*\*\* $p < .01$ .

## **Gender Specific Relations with External Correlates**

As outlined in this study, it is clear that there are varying patterns in gender differences for temperament and SC when considering informants and raw versus T-scores. There is a need to consider relations of temperament to other constructs separately for boys and girls and for both parent and teacher informants. A separate goal of the current study was to elucidate gender differences in temperament's relations with external correlates, specifically social competence. Temperament functions differently for boys and girls and, therefore, must be investigated differently in order to better understand how temperament affects development and SC differently for boys and girls.

The direction of relationships between children's temperament and SC is not always clear in the literature and temperamental dimensions may contribute differentially to different aspects of SC. There is also a lack of consistent data suggesting significant gender differences in temperament's relation to SC and several studies have not conducted separate analyses by gender or considered rater differences or the effects of raw versus standardized scores (see Chapter 2 and Appendix B). One objective of the present study was to investigate patterns of relations between temperament and SC for boys and girls and whether patterns differ when considering different informants or when raw versus standard scores are used.

Additionally, interactions between gender and temperament in the prediction of social competence were examined in order to understand whether gender moderates the effects of temperament on SC and if the moderating effects of gender would hold true across informants and for both raw and standard scores. Significant interactions are organized and discussed below based on temperamental "superfactors" and their relations to SC.

**Summary of significant correlations and interactions.** Overall, current findings indicated that there were more significant correlations for teacher-rated temperament and SC compared to parent-rated temperament and SC, which was hypothesized and not surprising because teachers also provided the SC ratings. There were more significant correlations for girls between temperament and SC compared to boys. Girls had five more significant correlations than boys when rated by teachers, and two more than boys when rated by parents. For teacher raters, the use of raw versus T-scores only made a difference on Impulsivity for girls, though correlations with SC differed between raw and T-scores for parent ratings of temperament.

Regression analyses revealed 10 significant interactions, including three under the dimension of Extraversion/Surgency, four under Effortful Control, and three under Negative Affectivity. There were 8 significant main effects for teachers and 3 for parent raters. Overall, Activity Level and Anger/Frustration were found to have opposite effects on SC for gender and are further described below. On Sadness, relations with social competence were in the opposite direction for parent and teacher informants, positively associated for parent ratings and negatively associated for teacher ratings.

In summary, Activity Level, Inhibitory Control, and Sadness yielded significant interactions with gender regardless of rater and whether T-scores or raw scores were used. Inhibitory Control also yielded significant main effects regardless of rater. Falling Reactivity/Soothability and Smiling/Laughter were not found to have significant interactions with gender in the prediction of SC for parent ratings and were unique to teacher raters, whereas Low Intensity Pleasure and Shyness were unique to parent raters. For parents, Activity Level, Inhibitory Control, Low Intensity Pleasure, Sadness, and Shyness were significant for both T-scores and raw scores.

Anger/Frustration, Attentional Focusing, and Perceptual Sensitivity were not found to have significant interactions with gender in the prediction of SC for parent ratings when T-scores were used and were unique to the use of raw scores. One main effect, Inhibitory Control, was only significant for parents when raw scores were used. For teachers, T-scores and raw scores both yielded the same five significant interactions, and all main effects were significant for both raw scores and T-scores as well. This again reiterates the value of raw scores for parents, supporting the idea that raw scores are less important when considering teacher ratings.

**Relations between temperament and SC by rater.** Patterns of correlations between temperament and several SCBE scales were considered in addition to the overall SC composite scale. Differential patterns between parent and teacher rated temperament and SC was a central question in this study and outlined and discussed below. Overall, there were no commonalities between boys and girls when considering the correlations between parent-rated temperament and the SC composite score on the SCBE, though there were seven commonalities between genders when teacher ratings of temperament were correlated with SC. Because there were more gender differences for teacher ratings, it can be concluded that informant does, in fact, matter when relating variables to one another and with respect to gender.

***Parent-rated temperament and SC.*** For boys, only parent-rated Inhibitory Control correlated with the overall SC composite score, and was only the case for the raw score. Inhibitory Control was associated with more calm, cooperative, autonomous, and overall socially competent behavior for boys. The regulation of emotional and behavioral responses to the environment has been associated with SC. Children who exhibit higher levels of effortful control have shown higher levels of SC and the ability to create more positive relationships with others in preschool and kindergarten (Goldsmith, Aksan, Essex, Smider, & Vandell, 2001).

For girls, two parent-rated temperament scales, Shyness and Smiling/Laughter, significantly correlated with the overall SC composite score, though these aspects of Extraversion/Surgency are not as clearly correlated with SC in the literature. Smiling/Laughter was significantly correlated with more joyful, secure, and integrated behavior for girls, but not for boys. Rubin, Coplan, Fox, and Calkins (1995) found that among four- and five-year-olds, approach-withdrawal tendencies in social interactions and their regulatory abilities worked together to influence SC. For children higher on approach, low levels of regulation contributed to antisocial behaviors (such as peer aggression and classroom disruption) and high levels of regulation contributed to prosocial behaviors toward peers. For children higher on withdrawal, lower regulation contributed to reticent and anxious social behavior, whereas higher regulation contributed to independent play.

When considering correlations of parent-rated temperament with the eight SCBE subscales, Shyness yielded the most correlations for boys and was associated with more depressive, anxious, and isolated behavior, though it did not significantly correlate with the SC composite score overall. Shyness has shown conflicting relations with SC and tends to vary with age. Some have found it to positively predict SC because shy children are more likely to exhibit empathy and conscience (Rothbart, Ahadi, & Evans, 2000). Shyness in mid-to-late childhood has been found to predict poorer social skills and higher levels of internalizing problems, including anxiety and depression, in early adolescence, though this relationship was not found to be true for shyness in early childhood (Karevold, Ystrom, Coplan, Sanson, & Mathiesen, 2012). However, some studies have shown the pattern of relations found in the present study with shyness in early childhood negatively predicting SC. Shy or withdrawn children in preschool through elementary school have been found to be less prosocial than their bolder peers



(Eisenberg, Shepard, Fabes, Murphy, & Guthrie, 1998; Rydell, Bohlin, & Thorell, 2005).

Wichmann, Coplan, and Daniels (2004) found that socially withdrawn children in elementary school displayed lower levels of SC than their non-withdrawn peers. Rydell and colleagues (2005) also found that shyer preschool children were less likely than their bolder peers to initiate peer social interaction.

Anger/Frustration was not significantly correlated with any subscales of the SCBE for boys, but produced the greatest number of correlations with SCBE subscales for girls. Parent-rated Anger/Frustration was correlated with significantly more aggressive, egotistical, and oppositional behavior for girls.

***Teacher-rated temperament and SC.*** When rated by teachers, 12 of 15 temperament dimensions were significantly correlated with the SC composite score on the SCBE for girls compared to 7 of 15 for boys. Teacher-rated Anger/Frustration, Attentional Focusing, Falling Reactivity/Soothability, Fear, Inhibitory Control, Shyness, and Smiling and Laughter were the most salient temperamental dimensions for predicting SC in the classroom context for both gender groups. Teacher-rated Falling Reactivity/Soothability, Inhibitory Control and Low Intensity Pleasure were all significantly positively correlated with several SCBE subscales for girls, though none of these temperament dimensions were correlated with SC when rated by parents. These temperament dimensions appear to be unique predictors for SC when rated by teachers, though caution must be exercised when interpreting this because SC was only rated by teachers, and not by parents, in this study.

When correlating temperament with the 8 subscales of the SCBE rather than only the SC composite score, teacher-rated Falling Reactivity/Soothability was positively correlated with all

but one SCBE scale for both genders, suggesting that soothability is a predictor of SC across genders when rated by teachers. However, this was not true for parent raters.

Teacher-rated Fear was significantly negatively correlated with 7 SCBE subscales for boys and 4 SCBE subscales for girls compared to only one subscale for boys and no subscales for girls when rated by parents. Thus, Fear was unique to teacher raters as a predictor of SC in that more fearful behavior is predictive of lower SC in the classroom setting. More variability in the manifestation of fear in the classroom also contributed to this.

Anger/Frustration was significantly negatively correlated with 6 SCBE subscales for girls and 5 SCBE subscales for boys when rated by teachers. Conversely, parent-rated Anger/Frustration did not significantly correlate with any SCBE subscales for boys, though it is apparent that Anger/Frustration is a trait that is important in predicting SC for both boys and girls in the classroom setting. Attentional Focusing was positively correlated with every aspect of SC for girls and five subscales of the SCBE for boys when rated by teachers. While significant for both genders, and keeping in mind that the literature shows higher correlations within than between raters, attentional capacity was one of the strongest temperamental predictors of SC for girls in the classroom context.

#### **Raw versus standardized scores' effects on relations between temperament and SC.**

For parent ratings, there were four correlations for each gender that only produced significant results when either raw or T-scores were used, and for boys, this pattern occurred only between the temperament scale of Inhibitory Control and scales of the SCBE. For boys, raw scores produced more significant results than T-scores, whereas T-scores produced more significant correlations than raw scores for girls. However, for teacher ratings, all correlations found with raw scores were also found for T-scores.

Overall, the use of either raw scores or T-scores affected relations between temperament and SC for boys and girls depending on rater. As hypothesized, some gender differences for boys were obscured by using gender-normed T-scores on the SCBE and the examination of raw scores brought to light additional gender differences that would not have otherwise been found. Also, because the scale is normed separately by gender, it was expected that gender differences would exist, though this study shed light on which scales such differences exist. The consideration of raw scores is especially important when using parent ratings of temperament because gender differences tended to be obscured through transformed standardized scores and future studies should be designed with this in mind. However, for teacher ratings of temperament, the consideration of raw scores seems to be less necessary, but future studies are needed to replicate or refute this finding.

**Interactions of dimensions of extraversion/surgency and gender in the prediction of SC.** Activity level, shyness, and smiling/laughter were the dimensions of temperament falling under Extraversion/Surgency that resulted in significant interactions with gender in predicting SC in the current sample. Gender differences have consistently been found on aspects of Extraversion/Surgency, such as activity level and impulsivity (see Else-Quest et al., 2006), though this has not been the case for the scales of shyness and smiling/laughter.

***Activity level.*** Across raters and with both T-scores and raw scores, girls who were rated to have a high activity level had higher social competence, whereas boys who had a higher activity level had lower social competence. Of the significant interactions for activity level, only the slope for boys was significant when using T-scores and parent ratings. There was a significant negative relationship between parent-rated activity level and SC for boys. Previous studies have shown that difficulty regulating oneself may result in acting out or aggressive

behavior, which may be viewed as a lack of socially appropriate behavior and lower acceptance by peers (Spinrad, Eisenberg, Cumberland, Fabes, Valiente, Shepard, Reiser, Losoya, & Guthrie, 2006). It may be that, for boys, a high activity level translates to difficulties with self-regulation that result in aggressive, negative behaviors.

However, for girls, a high activity level is perceived to result in socially competent behavior and this effect was found to be even more pronounced in the classroom setting compared to the home. It could be that they are viewed as sociable and more likely to approach or initiate interactions due to their higher level of activity. Despite this, for teachers, high activity level makes less of a difference for boys than girls resulting in a smaller negative difference in SC as activity level increases, which could be attributed to the fact that perhaps teachers are accustomed to preschool boys being more active than girls. Additionally, it has been found that sociable children who were high on approach but lacked regulation of their behavior were considered disruptive and aggressive, whereas those who were high on approach but able to regulate their behavior were considered to be socially competent (Rubin, et al., 1995).

Qualitative aspects of activity level should be considered and it could be that girls who were rated high on activity level are viewed as active, but still able to regulate their behavior, which is plausible considering that girls are often rated with higher regulation (e.g., inhibitory control and attentional focusing capacity).

Interestingly, as hypothesized, there were no gender differences at the lower end of parent-rated activity level when using raw scores, though gender differences were created when transformed to T-scores. This finding sheds light on the question as to whether transformed standard scores are an accurate indicator of relationships and the importance of interpreting scores with caution and considering raw scores when possible.

*Shyness.* Higher ratings of shyness had a more negative and significant effect on SC for girls than boys for both T-scores and raw scores. Boys had similar levels of SC regardless of whether they were viewed as more or less shy. Children who are rated high on shyness have been found to exhibit less socially competent behaviors compared to their nonreticent peers (Rubin & Rose-Krasnor, 1992), which aligns with the current findings for girls, but not for boys. Coplan, Gavinski-Molina, Lagacé-Séguin, and Wichmann (2001) found that reticent behavior was negatively associated with kindergarten teacher ratings of SC. Children who more frequently displayed socially wary behavior were not perceived to engage in competent and successful social interactions by teachers. This is similar to other findings depicting shy and anxious children as having difficulties with both social skills and social-cognitive skills (LeMare & Rubin, 1987; Rubin & Krasnor, 1986). However, Coplan and colleagues (2001) found no significant gender differences in the relations between reticent behavior and teacher ratings of SC.

Conversely, Rudasill and Konold (2008) found that teachers rated shyer children (as rated by parents on the CBQ) higher on cooperation and self-control on the SSRS in kindergarten, first, and second grade compared to less shy children, though this is not what was found in the current sample. Additionally, it is important to consider that the SSRS measures different aspects of SC, such as cooperation and self-control, compared to the SCBE, which is a measure of emotionality and interactions with peers and adults. As suggested in Chapter 2, the consideration of what is measured by scales of social competence is often overlooked when comparing research findings.

Current findings also indicted that shyness is a more significant determinant of SC for girls compared to boys, which is not in keeping with several previous findings. Previous studies

have shown that shyness may be less acceptable for boys than for girls (Sadker & Sadker, 1994). Similarly, some studies have found that parents respond differently to shyness in boys and girls in that shyness in girls is more likely to be rewarded and accepted by parents, whereas shyness in boys is more likely to be discouraged (Engfer, 1993; Stevenson-Hinde & Glover, 1996). One study found that that mothers were less accepting of their shy sons, but more affectionate toward their shy daughters. Also, shy boys tended to have more negative interactions with parents, whereas shy girls had more positive interactions (Simpson & Stevenson-Hinde, 1985). Some research has shown that shy boys have more adjustment difficulties from early childhood into adulthood compared to withdrawn girls. In early childhood, it has been reported that extremely shy preschool boys have more behavior problems than extremely shy girls (Stevenson-Hinde & Glover, 1996).

One recent qualitative study conducted by Akseer, Bosacki, Rose-Krasnor, and Coplan (2014) interviewed Canadian elementary teachers about their thoughts, beliefs, feelings, and attitudes regarding their experiences with shy girls and boys in the classroom. They found differences in teachers' perceptions of shyness in boys and girls in the classroom in that teachers tended to perceive shyness as particularly problematic for boys compared to girls, which is also contradictory to the current findings. Interestingly, Stevenson-Hinde and Glover (1996) found that gender differences were more prevalent among groups of "medium" shy versus "high" shy boys and girls and asserted that high shy children of both genders may be at risk for later disorders.

***Smiling/laughter.*** On smiling/laughter, the trend for both genders using T-scores and raw scores was that higher scores on smiling/laughter significantly predicted higher scores on SC. Smiling/Laughter also had more of an effect on SC for girls than boys. While the current

study found that smiling and laughter were significant predictors of SC in preschool children for both genders, no previous studies found reported interactions specifically between smiling/laughter and gender in the prediction of SC. It is intuitive that children who show outward behavioral indicators of happiness, such as smiling and laughter, would be viewed as more extraverted and likely to engage in social interaction. One study found that children's spontaneous facial expressivity predicted SC as measured by peer sociometrics (Walden & Field, 1990). Girls have also been reported to show greater emotional expressivity than boys (Hall, 1984), and children with emotional and behavioral problems have shown deficits in producing emotional expressivity (Walker, 1981).

**Interactions of dimensions of effortful control and gender in the prediction of SC.**

Inhibitory control, low intensity pleasure, attentional focusing, and perceptual sensitivity were the dimensions of the superfactor Effortful Control that resulted in significant interactions with gender in predicting SC in the current sample. Effortful control has consistently yielded significant gender differences (see Else-Quest et al., 2006). Rudasill and Konold (2008) found that both inhibitory control and attentional focusing contributed to ratings of SC in that teachers rated both boys and girls with greater inhibitory control and attentional focusing as significantly more socially competent. Also, Zhang (2011) found that growth in social competence was predicted significantly by the interaction between temperamental EC and gender (Zhang, 2011).

***Attentional focusing.*** Attentional focusing significantly interacted with gender, but only with parent ratings and only when SCBE raw scores were used. This is another temperamental dimension that yielded gender differences that may have been overlooked if the raw scores were not considered. Girls and boys with higher attentional focusing capacity appear to have similar levels of SC, whereas, there was a larger difference between boys and girls with similarly poor

attention. Difficulty with attentional focusing has a more negative effect on SC for boys compared to girls, which is contradictory to what was found for other traits that boys are typically expected to be scored lower than girls. Attentional focusing had less of an effect on SC ratings for girls and is more influential in predicting SC for boys perhaps because it is coupled with higher activity level.

***Inhibitory control.*** Across raters and with both T-scores and raw scores, the general trend in the current findings was that girls and boys who were rated to have higher inhibitory control had higher SC. However, only teacher-rated inhibitory control yielded significant slopes and was true for both boys and girls. Inhibitory behavior was a strong predictor of teacher-perceived SC and girls and boys who had similarly low levels of inhibitory control were rated to have different levels of SC with girls being rated lower. Inhibitory control is highly influential in teachers' perceptions of SC to the extent that lower inhibitory control resulted in clinically significant low levels of SC, and this was even more pronounced for girls.

Relatedly, Olson (1989) found that preschoolers' social functioning was positively related to a child's ability to inhibit and control their behavioral responses, and preschoolers with low inhibitory control were less liked by their peers and rated as less socially competent than nonimpulsive preschoolers. However, Sebanc and Tout (1997) found that among boys, lower inhibitory control and higher impulsivity was associated with having (versus not having) friends in preschool. Thus, previous findings indicate that the impact of EC, specifically inhibitory control, on SC may differ for boys compared to girls (Gleason, Gower, Hohmann, & Gleason, 2005), and the current study endorsed inhibitory control as a significant predictor of SC regardless of gender.



*Low intensity pleasure.* At the lower extreme of low intensity pleasure on the CBQ, there were no gender differences when using raw scores, though gender differences did surface when transformed to T-scores. When raw scores were used, a larger gender difference emerged at the higher end of low intensity pleasure with girls rated higher on SC compared to when T-scores were used. T-scores appeared to mask gender differences as hypothesized. Lower ratings on low intensity pleasure had a more negative effect on SC for girls than boys, but when only T-scores were compared. Low intensity pleasure may not have as much of a deleterious effect on SC for girls as it appears because the difference only emerged when considering T-scores rather than girls' true raw scores. For boys, low intensity pleasure has less of an effect on levels of SC at the low, middle, and high ends when using either T-scores or raw scores, and it is a more influential temperamental trait on SC for girls.

*Perceptual sensitivity.* Parent-rated perceptual sensitivity interacted differently with gender to predict SC but only when using raw scores and this difference was masked when analyzing T-scores. Having lower perceptual sensitivity had more of an effect on SC for boys compared to girls. When comparing boys and girls with similar amounts of high and low perceptual sensitivity, boys had lower SC compared to girls.

**Interactions of dimensions of negative affectivity and gender in the prediction of SC.** Sadness, falling reactivity/soothability, and anger/frustration were the dimensions of Negative Affectivity that resulted in significant interactions with gender in predicting SC in the current sample. Both maternal and teacher reports of emotion regulation are associated with SC (e.g., Eisenberg, Fabes, Murphy, Maszk, Smith, & Karbon, 1995), and some research has indicated that poor emotional regulation and high negative affectivity in preschoolers' is negatively correlated with older children's SC as rated by both parents and teachers (Eisenberg et al., 1995;

Eisenberg, Fabes, Murphy, Karbon, Smith, & Maszk, 1996; Eisenberg, Fabes, Guthrie, Murphy, Maszk, Holmgren, & Suh, 1996; Eisenberg, Fabes, Shepard, Murphy, Guthrie, & Jones, 1997).

***Anger/frustration.*** Anger/frustration interacted differently with gender, though only through the use of raw scores and parent ratings, and these differences were disguised when using T-scores. Angrier girls had lower SC, but angrier boys had higher SC. There was more of a gender difference in SC when comparing boys and girls with similarly low levels of anger/frustration and gender differences lessened with higher levels of anger. Crick and colleagues (1997) found that girls' expression of negative affect may be more salient than that of boys because girls are expected to be "nice." Anger has also been found to negatively influence SC in preschoolers when measured by peer sociometrics (Denham, et al., 1990; Denham & McKinley, 1993), though no studies found reported links between anger and teacher-rated SC nor has the interaction of anger with gender in predicting SC been reported.

***Falling reactivity/soothability.*** Both boys and girls who are more easily soothed have higher SC scores. Larger gender differences appeared at lower levels of falling reactivity/soothability when raw scores were used compared to T-scores, though the use of T-scores created the illusion of larger gender differences than what is revealed through the use of raw scores. Many studies have documented that children experience greater success with their peers when they are capable of successfully managing their emotional states in comparison to children who are less reactive (e.g., Rubin, Coplan, Fox, & Calkins, 1995; Stocker & Dunn, 1990). Letcher, Smart, Sanson, and Toumbourou (2009) found that temperamental reactivity was more salient for girls on increasing trajectories of maladjustment, including social rejection, later in childhood and adolescence. Infant temperament characteristics, including reactivity, did not influence adjustment in boys and was only apparent in girls, suggesting that reactivity and

low soothability may cause higher risk of internalizing problems and lower SC in girls than in boys (Letcher et al., 2009). Because reactivity and soothability is important for SC in both genders, reliance on parent-rated temperament in toddlers and young children versus teacher-rated temperament may distort our understanding of the role of temperament in relation to SC.

Emotion regulation, of which soothability is a part, is also positively linked to the development of friendships and peer acceptance in preschool (Gleason, Gower, Hohmann, & Gleason, 2005). Preschoolers are still learning to regulate their emotions, which suggests that befriending a peer who has poor emotion regulation and high reactivity may be problematic because it threatens one's own reactivity and regulation (Walden, Lemerise, & Smith, 1999), and may thus promote peer rejection and less social interaction. Soothable children also have also been reported to exhibit fewer behavior problems than their peers (Youngblade & Mulvihill, 1998).

*Sadness.* Sadness interacted differently with gender in predicting SC across raters and when using both raw scores and T-scores, and the slopes of the interaction were significant for teacher ratings. On the CBQ-T, both girls and boys who were rated sadder had lower SC. Sadness had a more deleterious effect on SC for boys compared to girls and the same levels of high sadness for both genders translated to lower levels of SC for boys. Similarly, another study revealed a significant negative relationship between expressed sadness and teacher-rated SC, but only for boys (Jones, Eisenberg, Fabes, & MacKinnon, 2002). Denham and colleagues (2003) noted that emotional expression contributes to adults' ratings of boys' SC differently from those of girls, and the development of SC in boys appears to be particularly sensitive to affectivity and emotional regulation (Eisenberg, Fabes, Guthrie, et al., 1996), as was true with the current sample. It also appears that more freedom is granted to females for sadness expression compared

to the stoic nature expected for males (Brody & Hall, 2000). Gender socialization theory also emphasizes male suppression of sadness expression due to expectancies of negative social consequences (Fuchs & Thelen, 1988). Emotional expressivity that is consistent with those norms is likely to evoke positive social responses and promote social acceptance (Denham, et al., 2003). Thus, if the male gender role is equated with stoicism and withholding sadness, then violating these norms could result in negative social responses. Gender differences appeared similar for T-scores and raw scores on teacher ratings.

However, for parent ratings using T-scores and raw scores, the trend was reversed for girls in that higher sadness predicted higher scores on SC, though for boys SC ratings remained the same across low, moderate, and high levels of sadness. It may be that parents rated their children as high on sadness based on what is observed at home, but the expression of sadness may be tempered or not observed at all in the school setting, thus not having have a negative effect on ratings of SC by teachers. In one study investigating the acceptability of emotional expression in an elementary-aged sample (grades 2-6), outward expressions of anger, disappointment, and embarrassment were associated with expectations of unsupportive reactions, whereas expressions of sadness were linked to expectations of supportive responses (Underwood, 1997). Perhaps girls who exhibit sadness and are met with supportive responses at home are less likely to exhibit the same expressions of emotionality at school. Also, for parents, raw scores revealed larger gender differences for lower levels of Sadness compared to T-scores suggesting an even larger gender difference than what might have been typically interpreted through the use of T-scores.

### **Overall Conclusions and Implications**

**Conclusions regarding gender moderation of temperament and SC.** In her review of gender differences in temperament, Else-Quest (2012) indicated that research investigating gender as a moderator of temperament effects is “intriguing but also generally difficult to identify in a literature search,” and that, “a more concerted effort to identify such patterns would expand our understanding of both temperament and gender, and ultimately translate to more effective therapies and interventions for children...” (p. 491). This study aimed to identify such patterns of interaction between temperament and gender, and when considering the interaction results together, it is apparent that overall temperament interacts with gender in its prediction of SC and that interactions differ between contexts and raters. Children behave somewhat differently in different settings, and moreover, teachers and parents seem to focus on different aspects of children’s temperament. Eisenberg and colleagues (1994) found that mothers and teachers emphasize differing features of children’s emotionality with mothers being more concerned with subtle negative emotions and teacher reports focusing on the intensity of emotion. It may be that teachers focused on the intensity of sadness expressed in the classroom, which translated to lower SC for both genders. However, higher parent-rated sadness equated to higher SC for both genders, which may indicate that parents rate sadness based on more subtle emotionality that is observed in the home, but may not be noticed in the classroom setting. In other words, perhaps parents notice “appropriately” expressed sadness in tune with the surrounding context.

Activity Level interacted with gender with higher activity level associated with higher SC for girls, but lower SC for boys. It is well-documented that by the preschool-age period, boys are temperamentally more difficult, more likely to have lower ratings of SC, and to show more externalizing behavior problems, including hyperactivity and aggression. It may be that girls’

high levels of activity are paired with positive emotion and viewed in the classroom as extraverted and social behavior. However, boys' high activity levels may be viewed as poorly regulated, hyperactive, and contributing to physical aggression toward others. The interaction between activity level and gender may be driven, in part, by other temperamental traits that provide a context for the expression of activity level.

Extraversion/surgency has been found to predict less disconnected and withdrawn peer interaction, but no correlations have been found between extraversion/surgency and disruptive peer play (Mathieson & Banerjee, 2010). Denham and colleagues (2001) found that parent-rated effortful control predicted greater interactive play with peers, which is consistent with the assertion that effortful control plays an important role in SC (Rothbart et al., 2003). Children with high effortful control, including high inhibitory control and attentional focusing, are viewed by teachers as more "teachable," and it may be that girls' high activity level is coupled with high levels of effortful control making it less likely to negatively impact ratings of SC (Blair, 2002). Denham (2001) notes that combinations of high surgency with high negative affectivity or low effortful control could predict negative developmental outcomes. Overall, effortful control, more specifically self-regulation, seems to have the strongest influence on adjustment and developmental trajectories for both genders and allows for the effects of "negative" temperamental traits to be tempered or even reversed.

**Implications for the use of raw versus standardized scores.** Overall, the use of raw versus T-scores did not impact the correlational results as much as their use impacted the interaction results in that raw scores produced more significant temperament x gender interactions for parent ratings of temperament. Gender norms on the SCBE were designed to reduce variability and extreme scores and its effect appears to downplay the moderating effect of

gender on other variables. The results of this study suggest that the use of gender norms, namely for the SCBE, may distort results and the use of raw scores may provide clearer insight into links with theoretically relevant variables, such as temperament.

**Conclusions regarding the links between variability and moderation.** For those temperament variables that produced significant interactions, there were some distributional patterns. Most of the temperament scales that were significantly variable also produced significant interactions, including Activity Level, Falling Reactivity/Soothability, Inhibitory Control, and Smiling/Laughter for teacher raters. High Intensity Pleasure was the only teacher-rated variable that produced much variability, but did not result in a significant interaction with gender in predicting SC. Fear and Falling Reactivity/Soothability yielded significant variability for parent raters but no significant interactions. Overall, variability appeared to be linked to moderation. When considering how variability relates to correlations, Falling Reactivity/Soothability and Smiling/Laughter were the only two temperament scales that yielded high variability and also produced significant correlations with SC. Based on the findings in this study, future studies should further investigate methodological patterns between variability and moderation when considering gender differences.





- Overall, boys were more likely to be rated with more variability compared to girls for both parent and teacher raters. Parents with more variability on positive scales and teachers rated with more variability on negative scales.
- The scales that produced the most variability for parent raters were scales that are typically more associated with girls (i.e., Falling Reactivity/Soothability, Perceptual Sensitivity), though for teachers, the scales with the most variability are typically associated with boys (i.e., High Intensity Pleasure, Impulsivity, Inhibitory Control)
- Only one scale yielded more variability for girls, which was Fear by teacher raters
- Girls were not rated with significantly more variability by parents on any of the temperament scales
- Overall, boys were more likely to be rated with more variability compared to girls for both parent and teacher raters
- When mean and SD differences did coincide, the higher mean was usually more variable
- Teachers tended to provide more extreme ratings for boys and girls on

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1b) Locus of Gender Differences  
The proportion of boys and girls at 3

different points in the distribution were examined with the purpose of identifying where differences lie in the distribution and whether they are located in the middle, upper or lower bounds.	15 subscales of CBQ	particular temperamental traits compared to parents
	15 subscales of CBQ-T	<ul style="list-style-type: none"> <li>• The scales that indicated distributional differences were ones that have consistently shown to have gender differences and have also yielded mean differences</li> <li>• Out of 45 comparisons for parent raters, there was one significant difference found when comparing tertiles and it was between the two extreme tertiles</li> <li>• Out of 45 comparisons for teacher raters, there were 12 significant differences found when comparing tertiles <ul style="list-style-type: none"> <li>○ 6 of them pertaining to the middle and extreme tertiles</li> <li>○ 6 of them pertaining to the proportions in the extreme tertiles</li> </ul> </li> <li>• Overall, teacher ratings yielded more gender differences in the extremes of the distribution compared to parent ratings, as hypothesized</li> </ul>

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## **2. Distributional Gender Differences in Temperament By Rater**

Given that low rater agreement is common, it is important to understand the tendencies of informants and how they may differ for boys and girls. Distributional differences will be considered for girls and boys as described in Question #1, but also whether differences are the same for parent and teacher raters. Whereas Question #1 considers gender differences in each rater separately, Question #2 compares raters on differences in girls and boys.

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### 2a) Means and Variability

Analyses compared whether gender means and differences in variability were the same

15 subscales of CBQ

- Parents and teachers differed on the following scales: Activity Level, Anger/Frustration, Approach/Positive

for parent and teacher raters.

15 subscales of CBQ-T

Anticipation, Falling  
Reactivity/Soothability, Fear, High  
Intensity Pleasure, Inhibitory Control,  
Perceptual Sensitivity, Sadness,  
Smiling/Laughter

- Several of these are well-  
documented in the literature
- On the temperament scales on which  
parents significantly differed from  
teachers, parents tended to rate boys more  
favorably than teachers
- Mean and variability differences are often  
independent of one another
  - Differences in means and SDs do  
not always coincide emphasizing  
importance of considering both
- Confirmed that parent-teacher rater  
agreement is low on several dimensions  
of temperament and holds true for both  
boys and girls
  - This was hypothesized and to be  
expected
- Parents rate more favorably than teachers,  
especially for boys

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### 3. Distributional Differences in SC as Measured by the SCBE

Because distributional differences for boys and girls may be obscured by using gender-normed T-scores on the SCBE, raw scores will be examined to further dissect distributional differences

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#### 3a) Means and Variability

Means and SDs for boys and girls were compared to investigate gender differences and differences between the use of T-scores and raw scores.

T-scores and raw scores for 8 subscales and SC composite scale on the SCBE

- Mean Differences
  - As hypothesized, raw scores on the SCBE produced more significant mean differences between genders than T-scores, which did not produce any gender differences in

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		<p>means</p> <ul style="list-style-type: none"> <li>○ Raw scores resulted in 5 mean differences with girls scoring higher on all five of the scales <ul style="list-style-type: none"> <li>▪ i.e., Girls were rated to be more tolerant, calm, prosocial, cooperative, and socially competent than boys</li> </ul> </li> <li>● SDs <ul style="list-style-type: none"> <li>○ None of the scales were significantly variable when using T-scores or raw scores, though several raw score scales were approaching significance</li> <li>○ The 3 approaching significance yielded small-moderate effect sizes, and were also scales that had significant mean differences with boys rated more negatively and with more variability than girls <ul style="list-style-type: none"> <li>▪ i.e., More angry, aggressive, and egotistical</li> </ul> </li> </ul> </li> </ul>
<p>3b) Locus of Gender Differences The distribution of T-scores and raw scores were compared between boys and girls.</p>	<p>T-scores and raw scores for the 8 subscales and SC composite scale on the SCBE</p>	<ul style="list-style-type: none"> <li>● When the proportion of boys and girls categorized into tertiles were compared on SCBE T-scores, both genders were found to be distributed evenly on all 9 scales, as hypothesized</li> <li>● Raw scores on the SCBE resulted in more gender differences in the extremes of the distribution compared to T-scores, as hypothesized <ul style="list-style-type: none"> <li>○ Boys and girls were found to be</li> </ul> </li> </ul>

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		distributed differently on 3 SCBE scales
		<ul style="list-style-type: none"> <li>• More boys fell in the lower tertiles and more girls fell in the upper tertiles on these differences</li> <li>• Out of 27 comparisons for raw scores, there were 4 significant differences found overall between tertiles (on 3 scales) <ul style="list-style-type: none"> <li>○ 2 significant differences pertaining to the extreme and middle tertiles</li> <li>○ 2 differences pertaining to the extreme tertiles</li> </ul> </li> </ul>
<b>4. Relations between SC and Temperament in Boys and Girls</b>		
The purpose is to investigate whether patterns of relations between temperament and SC for boys and girls are the same for informants and if patterns differ when raw vs. standard scores are used		
4a. Considered what percent of variance is accounted for by rater/teacher? Conducted with the CBQ-T, SCBE T-scores, and SCBE raw score data specified as the criterion.	15 subscales of CBQ-T  T-scores and raw scores for 8 subscales and SC composite scale on the SCBE	<ul style="list-style-type: none"> <li>• Found non-statistically significant parameter estimates</li> <li>• When both age and class were considered simultaneously, there was no impact of the effect of class</li> </ul>
4b. Correlations and Moderation		
<ul style="list-style-type: none"> <li>• Were there differential correlational patterns between parents and teachers and when using raw vs. standard scores for SC?</li> <li>• Were there interactions between gender and parent/teacher-rated temperament scales in the prediction of social competence? <ul style="list-style-type: none"> <li>○ And will this be true for both raw and standard scores for SC?</li> </ul> </li> </ul>	Temperament: 15 scales of the CBQ and CBQ-T  SC: SC composite scale on SCBE	<ul style="list-style-type: none"> <li>• More significant correlations for teacher-rated temperament and SC compared to parent-rated temperament and SC, which was hypothesized and not surprising because teachers also provided the SC ratings</li> <li>• When rated by teachers, 12 of 15 temperament dimensions were significantly correlated with the SC composite score on the SCBE for girls compared to 7 of 15 for boys</li> </ul>

- For teachers, the use of raw scores vs. T-scores on the SCBE subscales made less of a difference compared to parents
    - For boys, raw scores produced more significant results than T-scores, whereas T-scores produced more significant results than raw scores for girls
  - Summary of Findings for Correlational Patterns
    - Because there were fewer gender differences for teacher ratings, it can be concluded that informant does, in fact, matter when relating variables to one another and with respect to gender
    - There were more significant correlations for girls between temperament and SC compared to boys
    - When considering all SCBE subscales, raw scores produced more significant relations with temperament and gender interactions for parent ratings of temperament
  - Regression analyses revealed 10 significant interactions, including 4 under the dimension of EC, 3 under ES, and 3 under NA
    - Overall, Activity Level and Anger/Frustration were found to have opposite effects on SC for
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- gender
  - On Sadness, there were opposite effects for parents and teachers with Sadness positively associated with SC for parent ratings, but more strongly negatively associated with SC for teacher ratings
  - More significant main effects for teachers (8) compared to parents (3), and all were significant for both raw scores and T-scores for teachers
  - In summary, Activity Level, Inhibitory Control, and Sadness yielded significant interactions with gender regardless of rater and whether T-scores or raw scores were used
  - Parent vs. Teacher Raters
    - Falling Reactivity/ Soothability and Smiling/Laughter were unique to teacher raters, whereas Low Intensity Pleasure and Shyness were unique to parent raters
    - For parents, Activity Level, Inhibitory Control, Low Intensity Pleasure, Sadness, and Shyness were significant for both T-scores and raw scores
    - Inhibitory Control also yielded significant main effects regardless of rater
  - Raw vs. T-Scores
    - Anger/Frustration, Attentional
-

Focusing, and Perceptual Sensitivity were unique to the use of raw scores for parents

- One main effect, Inhibitory Control, was only significant for parents when raw scores were used
  - For teachers, T-scores and raw scores both yielded the same 5 significant interactions, and all main effects were significant for both raw scores and T-scores as well
  - This reiterates the use of raw scores for parents and supporting the idea that raw scores are less important when considering teacher ratings
  - Does gender serve as a moderator of the relationship between temperament and SC?
    - Parents and teachers yielded similar number of significant interactions
    - Overall, raw scores produced more significant relations with temperament x gender interactions for parent ratings of temperament
    - T-scores lower the variability and less extreme scores
    - The effect of norming is to downplay moderating effect of gender on variables
    - Raw vs. T-scores did not make as much of a difference on correlations, but did for interactions
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## **Limitations and Future Directions**

One potential limitation of the study is the homogeneity of the socioeconomic status of the children participants on whom the parent and teacher rating scales were based. Future research needs to be conducted to determine the generalizability of the new CBQ-T measure and outcomes for other ethnicities, culture, and socioeconomic populations. Second, a relatively small sample size might have also limited the findings of the current study as the sample was too small to have sufficient power for the chi-square analyses. On the several scales that yielded similar proportions in the middle tertile, a larger sample would have permitted the use of quartile or quintiles in order to pinpoint more precisely where the differences fell around the mean. However, a power analysis (with a significance criterion of .05 and a large effect size of .80) was calculated and determined that the *N* was sufficient for all analyses except the chi-square analyses. Thus, results were interpreted with caution and patterns of findings were of interest. Several findings were approaching significance and it is likely that they did not reach significance due to power, namely for the chi-square analyses which broke the sample into several smaller groups in order to identify differences between genders by tertiles. Also, even though a large number of analyses were conducted without controlling for chance findings, the specific patterns found are well-documented in the literature and many of the findings were consistent, thus mitigating concerns with chance findings.

Third, this study was conducted using a small number of teachers to rate a large number of children. Intraclass correlation coefficient analyses indicated that, when both age and class were considered simultaneously, there was no impact of the effect of class on the criterion variable (see Appendix E). This study was conducted with head preschool classroom teachers, and future research should investigate teacher-teacher assistant agreement. Also, limited teacher

demographic data were available in the current study, and future work might investigate if and how teacher characteristics affect the reliability of the assessments (Munis, Greenfield, Henderson, & George, 2007).

Fourth, one long-standing question that continues to deserve attention, though it is difficult to answer, is whether teacher ratings accurately reflect behavior as expressed in different contexts or whether they are a reflection of rater bias. When investigating clustered data, it is nearly impossible to discern whether differences are a function of a different classroom environment or a function of the rater. Though difficult to implement, having multiple teachers within each classroom rate children would help shed light on this problem (and including behavioral observers would not solve the problem as they would offer still a different perspective). Overall, studies often parse out the sources of variance, but there is little understanding within each source of variance.

The current study is based on parent and teacher reports of child temperament and SC, and therefore, its validity depends on the soundness of questionnaire measures (Else-Quest et al., 2006). Though there are limitations to parent and teacher ratings in general, they continue to be heavily relied upon and accepted as valid and important indicators of child behavior. Many temperament measures are heavily weighted with items regarding child-parent interactions that occur in the home environment (Keogh & Burstein, 1988), and parental reports of child behavior show only modest correlations with teacher reports (Achenbach, McConaughy, & Howell, 1987). Overall, given the reality of informant differences, it would be useful to further study the new CBQ-T measure to supplement the parent version (De Los Reyes & Kazdin, 2005) and better understand rater discrepancies. At the same time, the study would have been strengthened

by also having multiple informants for the SC measure rather than only teachers, and it would be beneficial to examine the same relations within and across informants.

As this study clearly outlined, future research should consider how the use of raw versus standardized or transformed scores influence analyses and findings. This study only considered the use of raw versus standardized scores on one scale, the SCBE, and a review of the literature revealed few studies that investigated the same question. It may be that prior study results may have been interpreted differently based on the use of raw versus standardized scores.

Future work should consider item-level analyses and whether particular items on the CBQ and CBQ-T pertain differently to boys versus girls. Also, consideration of how items relate to facets of a temperamental characteristic, how they may be influenced by gender, and their relation to SC would be beneficial. For instance, some items related to Shyness may pertain more closely to particular subtypes of Shyness, such as fearful versus self-conscious subtypes (Bruch, Giordano, & Pearl, 1986). Fearful shyness is correlated with lower social skills and higher inhibition, whereas self-conscious shyness is related to lower approach and initiation of social interactions (Bruch et al., 1986), and these considerations may assist in interpreting interactions with gender and relations to SC.

Finally, the relations between temperament scales should be considered separately for boys and girls. Further dissection of how temperament variables interacted with one another in influencing parent and teacher ratings is also of interest. A recent review of temperament and social development literature pointed to a lack of research in understanding how different temperament dimensions interact to influence SC (Sanson, Hemphill, & Smart, 2004). Multiple temperament characteristics seem to work together to influence SC (e.g., high activity level and inhibitory control may influence SC differently than high activity level and low inhibitory

control), though more studies are needed to understand these nuances and how they interact with gender.

**Appendix A: Gender Differences in Temperament Literature Review Table**

Citation	Age and N	Informant	Measures	Dimension Measured	Results		
					Girls Mean (SD)	Boys Mean (SD)	Cohen's <i>d</i> Effect Size
Zhou, Q., Eisenberg, N., Wang, Y., & Reiser, M. (2004). Chinese children's effortful control and dispositional anger/frustration: Relations to parenting styles and children's social functioning. <i>Developmental Psychology, 40</i> , 352-366.	M age=92 months; N=425	Mostly mothers and some fathers; teachers	CBQ (Rothbart, et al., 2001)	<i>Parent</i>			
				Effortful Control	4.75 (.64)	4.58 (.56)	-.28
				Anger/frustration	4.10 (.82)	4.09 (.72)	-.01
				<i>Teacher</i>			
				Effortful Control	5.17 (.92)	4.44 (1.05)	-.73
				Anger/frustration	3.28 (.98)	3.68 (.97)	.41
Karreman, A., de Haas, S., van Tuijl, C., van Aken, M. G., & Dekovic, M. (2010). Relations among temperament, parenting and problem behavior in young children. <i>Infant Behavior &amp; Development, 33</i> ,	M age=36 months; N=89	Both mothers and fathers completed scale	CBQ (Rothbart, et al., 2001)		Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute

39-49.							
De Boo, G. M., & Spiering, M. (2010). Pre-adolescent gender differences in associations between temperament, coping, and mood. <i>Clinical Psychology &amp; Psychotherapy</i> , 17, 313-320.	Ages 8-12 years (Mean age=10.0 years) (N=404)	Child self-report	Early Adolescent Temperament Questionnaire-Revised (EATQ-R, Ellis & Rothbart, 2001; adaptation EATQ-R-Dutch version, De Boo & Kolk, 2007)	Effortful Control	29.5 (6.4)	29.3 (5.8)	-.03
			Positive Affectivity	26.6 (6.0)	25.0 (6.1)	-.26	
			Negative Affectivity	27.5 (6.3)	26.2 (6.8)	-.19	
De Boo, G. M., & Kolk, A. M. (2007). Ethnic and gender differences in temperament, and the relationship between temperament and depressive and aggressive mood. <i>Personality And Individual Differences</i> , 43, 1756-1766.	8-13 year olds (Mean age=10.7) (N=423)	Child self-report	Adapted version of the EATQ-R (Ellis & Rothbart, 2001; adaptation EATQ-R-Dutch version, De Boo & Kolk, 2007)	<i>Effortful Control</i>			
				Dutch	28.7 (6.6)	28.0 (5.9)	-.11
				Turkish	29.6 (5.6)	29.6 (5.5)	0.0
				Moroccan	30.4 (5.8)	30.6 (6.1)	.03
				Mixed Ethnic	30.3 (7.2)	30.0 (6.1)	-.04
				<i>Positive Affectivity</i>			
				Dutch	26.8 (6.1)	24.4 (6.0)	-.39
				Turkish	25.7 (5.5)	25.6 (6.2)	-.01
				Moroccan	27.0 (5.9)	25.0 (5.8)	-.34
				Mixed Ethnic	26.2 (5.9)	24.1 (6.8)	-.32
				<i>Negative Affectivity</i>			
				Dutch	26.3 (6.4)	23.8 (6.2)	-.39
Turkish	28.3 (5.8)	28.3 (6.5)	0.0				
Moroccan	29.2 (6.5)	27.6 (7.2)	-.23				
Mixed Ethnic	26.4 (5.7)	27.3 (6.9)	.14				
Miner, J. L., & Clarke-Stewart, K. (2008).	Ages 6 months, 2, 3, 4, 7, 9	Mothers and teachers	Revised Infant Temperament	ITQ scores not reported	Unavailable	Unavailable	Could not compute

Trajectories of externalizing behavior from age 2 to age 9: Relations with gender, temperament, ethnicity, parenting, and rater. <i>Developmental Psychology, 44, 771-786.</i>	years (N=1,364)		Questionnaire (ITQ; Carey & McDevitt, 1978)				
Yoleri, S., & Gursimsek, I. (2012). <i>Temperamental characteristics and peer victimization among preschool children. International Journal of Global Education, 1, 54-65.</i>	5-6 year olds (N=211)	Parents (mother or father)	Turkish version of the Short Temperament Scale for Children (STSC; Prior, Sanson, & Oberklaid, 1989; Yagmurlu & Sanson, 2009)	<i>Approach-Withdrawal</i> 5 years 6 years Total <i>Persistence</i> 5 years 6 years Total <i>Reactivity</i> 5 years 6 years Total <i>Rhythmicity</i> 5 years 6 years Total	25.6 (7.2) 26.7 (6.5) 26.1 (6.9) 26.9 (7.0) 29.6 (7.1) 28.1 (7.1) 26.8 (6.5) 26.8 (8.4) 26.8 (7.4) 28.3 (5.0) 29.2 (5.6) 28.7 (5.3)	29.3 (5.7) 27.0 (6.4) 28.2 (6.1) 26.2 (5.3) 26.3 (6.8) 26.2 (6.0) 27.5 (7.6) 29.1 (8.4) 28.2 (8.0) 29.9 (5.0) 29.8 (5.3) 29.9 (5.1)	.56 .04 .32 -.11 -.47 -.28 .09 .27 .18 .31 .11 .23
Casalin, S., Luyten, P., Vliegen, N., & Meurs, P. (2012). The structure and stability of	8-13 months (infants) and 20-25 months (toddlers)	Mother and father	<i>Infants: Infant Behavior Questionnaire-Revised (IBQ-R; Gartstein &amp;</i>	<i>Mother Reports: Infancy (IBQ-R) Surgency/Extraversion Negative Affectivity Orienting/Regulating Toddlerhood (ECBQ)</i>	5.45 (.60) 2.96 (.73) 4.82 (.66)	5.36 (.69) 2.70 (.76) 4.56 (.58)	-.13 -.34 -.41

temperament from infancy to toddlerhood: A one-year prospective study. <i>Infant Behavior &amp; Development</i> , 35, 94-108.	(N=281)		Rothbart, 2003)	Surgency/Extraversion	4.63 (.74)	4.68 (.82)	.06
				Negative Affectivity	2.89 (.69)	2.79 (.66)	-.14
				Effortful Control	4.74 (.77)	4.46 (.49)	-.43
			<i>Toddlers:</i>				
			Early Childhood Behavior Questionnaire (ECBQ; Putnam, Gartstein, & Rothbart, 2006)	<i>Father Reports: Infancy (IBQ-R)</i>			
				Surgency/Extraversion	5.07 (.86)	5.09 (.73)	.02
				Negative Affectivity	2.74 (.78)	2.83 (.79)	.11
				Orienting/Regulating	4.51 (.70)	4.47 (.61)	-.06
				<i>Toddlerhood (ECBQ)</i>			
	Surgency/Extraversion	4.15 (.74)	4.65 (.69)	.69			
	Negative Affectivity	2.95 (.59)	3.01 (.54)	.10			
	Effortful Control	4.67 (.71)	4.33 (.49)	-.55			
Rudasill, K. (2011). Child temperament, teacher-child interactions, and teacher-child relationships: A longitudinal investigation from first to third grade. <i>Early Childhood Research Quarterly</i> , 26, 147-156.	1 <sup>st</sup> -3 <sup>rd</sup> graders (N=994)	Parents (mother or father)	Author-abbreviated version of the Children's Behavior Questionnaire (CBQ; Rothbart, Ahadi, & Hershey, 1994)	Shyness Effortful Control ( <i>Inhibitory Control and Attentional Focusing scores averaged together</i> )	Unavailable	Unavailable	-.16 -.04
Gartstein, M. A., Slobodskaya, H. R., Zylitz, P., Gosztyła, D., & Nakagawa, A. (2010). A cross-cultural	3-12 months (N=236)	Parent (mother or father)	IBQ-R (Gartstein & Rothbart, 2003)	High Intensity Pleasure Approach ( <i>Other variables not reported</i> )	5.83 (.06) 4.96 (.11)	6.07 (.06) 5.37 (.10)	.37 .37



evaluation of temperament: Japan, USA, Poland, and Russia. <i>International Journal Of Psychology &amp; Psychological Therapy, 10, 55-75.</i>							
Rudasill, K., & Rimm-Kaufman, S. E. (2009). Teacher-child relationship quality: The roles of child temperament and teacher-child interactions. <i>Early Childhood Research Quarterly, 24, 107-120.</i>	1 <sup>st</sup> graders (N=819)	Parent (mother or father)	Author-abbreviated version of the CBQ; (Rothbart, et al., 1994)	Attentional Focusing Inhibitory Control Effortful Control Shyness	Not reported by gender	Not reported by gender	-.32 -.38 -.40 -.14 (computed from <i>r</i> )
Auerbach, J. G., Berger, A., Atzaba-Poria, N., Arbellé, S., Cypin, N., Friedman, A., & Landau, R. (2008). Temperament at 7, 12, and 25 months in	7, 12, and 25 month old boys (N=58)	Mother and father	7 and 12 months: the original IBQ (Rothbart, 1981) with the addition of two scales of the 1998 version of the IBQ 25 months:	7 months Activity Level Anger Attentional Shift Fear Interest Perceptual Sensitivity Pleasure Soothing 12 months	(Only boys included in study)	4.16 (.80) 3.78 (.82) 4.58 (1.26) 2.54 (.77) 4.61 (.98) 4.00 (1.39) 5.65 (.70) 4.95 (1.01)	(Could not compute)

children at familial risk for ADHD. <i>Infant And Child Development, 17, 321-338.</i>			The short version of the Toddler Behavior Questionnaire (TBAQ; Goldsmith, 2000)	Activity Level			4.32 (.77)			
				Anger			4.16 (.80)			
				Attentional Shift			4.65 (.89)			
				Fear			2.89 (.81)			
				Interest			4.39 (1.00)			
				Perceptual Sensitivity			4.27 (1.34)			
				Pleasure			5.59 (.76)			
				Soothing			5.01 (.99)			
				<i>24 months</i>						
				Activity Level			4.70 (.85)			
				Anger			4.31 (1.10)			
				Attentional Shift			--			
				Fear			2.62 (.87)			
				Interest			4.30 (.93)			
Perceptual Sensitivity			3.11 (.79)							
Pleasure			5.45 (.74)							
Soothing			5.10 (.78)							
Ruf, H. T., Schmidt, N. L., Lemery-Chalfant, K., & Goldsmith, H. (2008). Components of childhood impulsivity and inattention: Child, family, and genetic correlates. <i>European Journal Of Developmental Science, 2, 52-76.</i>	8-9 years (N=256 families with twins)	Multi- informant (Full text not available)	Multi-method (Full text not available)	Inattention Impulsivity Defiance Aggression	Unavailable	Unavailable	Could not compute			
Blandon, A. Y.,	4, 5, and 7	Mother	CBQ, Short	Negative Affectivity	Not reported	Not reported	Could not			

Calkins, S. D., Keane, S. P., & O'Brien, M. (2010). Contributions of child's physiology and maternal behavior to children's trajectories of temperamental reactivity. <i>Developmental Psychology, 46,</i> 1089-1102.	years (N=370)		Form (CBQ- SF; Putnam & Rothbart, 2006)	Surgency	by gender	by gender	compute; results indicated that gender was a significant predictor of surgency at age 7 and girls had lower levels of surgency than boys.
Olson, S. L., Sameroff, A. J., Kerr, D. R., Lopez, N. L., & Wellman, H. M. (2005). Developmental foundations of externalizing problems in young children: The role of effortful control. <i>Development And Psychopathology,</i> 17, 25-45.	3 year olds (N=220)	Mother	Abbreviated version of the CBQ (Ahadi, Rothbart, & Ye, 1993).	Effortful Control <i>(Created an Effortful Control Index by summing children's scores on Inhibitory Control and Attentional Focusing)</i> Anger-Frustration	.17 (1.21)  4.55 (.72)	-19 (1.44)  4.58 (.76)	-.23  .04
Rudasill, K., & Konold, T. R. (2008). Contributions of	Rated at 4.5 years, K, 1 <sup>st</sup> , and 2 <sup>nd</sup> grades	Mother and teacher ratings at	Mothers rated children on the CBQ (Rothbart, et	CBQ Shyness Attentional Focusing Inhibitory Control	Numbers were not reported for non-	Numbers were not reported for non-	Numbers were not reported for non-

children's temperament to teachers' judgments of social competence from kindergarten through second grade. <i>Early Education And Development, 19</i> , 643-666.	(N=1,364)	all four time points	al., 1994) at 4.5 years,		significant effects of gender	significant effects of gender	significant effects of gender
Booth-LaForce, C., & Oxford, M. L. (2008). Trajectories of social withdrawal from grades 1 to 6: Prediction from early parenting, attachment, and temperament. <i>Developmental Psychology, 44</i> , 1298-1313.	Followed from birth through Grade 6 and assessed at 1, 6, 15, 24, 36, and 54 months, and when they were in kindergarten and grades 1, 2, 3, 4, 5, and 6. (N=1,092)	Mothers	Revised ITQ (Carey & McDevitt, 1978) at 6 months and CBQ (Rothbart, et al., 1994) at 54 months	<i>ITQ</i> Approach Mood Adaptability Intrusiveness Sensitivity <i>CBQ</i> Shyness Inhibitory Control	Means and SD's not reported by gender	Means and SD's not reported by gender	-.18 -.06 -.04 .14 -.10 -.12 -.34
Spinrad, T. L., Eisenberg, N., Cumberland, A., Fabes, R. A., Valiente, C.,	Ages 4.5-7.9 years  <i>Time 1:</i> Girls M	Mothers and teachers	CBQ (Rothbart, Ahadi, Hersey, & Fisher, 2001;	<i>Time 1 Mother</i> Effortful Regulation Impulsivity  <i>Time 1 Teacher</i>	4.59 (0.59) 4.44 (0.87)	4.25 (0.82) 4.63 (0.80)	-.48 .23

Shepard, S. A., Reiser, M., Losoya, S.H., & Guthrie, I. K. (2006). Relation of emotion- related regulation to children's social competence: A longitudinal study. <i>Emotion</i> , 6, 498-510.	age=74.58 months, Boys M age=72.58 months (N=214)  <i>Time 2:</i> Girls M age=7.72 years, Boys M age=7.61 years (N=193)	items were dropped or modified to make them appropriate for teachers); Effortful Regulation included attention shifting, attention focusing, and inhibitory control scales	Effortful Regulation	5.14 (0.92)	4.65 (0.99)	-.51	
			Impulsivity	3.90 (1.02)	4.32 (1.20)	.38	
			<i>Time 2 Mother</i>				
			Effortful Regulation	4.61 (0.65)	4.40 (0.79)	-.29	
			Impulsivity	4.30 (0.84)	4.60 (0.75)	.38	
			<i>Time 2 Teacher</i>				
Effortful Regulation	5.13 (0.90)	4.48 (1.00)	-.68				
Impulsivity	3.93 (1.00)	4.35 (0.95)	.44				
Gleason, T. R., Gower, A. L., Hohmann, L. M., & Gleason, T. C. (2005). Temperament and friendship in preschool-aged children. <i>International Journal Of Behavioral Development</i> , 29, 336-344.	Ranged from 43- 69 months (M=54 months; N=75)	Teachers (N=13)	Adapted form of the CBQ- SF (Putnam & Rothbart, 2006)	<i>Activity Level</i>			
				Class 1	2.14 (0.67)	3.75 (1.26)	1.59
				Class 2	2.17 (1.17)	3.71 (1.09)	1.36
				Class 3	3.50 (0.98)	3.61 (0.35)	0.15
				Class 4	3.22 (1.15)	4.16 (0.93)	.90
				Class 5	2.60 (1.16)	4.10 (0.98)	1.39
				<i>Impulsivity</i>			
				Class 1	0.58 (0.60)	1.07 (1.18)	.52
				Class 2	0.67 (0.71)	1.86 (0.59)	1.82

				Class 3	2.35 (0.91)	2.07 (0.73)	-.34
				Class 4	1.03 (0.92)	2.59 (1.23)	1.43
				Class 5	2.85 (0.83)	2.60 (0.93)	-.28
				<i>Soothability</i>			
				Class 1	4.39 (0.95)	3.89 (1.40)	-.42
				Class 2	4.36 (0.38)	3.61 (0.79)	-1.2
				Class 3	2.85 (1.01)	3.36 (0.66)	.59
				Class 4	3.63 (1.27)	3.34 (0.84)	-.27
				Class 5	3.25 (0.74)	3.25 (0.85)	0.00
Hanish, L. D., Eisenberg, N., Fabes, R. A., Spinrad, T. L., Ryan, P., & Schmidt, S. (2004). The expression and regulation of negative emotions: Risk factors for young children's peer victimization. <i>Development And Psychopathology, 16</i> , 335-353.	Ranged in age from 32-75 months (M=52 months; N=126)	Parents and teachers	CBQ (Rothbart, et al., 2001)	<i>Anger/Frustration</i> (subset of 10 items)			
				Parent	4.47 (0.88)	4.59 (0.80)	.14
				Teacher	3.38 (1.08)	3.95 (1.07)	.53
				<i>Regulation</i> (Teacher-rated; attentional focusing, attentional shifting, and inhibitory control scales averaged together)			
					4.64 (0.63)	4.33 (0.67)	-.47
Gagne, J.R., Miller, M.M., & Goldsmith, H. (2013). Early—but modest—gender differences in focal aspects of	Age 36 months (N=714 twins; 357 pairs)	Mothers and fathers	CBQ (Rothbart, et al., 2001)	<i>Shyness</i>			
				Mother	.16 (.98)	-.18 (.96)	-.35
				Father	.07 (.98)	-.09 (.92)	-.17
				<i>Activity Level</i>			
				Mother	-.16 (1.02)	.19 (.93)	.36
				Father	-.18 (.98)	.18 (.93)	.38

childhood temperament. <i>Personality and Individual Differences</i> , 55, 95–100.				<i>Inhibitory Control</i> Mother Father	.21 (.94) .13 (.97)	-.17 (1.01) -.09 (.95)	-.39 -.23
Gusdorf, L. A., Karreman, A., van Aken, M. G., Dekovć, M., & van Tuijl, C. (2011). The structure of effortful control in preschoolers and its relation to externalizing problems. <i>British Journal Of Developmental Psychology</i> , 29, 612-634.	3-year-olds (N=89)	Mothers and fathers	CBQ (Rothbart, et al., 2001)	Inhibitory Control Hyperactivity Attentional Focusing Effortful Control	Means and SD's not reported by gender	Means and SD's not reported by gender	No significant gender differences found and were not reported
Sleddens, E. C., Kremers, S. J., Candel, M. M., De Vries, N. K., & Thijs, C. (2011). Validating the Children's Behavior Questionnaire in Dutch children: Psychometric properties and a cross-cultural	6- to 8-year-olds (M age=7.1 years; N=353)	Mothers and fathers	Dutch translation of the CBQ-SF (Sleddens et al., 2011; Putnam & Rothbart, 2006)	Surgency/Extraversion Negative Affectivity Effortful Control	Means and SD's not reported by gender	Means and SD's not reported by gender	No significant gender differences found and were not reported

comparison of factor structures. <i>Psychological Assessment, 23, 417-426.</i>							
Gouze, K. R., Lavigne, J. V., Hopkins, J., Bryant, F. B., & Lebailly, S. A. (2012). The relationship between temperamental negative affect, effortful control, and sensory regulation: A new look. <i>Infant Mental Health Journal, 33, 620-632.</i>	4-year-olds (N=391)	Mothers and fathers	CBQ (Rothbart, et al., 2001)	Negative Affectivity Effortful Control	Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute
Richard, H., Davis, D., & Bums, B. M. (2008). An evaluation of the Children's Behavior Questionnaire for use with children from low-income families. <i>Journal Of Early Childhood And Infant</i>	4- to 5-year-olds (N=100) and 3- to 7-year-olds (N=215); low-income children	Mothers and fathers	CBQ (Rothbart, et al., 2001)	Surgency/Extraversion Negative Affectivity Effortful Control	Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute



<i>Psychology, 4, 111-123.</i>							
Putnam, S. P., & Rothbart, M. K. (2006). Development of Short and Very Short Forms of the Children's Behavior Questionnaire. <i>Journal Of Personality Assessment, 87, 102-112.</i>	<i>Scale construction: 21-101 months of age (N=468)</i>  <i>Study 1: 38-83 months of age (N=590)</i>  <i>Study 2: 3- to 8-year olds (N=596)</i>	Mothers and fathers	CBQ-SF and Very Short Form (Putnam & Rothbart, 2006)	Surgency/Extraversion Negative Affectivity Effortful Control	Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute
Eggers, K., De Nil, L. F., & Van den Bergh, B. H. (2010). Temperament dimensions in stuttering and typically developing children. <i>Journal Of Fluency Disorders, 35, 355-372.</i>	3.04 to 8.11 years (M age = 5.11 years; N=116)	Mothers	CBQ (Rothbart, et al., 2001)	Surgency/Extraversion Negative Affectivity Effortful Control	Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute
Shanahan, M. M., Roberts, J. J.,	3-year-old boys with	Parent	CBQ (Rothbart, et	<i>Fragile X Boys</i> Anger/Frustration	No girls included in	4.09 (.48)	N/A

Hatton, D. D., Reznick, J. J., & Goldsmith, H. H. (2008). Early temperament and negative reactivity in boys with fragile X syndrome. <i>Journal Of Intellectual Disability Research, 52</i> , 842-854.	Fragile X Syndrome (N=25); 3-year old typically developing boys (N=64)		al., 2001)	Sadness	sample	3.71 (.82)		
				<i>Typically Developing Boys</i>				
				Anger/Frustration		4.30 (.20)		
				Sadness		4.32 (.18)		
Klein-Tasman, B. P., & Mervis, C. B. (2003). Distinctive personality characteristics of 8-, 9-, and 10-year-olds with Williams syndrome. <i>Developmental Neuropsychology, 23</i> , 269-290.	8- 9- and 10-year-olds with Williams Syndrome (N=23) and developmental disabilities of other etiologies (N=20)	Parent	CBQ-Long Form (Rothbart & Ahadi, 1994)	Surgency/Extraversion Negative Affectivity Effortful Control	Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute	
Putnam, S. P., Rothbart, M. K., & Gartstein, M. A. (2008). Homotypic and heterotypic continuity of fine-grained temperament	IBQ-R: 3-6, 6-9, and 9-12-month olds (N=361)  ECBQ: 18-22	Parents	IBQ-R (Gartstein & Rothbart, 2003); ECBQ (Putnam, et al., 2006); CBQ (Rothbart, et al., 2001)		Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute	

during infancy, toddlerhood, and early childhood. <i>Infant And Child Development</i> , 17, 387-405.	months (N=103), 23-26 months (N=110), 27-32 months (N=104)						
	CBQ: 4-year-olds (M age=49.51 months; N=187)						
Hughes, S. O., & Shewchuk, R. M. (2012). Child temperament, parent emotions, and perceptions of the child's feeding experience. <i>The International Journal Of Behavioral Nutrition And Physical Activity</i> , 9.	3- to 5-year-olds (N=639) in Head Start, 73% minorities	Parent	CBQ (Rothbart, et al., 2001)		Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute
Konstantareas, M., & Stewart, K. (2006). Affect Regulation and Temperament in Children with	3- to 10-years (M age=6.16; N=19) who were previously	Parents	CBQ (Goldsmith & Rothbart, 1991)		Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute

Autism Spectrum Disorder. <i>Journal Of Autism And Developmental Disorders</i> , 36, 143-154.	diagnosed with Autism Spectrum Disorder; 3- to 10-years who were typically developing (M age=6.37; N=23)							
DeThorne, L., Deater-Deckard, K., Mahurin-Smith, J., Coletto, M., & Petrill, S. (2011). Volubility as a mediator in the associations between conversational language measures and child temperament. <i>International Journal Of Language &amp; Communication Disorders</i> , 46, 700-713.	M age=7.17 years; N=161	Parents	CBQ-SF (Putnam & Rothbart, 2006)	Perceptual Sensitivity Sadness	Means and SD's not reported by gender	Means and SD's not reported by gender		-.48 -.41 (computed from t-scores)
Grist, C. L., & McCord, D. M.	35-72 months of	Teachers	CBQ Very Short Form		Means and SD's not	Means and SD's not		Could not compute

(2010). Individual differences in preschool children: Temperament or personality? <i>Infant And Child Development, 19,</i> 264-274.	age (M age=50.91 ; N=122)		(Putnam & Rothbart, 2006)		reported by gender	reported by gender	
Lemola, S., Raikkonen, K., Matthews, K. A., Scheier, M. F., Heinonen, K., Pesonen, A., & Lahti, J. (2010). A new measure for dispositional optimism and pessimism in young children. <i>European Journal Of Personality, 24,</i> 71-84.	M age=8.1 years; N=221	Mother and father pairs	CBQ (Rothbart, et al., 2001)		Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute
Healey, D. M., Brodzinsky, L. K., Bernstein, M., Rabinovitz, B., & Halperin, J. M. (2010). Moderating effects of neurocognitive	3- to 4- year-olds (M age=4.22 years; N=74)	Parents	CBQ (Rothbart, et al., 2001)		Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute

abilities on the relationship between temperament and global functioning. <i>Child Neuropsychology</i> , 16, 20-31.							
Deater-Deckard, K., Wang, Z., Chen, N., & Bell, M. (2012). Maternal executive function, harsh parenting, and child conduct problems. <i>Journal Of Child Psychology And Psychiatry</i> , 53, 1084-1091.	M age=57.29 months; N=147	Mothers	CBQ-SF (Putnam & Rothbart, 2006)	Activity Level Impulsivity Anger/Frustration	Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute
Komsi, N., Raikkonen, K., Heinonen, K., Pesonen, A., Keskiavaara, P., Jarvenpaa, A., & Strandberg, T. E. (2008). Continuity of father-rated temperament from infancy to middle	Time 1 (IBQ-R): M age=6.5 months; N=115  Time 2 (CBQ): M age=5.5 years; N=109	Fathers	IBQ-R (Gartstein & Rothbart, 2003); CBQ (Rothbart, et al., 2001)	<i>IBQ-R</i> Activity Level Smiling and Laughter Soothability Duration of Orienting Distress to Limitations Fear Positive Affectivity Negative Affectivity  <i>CBQ</i> Activity Level Anger/Frustration	4.60 (.71) 5.27 (.80) 4.89 (1.15) 4.10 (1.14) 3.07 (.69) 2.38 (.74) 4.71 (.67) 2.73 (.60)  4.80 (.71) 3.72 (.88)	4.57 (.69) 5.44 (.75) 4.74 (1.13) 4.00 (1.18) 3.04 (.72) 2.31 (.56) 4.69 (.66) 2.68 (.53)  4.82 (.80) 3.91 (.76)	-.04 .21 -.13 -.08 -.04 -.10 -.03 -.08  .02 .23

childhood. <i>Infant Behavior &amp; Development</i> , 31, 239-254.				Approach/Anticipation	5.12 (.49)	5.00 (.67)	-.20
				Attentional Focusing	5.18 (.71)	5.18 (.63)	0.0
				Discomfort	3.58 (.88)	3.54 (.81)	.04
				Falling	4.89 (.70)	5.09 (.63)	.30
				Reactivity/Soothability			
				Fear	3.51 (.86)	3.54 (.82)	.03
				High Intensity Pleasure	4.83 (.85)	5.06 (.72)	.29
				Impulsivity	4.44 (.68)	4.38 (.85)	-.07
				Inhibitory Control	5.04 (.78)	5.03 (.84)	-.01
				Low Intensity Pleasure	5.53 (.60)	5.46 (.55)	-.12
				Perceptual Sensitivity	5.21 (.64)	4.92 (.69)	-.43
				Sadness	3.50 (.66)	3.35 (.73)	-.21
				Shyness	3.14 (1.07)	3.29 (1.08)	.13
				Smiling and Laughter	5.69 (.70)	5.60 (.57)	-.14
				Extraversion/Surgency	4.96 (.53)	4.93 (.47)	-.05
				Effortful Control	5.24 (.50)	5.15 (.49)	-.18
				Negative Affectivity	3.48 (.60)	3.45 (.55)	-.05
Komsi, N., Raikkonen, K., Pesonen, A., Heinonen, K., Keskivaara, P., Jarvenpaa, A., & Strandberg, T. E. (2006). Continuity of temperament from infancy to middle childhood. <i>Infant Behavior &amp; Development</i> , 29(4), 494-508.	Time 1 (IBQ-R): M age=6.3 months; N=231	Mothers	IBQ-R (Gartstein & Rothbart, 2003); CBQ (Rothbart, et al., 2001)	<i>IBQ-R</i> Activity Level	4.32 (.72)	4.66 (.81)	.44
				Smiling and Laughter	5.14 (.84)	5.27 (.91)	.14
				Soothability	4.98 (1.04)	4.88 (1.07)	-.09
				Duration of Orienting	3.80 (1.12)	3.74 (1.17)	-.05
				Distress to Limitations	3.04 (.79)	3.00 (.72)	-.05
				Fear	2.27 (.64)	2.13 (.65)	-.21
				Positive Affectivity	4.64 (.75)	4.63 (.83)	-.01
				Negative Affectivity	2.65 (.61)	2.56 (.55)	-.15
				<i>CBQ</i> Activity Level	4.64 (.80)	4.83 (.85)	.23
				Anger/Frustration	3.88 (.87)	3.94 (.98)	.06
				Approach/Anticipation	5.31 (.56)	5.28 (.63)	-.05
				Attentional Focusing	5.13 (.73)	4.97 (.81)	-.20
				Discomfort	3.76 (.99)	3.65 (.94)	-.11
				Falling	5.01 (.77)	5.07 (.71)	.08
				Reactivity/Soothability			
				Fear	3.74 (.99)	3.61 (.97)	-.13

				High Intensity Pleasure	4.86 (.90)	5.20 (.92)	.37
				Impulsivity	4.26 (.91)	4.36 (.89)	.11
				Inhibitory Control	5.13 (.88)	4.90 (.90)	-.25
				Low Intensity Pleasure	5.79 (.59)	5.61 (.66)	-.28
				Perceptual Sensitivity	5.55 (.72)	5.13 (.79)	-.55
				Sadness	3.66 (.84)	3.44 (.83)	-.26
				Shyness	3.29 (1.09)	3.25 (1.22)	-.03
				Smiling and Laughter	5.80 (.62)	5.85 (.62)	.08
				Extraversion/Surgency	4.93 (.57)	5.04 (.57)	.19
				Effortful Control	5.40 (.50)	5.15 (.60)	-.45
				Negative Affectivity	3.60 (.69)	3.52 (.65)	-.11
Pesonen, A., Raikkonen, K., Kajantie, E., Heinonen, K., Strandberg, T. E., & Jarvenpaa, A. (2006). Fetal Programming of Temperamental Negative Affectivity Among Children Born Healthy at Term. <i>Developmental Psychobiology</i> , 48, 633-643.	Ma ge=5.5 years; N=416	Mothers	CBQ (Rothbart, et al., 2001)	Fear	3.70 (1.09)	3.62 (.96)	-.07
				Discomfort	3.77 (.95)	3.61 (.93)	-.16
				Anger	3.81 (.85)	4.04 (.90)	.26
				Sadness	3.66 (.85)	3.48 (.77)	-.22
				Negative Affectivity	3.74 (.72)	3.69 (.65)	-.06
Luciana, M., Gunnar, M. R., Davis, E. P., Nelson, C. A., & Donzella, B. (2005). Children's 'catastrophic	Unavailab le	Mothers or fathers	CBQ (Rothbart, et al., 2001)		Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute



responses' to negative feedback on CANTAB's ID/ED set-shifting task: Relation to indices of a depressive temperamental style. *Cogniție Creier Comportament*, 9, 343-361.

Wolfe, C. D., & Bell, M. (2004). Working Memory and Inhibitory Control in Early Childhood: Contributions from Physiology, Temperament, and Language. <i>Developmental Psychobiology</i> , 44, 68-83.	52-56 months of age; N=20	Mothers	CBQ (Rothbart, et al., 2001)	Means and SD's not reported by gender	Means and SD's not reported by gender	Could not compute
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**Appendix B: Gender Differences in SC Literature Review Table**

Citation	Age and N	Informant	Measures	Dimension Measured	Results		
					Girls Mean (SD)	Boys Mean (SD)	Cohen's <i>d</i> Effect Size
Butovskaya, M.L. & Demianovitsch, A.N. (2002): Social Competence and Behavior Evaluation (SCBE-30) and Socialization Values (SVQ): Russian Children Ages 3 to 6 Years, <i>Early Education &amp; Development</i> , 13, 153-170.	3-6 years; N=217	Teachers	SCBE-30 (LaFreniere & Dumas, 1992; LaFreniere & Dumas, 1996)	<i>Social Competence</i>			
				3-year-olds	35.00 (11.33)	35.25 (9.60)	.02
				4-year-olds	36.42 (6.81)	35.42 (7.02)	-.14
				5-year-olds	42.68 (6.67)	37.82 (7.57)	-.68
				6-year-olds	42.42 (10.93)	39.13 (7.32)	-.35
Bigras, M. & Auxiliadora Dessen, M. (2002): Social Competence and Behavior Evaluation in Brazilian Preschoolers, <i>Early Education &amp; Development</i> , 13, 139-152.	4-6 years; N=401	Teachers	SCBE (LaFreniere & Dumas, 1992)	Social Competence	3.89 (1.19)	3.31 (1.04)	-.49
Kranzelic, V., & Basic, J. (2008).	3-6.5 years;	Teachers	SCBE (LaFreniere	Social Competence	No means or SDs reported	No means or SDs reported	Could not compute

Social competence and behavior of preschool children – Gender differences. <i>Kriminologija &amp; Socijalna Integracija, 16, 1-14.</i>	N=445		& Dumas, 1992)				
Zhang, X. (2011). The development of social competence during early childhood: A latent growth model. <i>Acta Psychologica Sinica, 43, 1388-1397.</i>	3-5 years of age; N=119	Mothers	Full text unavailable in English	Unavailable	Unavailable	Unavailable	Could not compute
Griggs, M., Gagnon, S., Huelsman, T. J., Kiddler-Ashley, P., & Ballard, M. (2009). Student-teacher relationships matter: Moderating influences between temperament and preschool social	40-68 months, N=44	Mothers	Penn Interactive Peer Play Scale (PIPPS; Fantuzzo, Coolahan, Mendez, McDermott, & Sutton-Smith, 1998)	Play Interaction Play Disruption Play Disconnection	Means and SDs not reported by gender	Means and SDs not reported by gender	Could not compute

competence. <i>Psychology In The Schools, 46, 553-567.</i>							
Walker, S. (2005). Gender Differences in the Relationship Between Young Children's Peer-Related Social Competence and Individual Differences in Theory of Mind. <i>The Journal Of Genetic Psychology: Research And Theory On Human Development, 166, 297-312.</i>	3- to 5-year-olds; N=111	Teachers	Profile of Peer Relations (PPR; Walker, Berthelsen, & Irving, 2000)	3- to 4-Year-Olds Aggressive/Disruptive Behavior Prosocial Behavior Shy/Withdrawn Behavior  4- to 5-Year-Olds Aggressive/Disruptive Behavior Prosocial Behavior Shy/Withdrawn Behavior	1.21 (.37) 2.67 (.59) 1.92 (.59)  1.24 (.48) 1.68 (.41) 1.95 (.44)	1.40 (.50) 2.77 (.61) 2.07 (.50)  2.01 (.73) 3.20 (.45) 1.68 (.41)	.43 .16 .27  1.24 3.53 -.63
Booth-LaForce, C., & Oxford, M. L. (2008). Trajectories of social withdrawal from grades 1 to 6: Prediction from early parenting, attachment, and temperament. <i>Developmental Psychology, 44,</i>	54 months of age; N=1,092	Teachers	Social Skills Rating System (SSRS; Gresham & Elliott, 1990)	Self-Control Scale only	Means and SDs not reported	Means and SDs not reported	d=-.16

1298-1313.							
Henricsson, L., & Rydell, A. (2004). Elementary school children with behavior problems: Teacher-child relations and self-perception. A prospective study. <i>Merrill-Palmer Quarterly</i> , 50(2), 111-138. doi:10.1353/mpq.2004.0012	Age=7.5 years; N=95	Teachers	Social Competence Inventory (SCI; Rydell, Hagekull, & Bohlin, 1997)	Prosocial Orientation	Means and SDs not reported	Means and SDs not reported	d=-.52 (computed from t score)
Zhou, Q., Eisenberg, N., Wang, Y., & Reiser, M. (2004). Chinese Children's Effortful Control and Dispositional Anger/Frustration : Relations to Parenting Styles and Children's Social Functioning. <i>Developmental Psychology</i> , 40, 352-366.	N=425; M age=92 months	Parents, teachers, peers	Parent and teacher ratings: Harter's Perceived Competence Scale for Children (Eisenberg, Valiente, Fabes, 2003; Harter & Pike, 1984); Peer ratings: Chinese Version of the Revised Class Play	<i>Children's Social Functioning</i> Parent Teacher <i>Aggression</i> (Peer rating) <i>Leadership/Sociability</i> (Peer rating)	.11 (.84) .04 (.53) -.29 (.33) .20 (.87)	-.16 (.83) -.01 (.91) .28 (1.01) -.13 (.65)	-.32 -.06 .76 -.43

			(RCP; Masten, Morison, & Pelligrini, 1985; Chen, Rubin, & Sun, 1992)				
Spinrad, T. L., Eisenberg, N., Cumberland, A., Fabes, R. A., Valiente, C., Shepard, S. A., Reiser, M., Losoya, S.H., & Guthrie, I. K. (2006). Relation of emotion-related regulation to children's social competence: A longitudinal study. <i>Emotion</i> , 6, 498-510.	Ages 4.5-7.9 years	Mothers and teachers	7-item scale from an adapted version of Harter's Perceived Competence Scale for Children (Eisenberg, Valiente, & Fabes, 2003; Harter & Pike, 1984)	<i>Time 1 Socially Appropriate Behavior</i>			
				Mother	3.23 (.56)	2.98(.71)	-.39
				Teacher	3.44 (.61)	2.95 (.83)	-.67
		<i>Time 1:</i> Girls M age=74.58 months,					
		Boys M age=72.58 months		<i>Time 2 Socially Appropriate Behavior</i>			
		(N=214)		Mother	3.27 (.50)	3.05 (.71)	-.36
		<i>Time 2:</i> Girls M age=7.72 years,		Teacher	3.42 (.63)	2.90 (.78)	-.73
		Boys M age=7.61 years (N=193)					
Julvez, J., Forns, M., Ribas-Fito, N., Mazon, C., Torrent, M., Garcia-Esteban, R., & Sunyer, J. (2008). Psychometric	Assessed at 4.5 years; N=378	Teachers	California Preschool Social Competence Scale (CPSCS; Levin, Elzey, & Lewis,	Global Score Considerateness Task Orientation Extraversion Verbal Facility Response to Unfamiliar	<i>Median and range:</i> 97 (55-114) 21 (9-24) 25 (11-32) 14 (2-20) 15 (7-16) 9 (4-12)	<i>Median and range:</i> 89 (48-116) 19 (7-24) 23(9-32) 14 (6-20) 14 (7-16) 9 (4-12)	Could not compute

characteristics of the California Preschool Social Competence Scale in a Spanish population sample. <i>Early Education And Development, 19, 795-815.</i>			1969)					
Kotler, J. C., & McMahon, R. J. (2002). Differentiating anxious, aggressive and socially competent preschool children: Validation of the Social Competence and Behavior Evaluation-30 (parent version). <i>Behaviour Research And Therapy, 40, 947-959.</i>	M age=4.29 years; N=218	Parents	SCBE-30, Parent Version (Kotler & McMahon, 2002)	Social Competence	42.1 (5.2)	38.2 (5.8)		-.71

## Appendix C: Skewness

The skewness coefficient is a measure of the current sample's skewness and was calculated with SPSS using the following formula:  $g_1 = \sum \frac{((x-\bar{x})/SD)(3 \times n)}{((n-1) \times (n-2))}$  where  $x$  = each individual number in the sample,  $\bar{x}$  = average of the numbers in the sample,  $n$  = number in the sample, and  $SD$  = standard deviation of the sample. Bulmer (1979) suggests the following guideline for interpreting the skewness coefficient: if skewness is  $< -1.0$  or  $> +1.0$ , the distribution is highly skewed. If skewness is between  $-1.0$  and  $-0.5$  or between  $+0.5$  and  $+1.0$ , the distribution is moderately skewed. If skewness is between  $-0.5$  and  $+0.5$ , the distribution is approximately symmetric. Also, as a guideline, a skewness value more than twice its standard error is considered to indicate a departure from symmetry (SPSS Software Help Menu, 2014).

In order to determine whether the population is skewed too much to be due to random chance and whether there is skewness in the population, the Z-score should be calculated and interpreted. The Z-score is a measure of the entire population's probability of skew and was computed by hand with the following formula:  $Z = \frac{\text{Skewness Coefficient } g_1 - 0}{SE_{\text{Skewness}}}$  (Cramer, 1998; Joanes & Gill, 1998). If  $Z$  is  $< -2.0$ , the population is very likely skewed negatively. If  $Z$  is  $> +2.0$ , the population is very likely skewed positively. If  $Z$  is between  $-2.0$  and  $+2.0$ , no conclusion can be made regarding skewness in the population and it could be skewed in either direction or symmetrical.

### Skewness on the CBQ and CBQ-T

**CBQ.** On the CBQ, five scales resulted in large Z-scores indicating a high likelihood of skew in the population (Table 1). Attentional Focusing ( $Z = -2.47, -2.06$ ), Inhibitory Control ( $Z = -2.68, -3.22$ ), and Perceptual Sensitivity ( $Z = -2.55, -2.78$ ) was negatively skewed for both



boys and girls, respectively, meaning that more boys and girls fell in the upper end of the distribution. Approach/Positive Anticipation ( $Z = -2.06$ ) was only skewed for girls with more girls falling in the upper end of the distribution, and Smiling and Laughter was only skewed for boys ( $Z = -2.21$ ) with more boys falling in the upper limits. These histograms with a normal curve overlay are depicted below in Figures 1 through 8.

On the CBQ, Impulsivity ( $g_1 = -.35, .39$ ), Sadness ( $g_1 = -.31, .14$ ), and Shyness ( $g_1 = .24, -.15$ ) were skewed in opposite directions for boys and girls, respectively. Impulsivity and Sadness were negatively skewed for boys, though positively skewed for girls. For Shyness, the scale was positively skewed for boys and negatively skewed for girls. None of these skewness coefficients were significantly skewed and they were still normally distributed.

**CBQ-T.** On the CBQ-T, five scales also resulted in large Z-scores indicating a high likelihood of skew in the population (Table 2). Activity Level ( $Z = 2.57$ ), Attentional Focusing ( $Z = -2.20$ ), Falling Reactivity/Soothability ( $Z = -2.47$ ), and Smiling and Laughter ( $Z = -2.63$ ) were only skewed for girls. All were negatively skewed with more girls falling in the upper limits, except for Activity Level which was positively skewed and had more girls in the lower limits. Sadness ( $Z = 2.10$ ) was only skewed for boys and was skewed positively with more boys in the lower end of the distribution. These histograms with a normal curve overlay are depicted below in Figures 9 through 13.

Attentional Focusing was common to both raters in that it was negatively skewed. However, for parent raters, both gender groups had more scores that fell in the upper end of the distribution, whereas, for teacher raters, only girls had more scores in the upper limits. Smiling and Laughter was also negatively skewed for both raters, though for parents, more boys fell in

the upper limits, and for teachers, the opposite was true with more girls falling in the upper end of the distribution.

On the CBQ-T, six scales were skewed in opposite directions based on gender compared to only three on the CBQ. Activity Level ( $g_1 = -.41, .77$ ), Anger/Frustration ( $g_1 = -.06, .34$ ), Approach/Positive Anticipation ( $g_1 = -.34, .44$ ), High Intensity Pleasure ( $g_1 = -.44, .28$ ), and Impulsivity ( $g_1 = -.29, .20$ ) were all negatively skewed for boys, yet positively skewed for girls. Low Intensity Pleasure ( $g_1 = .27, -.22$ ) was positively skewed for boys and negatively skewed for girls. However, the only scale of these that appears to be significantly skewed is Activity Level (girls  $Z=2.57$ ) with more girls falling in the upper limits compared to boys. For the others, however, the values are within the range of what is considered a reasonable approximation to the normal curve.

Table 1

*Skewness of CBQ Variables by Gender*

Scale	Group			
	Boys		Girls	
	Skewness ( $g_1$ ) ( $SE=.34$ )	Z-score	Skewness ( $g_1$ ) ( $SE=.32$ )	Z-score
Activity Level	.02	.06	-.05	-.15
Anger/Frustration	-.08	-.24	-.27	-.84
Approach/Positive Anticipation	-.11	-.32	-.66	-2.06
Attentional Focusing	-.84	-2.47	-.66	-2.06
Discomfort	.16	.47	.18	.56
Falling Reactivity/Soothability	-.63	-1.85	-.22	-.69
Fear	.01	.03	-.12	-.38
High Intensity Pleasure	-.22	-.65	-.26	-.81
Impulsivity	-.35	-1.03	.39	1.22
Inhibitory Control	-.91	-2.68	-1.03	-3.22
Low Intensity Pleasure	-.54	-1.59	-.42	-1.31
Perceptual Sensitivity	-.87	-2.55	-.89	-2.78
Sadness	-.31	-.91	.14	.44
Shyness	.24	.71	-.15	-.47
Smiling & Laughter	-.75	-2.21	-.13	-.41

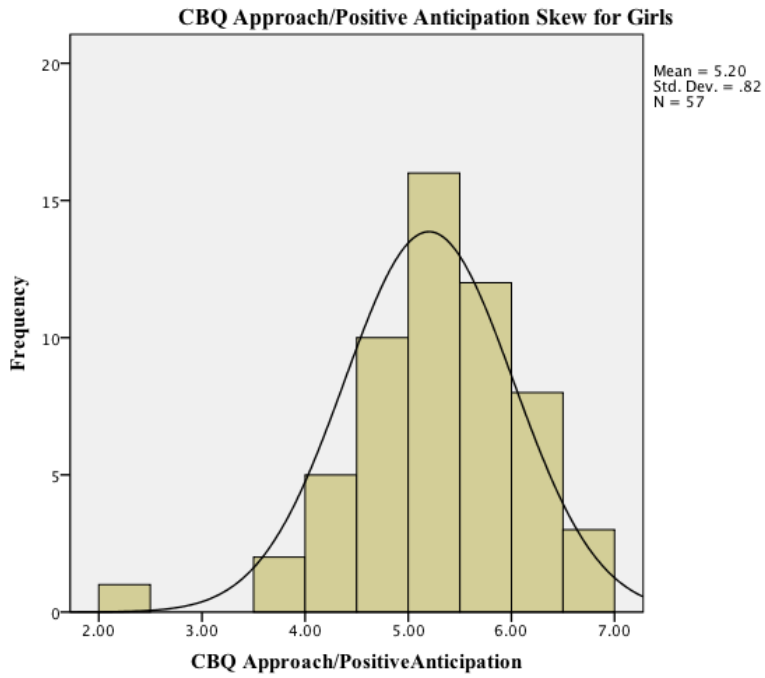


Figure 1.

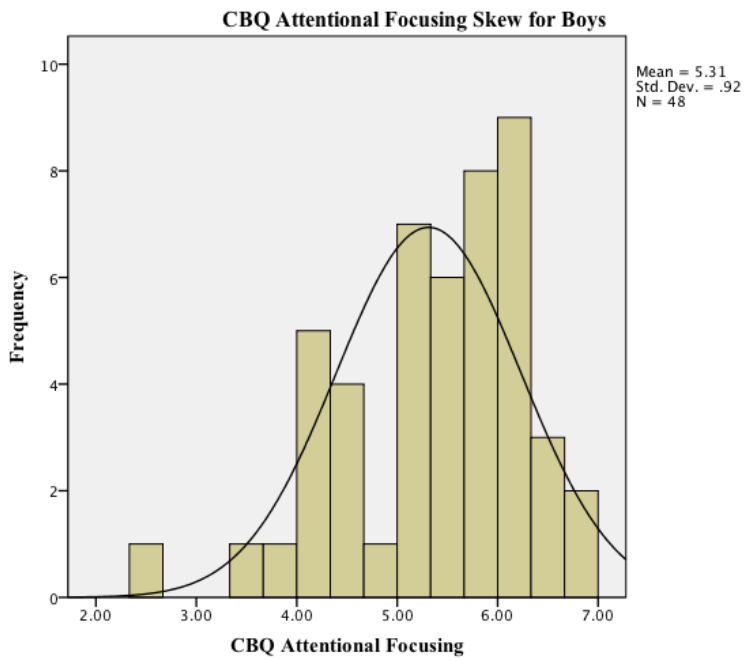


Figure 2.

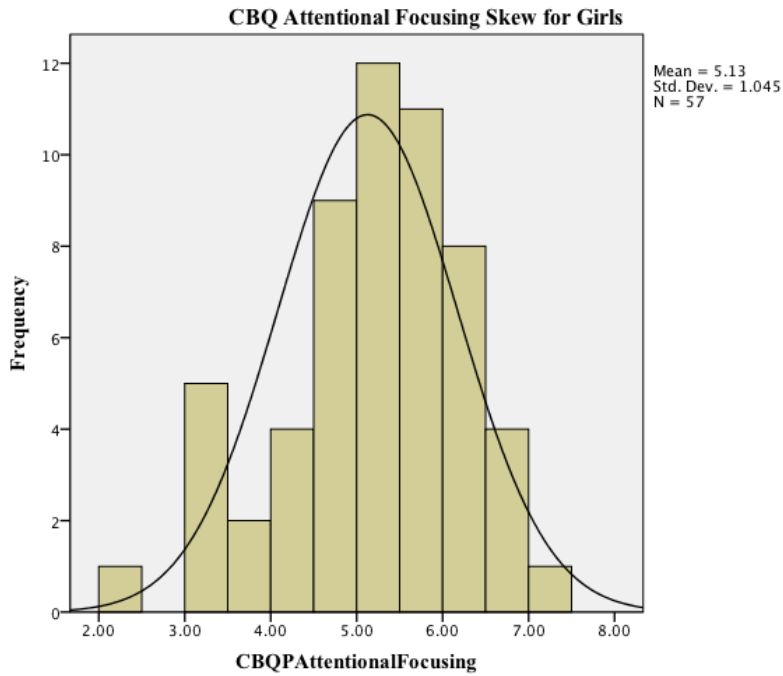


Figure 3.

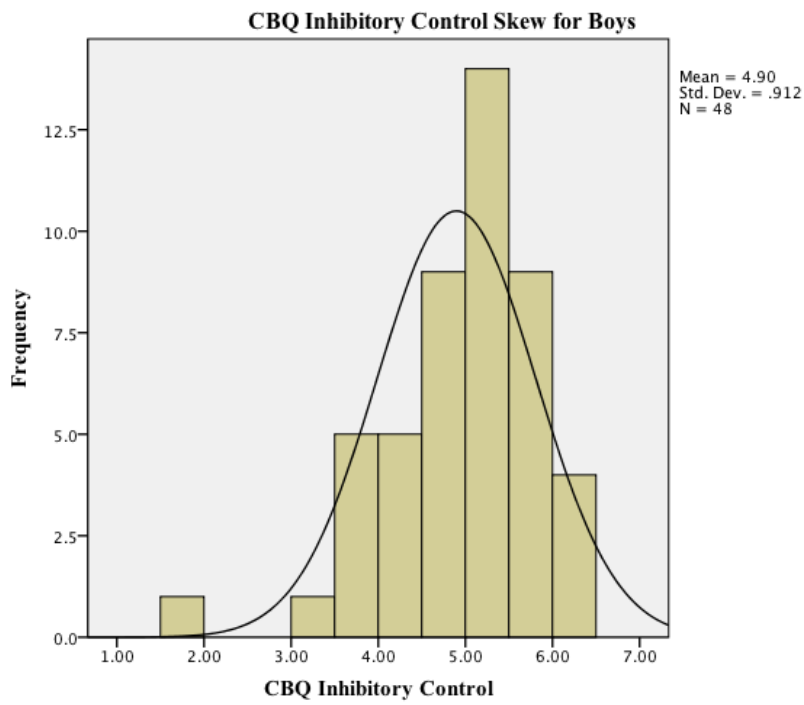


Figure 4.

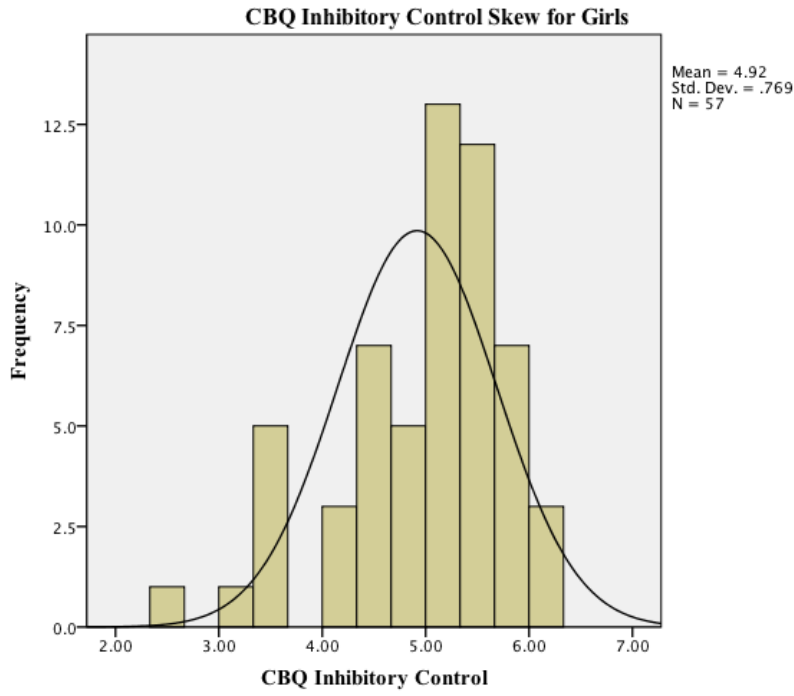


Figure 5.

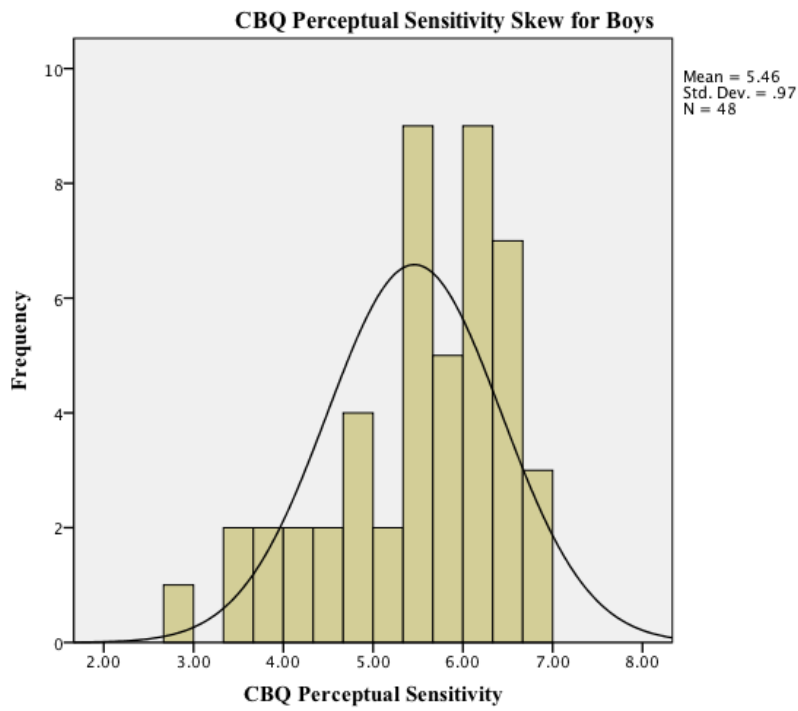


Figure 6.

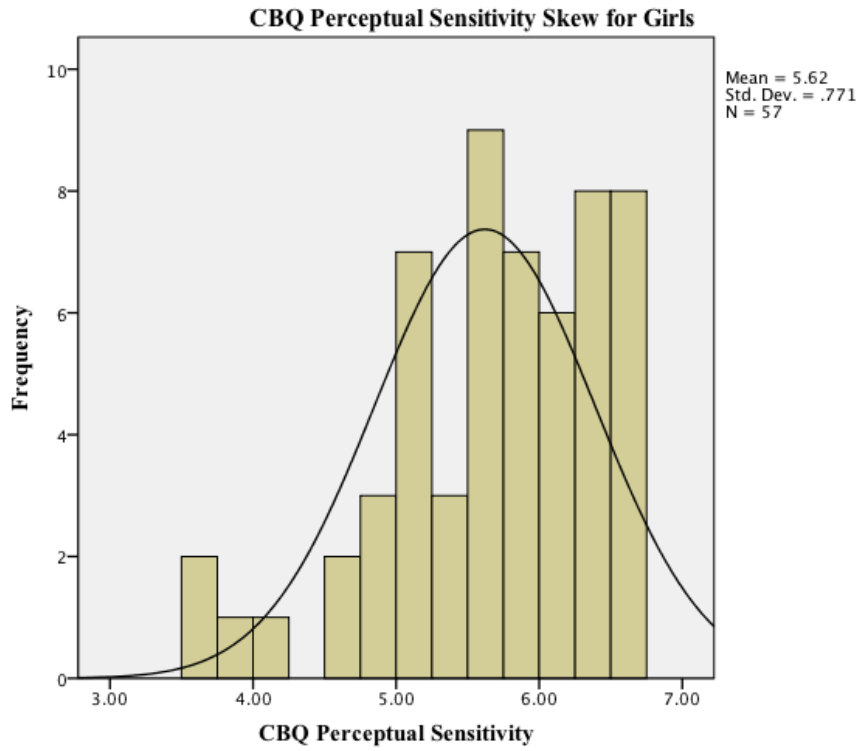


Figure 7.

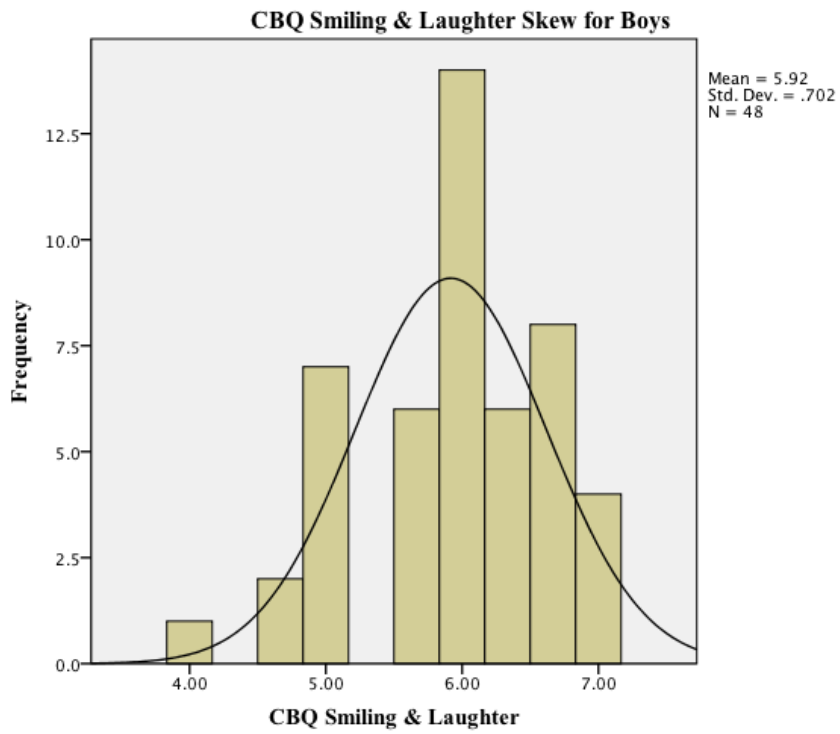


Figure 8.

Table 2

*Skewness of CBQ-T Variables by Gender*

Scale	Group			
	Boys		Girls	
	Skewness ( $g_1$ ) ( $SE=.30$ )	Z-score	Skewness ( $g_1$ ) ( $SE=.30$ )	Z-score
Activity Level	-.41	-1.37	.77	2.57
Anger/Frustration	-.06	-.20	.34	1.13
Approach/Positive Anticipation	-.34	-1.13	.44	1.47
Attentional Focusing	-.48	-1.60	-.66	-2.20
Discomfort	.55	1.83	.07	.23
Falling Reactivity/Soothability	-.50	-1.67	-.74	-2.47
Fear	.37	1.23	.16	.53
High Intensity Pleasure	-.44	-1.47	.28	.93
Impulsivity	-.29	-.97	.20	.67
Inhibitory Control	-.43	-1.43	-.34	-1.13
Low Intensity Pleasure	.27	.90	-.22	-.73
Perceptual Sensitivity	-.24	-.80	-.64	-2.13
Sadness	.63	2.10	.24	.80
Shyness	.09	.30	.02	.07
Smiling & Laughter	-.50	-1.67	-.79	-2.63



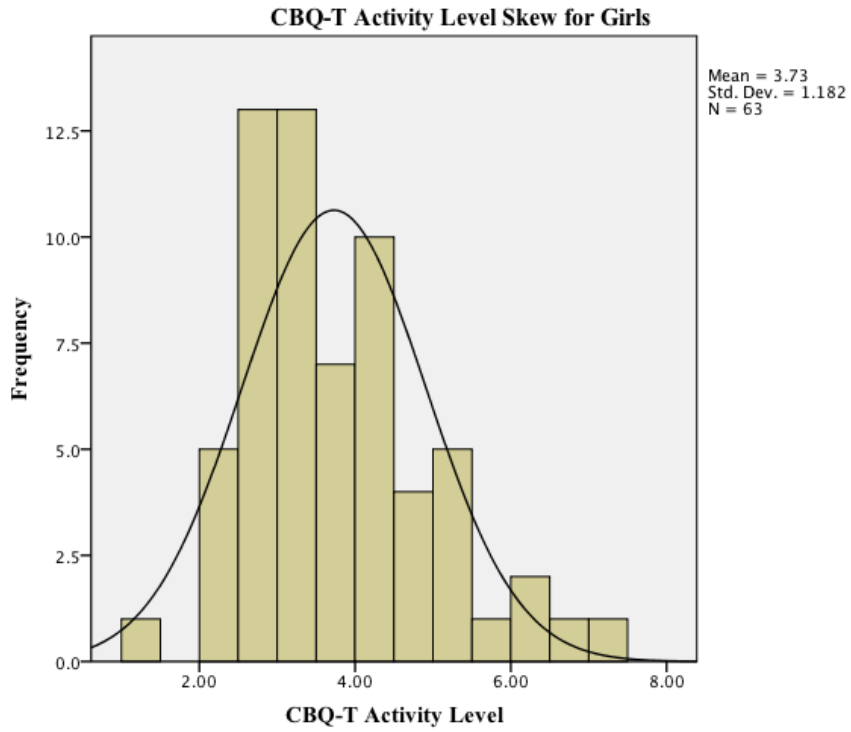


Figure 9.

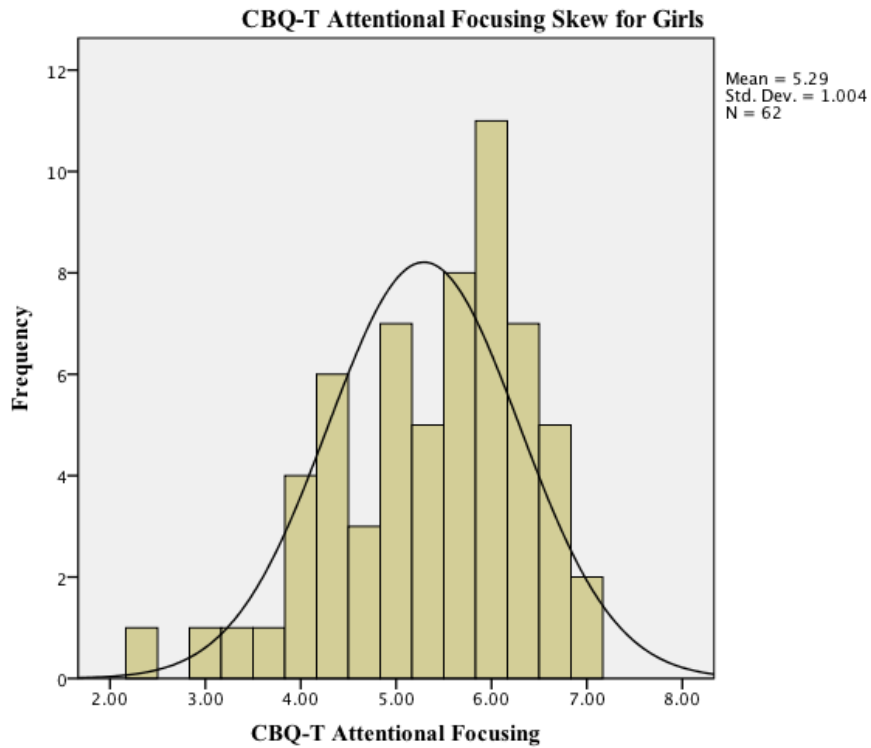


Figure 10.

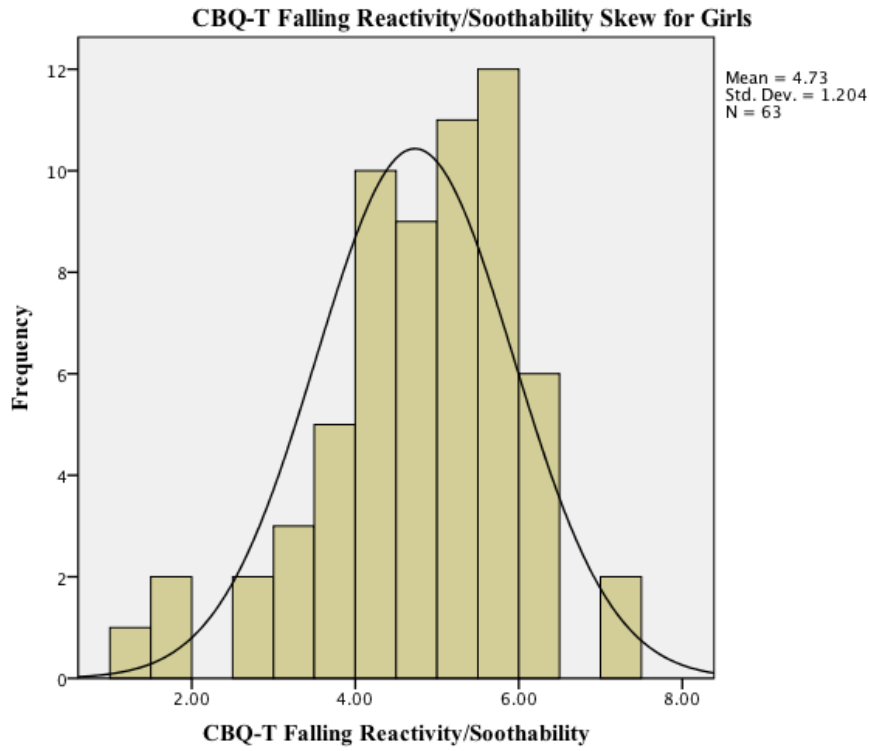


Figure 11.

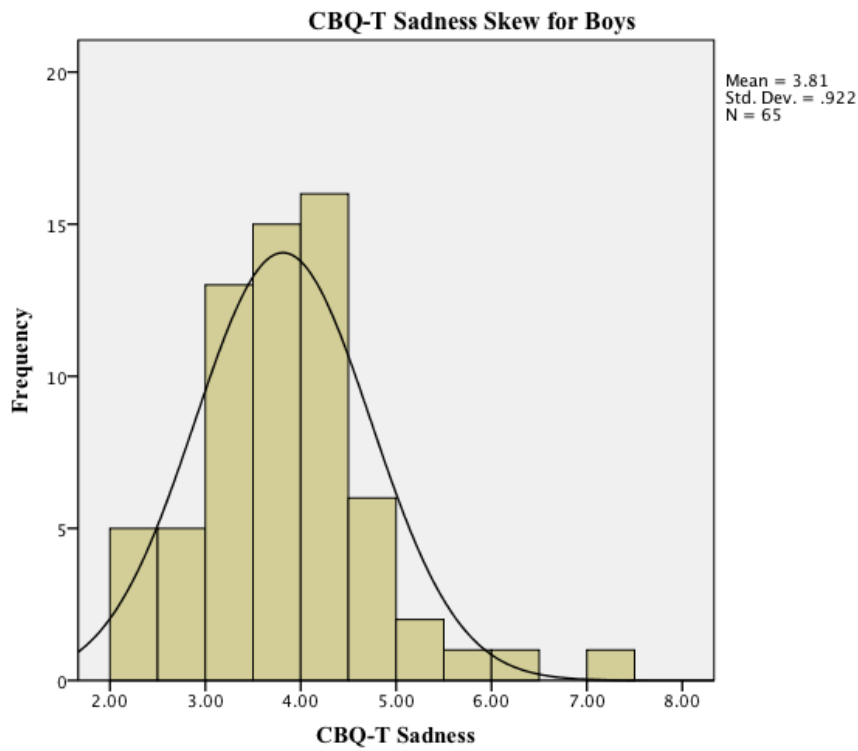


Figure 12.

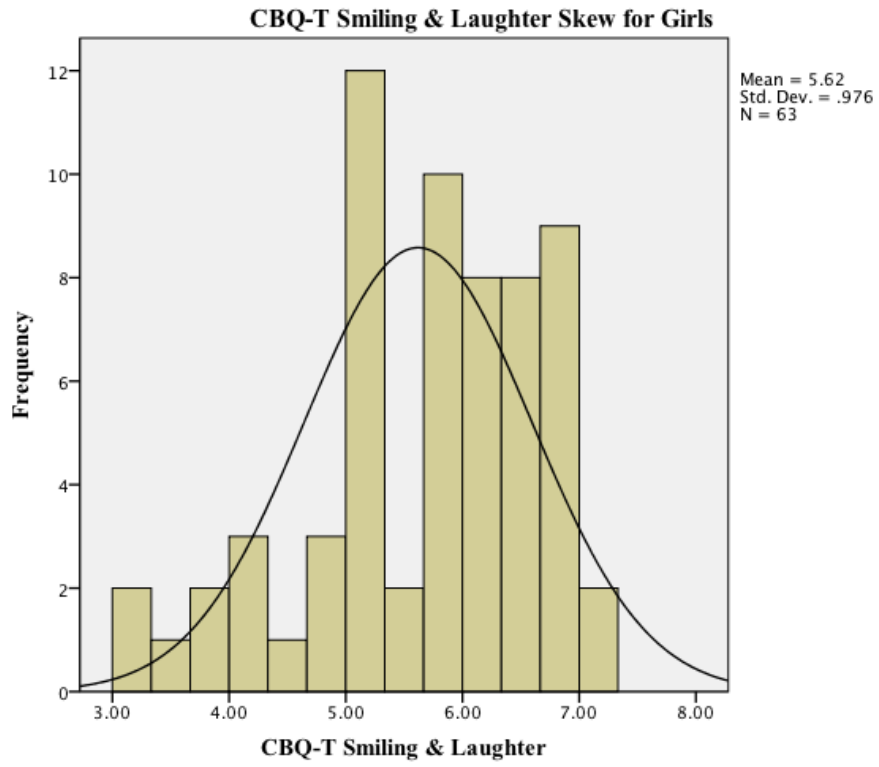


Figure 13.

## Skewness on the SCBE

**T-scores and raw scores.** None of the  $Z$ -scores indicated the likelihood that the population was skewed on any of the SCBE scales when using T-scores (Table 3). However, when using raw scores (Table 4), three scales (Figures 14-16) resulted in large  $Z$ -scores indicating a high likelihood of skew in the population on the scales of Isolated-Integrated (negatively skewed for boys;  $Z = -2.57$ ), Aggressive-Calm (negatively skewed for girls;  $Z = -2.10$ ), and Oppositional-Cooperative (negatively skewed for girls;  $Z = -3.39$ ). More boys fell in the Integrated end of the distribution compared to the Isolated pole, and more girls fell in the Calm and Cooperative ends of the scale compared to the Aggressive and Oppositional ends of the distributions. The fact that significant skew did not surface when T-scores were used, but did when raw scores were used, aligns with the hypothesis that T-scores may mask some gender differences and the use of raw scores sheds light on the distribution of gender differences.

When using raw scores, Angry-Tolerant ( $g_1 = .00, -.25$ ) and Egotistical-Prosocial ( $g_1 = .03, -.55$ ) were skewed in opposite directions for boys and girls, respectively, with more positive skew for boys and more negative skew for girls. For T-scores, five scales were skewed in opposite directions based on gender. Depressive-Joyful ( $g_1 = .02, -.15$ ), Aggressive-Calm ( $g_1 = .52, -.06$ ), Egotistical-Prosocial ( $g_1 = .41, -.12$ ), and Social Competence ( $g_1 = .04, -.31$ ) were more positively skewed for boys and negatively skewed for girls. More girls fell in the positive pole of the dichotomy (e.g., Joyful, Calm, Prosocial, and higher on Social Competence) compared to boys who tended to fall on the negative pole (e.g., Depressive, Aggressive, Egotistical, and lower on Social Competence). This supports gender differences for girls being rated higher on traits of social competence compared to boys. Dependent-Autonomous ( $g_1 = -.19, .11$ ) was negatively skewed for boys and positively skewed for girls indicating more boys on the Autonomous end of

the distribution and more girls on the Dependent pole. This scale measures teacher-child interactions and may indicate different interactions between teachers and students based on gender. Boys may be socialized to be more independent in the classroom, whereas girls may be viewed as more reliant on adults and likely to ask for help. However, none of these skewness coefficients were significantly skewed and they were still normally distributed.

Table 3

*Skewness of SCBE T-Scores by Gender*

Scale	Gender			
	Boys		Girls	
	Skewness ( $g_1$ ) ( $SE=.30$ )	Z-score	Skewness ( $g_1$ ) ( $SE=.31$ )	Z-score
Depressive-Joyful	.02	.07	-.15	-.48
Anxious-Secure	-.17	-.57	-.23	-.74
Angry-Tolerant	.54	1.80	.28	.90
Isolated-Integrated	-.12	-.40	-.11	-.35
Aggressive-Calm	.52	1.73	-.06	-.19
Egotistical-Prosocial	.41	1.37	-.12	-.39
Oppositional-Cooperative	.31	1.03	.08	.26
Dependent-Autonomous	-.19	-.63	.11	.35
Social Competence	.04	.13	-.31	-1.00

Table 4

*Skewness of SCBE Raw Scores by Gender*

Scale	Gender			
	Boys		Girls	
	Skewness ( $g_1$ ) ( $SE=.30$ )	Z-score	Skewness ( $g_1$ ) ( $SE=.31$ )	Z-score
Depressive-Joyful	-.22	-.73	-.42	-1.35
Anxious-Secure	-.45	-1.50	-.51	-1.65
Angry-Tolerant	.00	0	-.25	-.80
Isolated-Integrated	-.77	-2.57	-.57	-1.84
Aggressive-Calm	-.05	-.17	-.65	-2.10
Egotistical-Prosocial	.03	.10	-.55	-1.77
Oppositional-Cooperative	-.30	-1.00	-1.05	-3.39
Dependent-Autonomous	-.45	-1.50	-.52	-1.68
Social Competence	-.04	-.13	-.40	-1.29

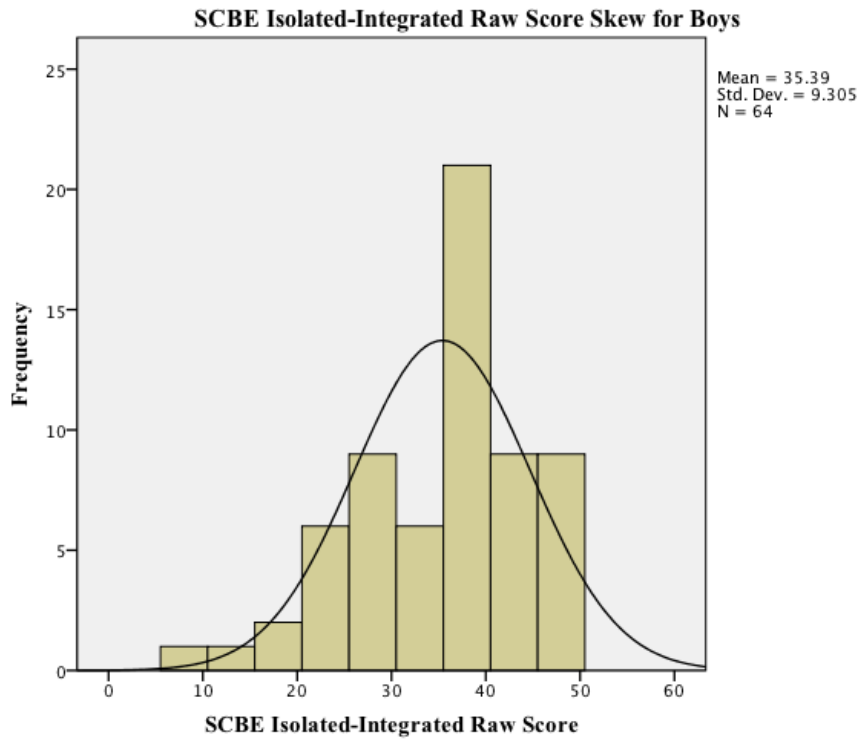


Figure 14.

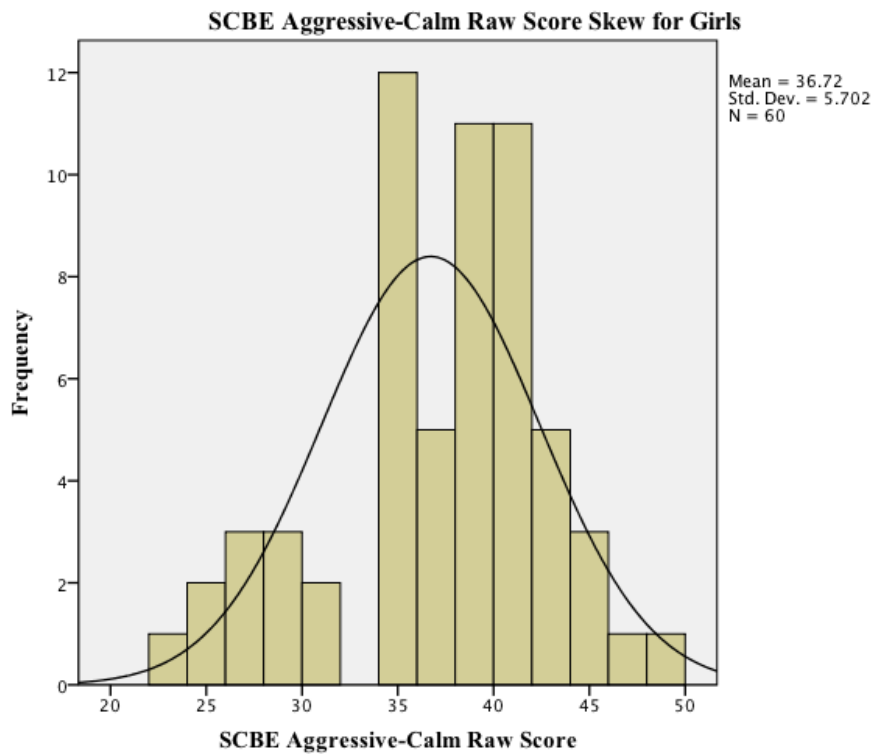


Figure 15.



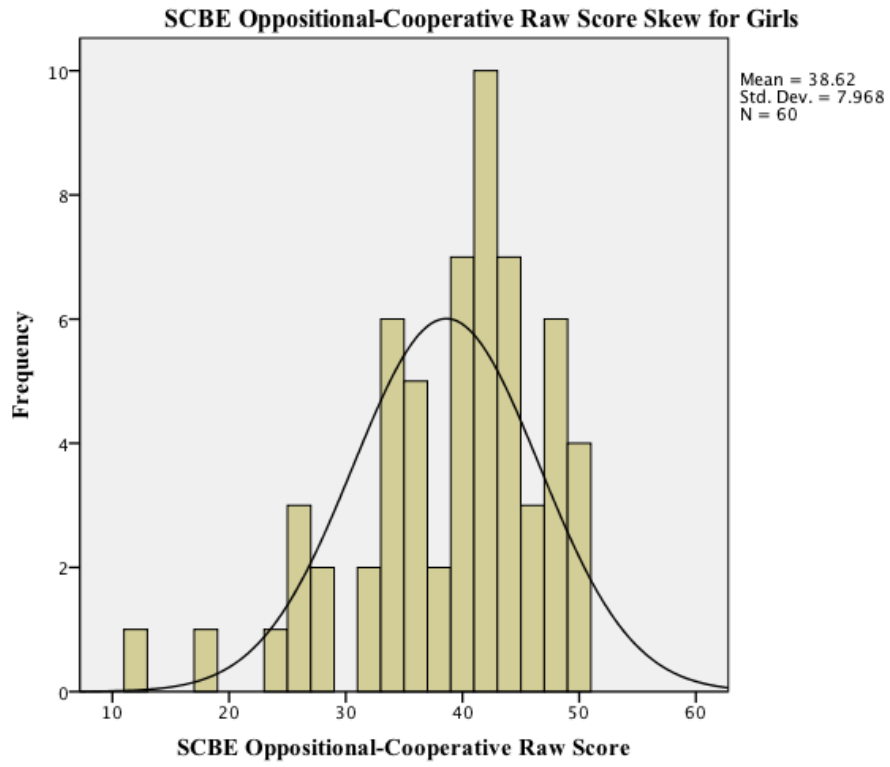


Figure 16.

## **Appendix D: Chi-Square Follow-Up Tests to Compare Differences Between Tertiles**

Chi-square follow-up tests were conducted to compare differences between tertiles in all possible combinations (e.g., compared Tertiles 1 to 2, 2 to 3, and 1 to 3) for those scales that yielded initial significant chi-square statistics on the CBQ, CBQ-T, and SCBE. Both raw scores and T-scores were considered on the SCBE, though no significant differences were yielded in the original chi-square analyses for T-scores, so no follow-up tests were conducted and only raw score follow-up tests are outlined below.

Table 1

*2 x 2 Follow-Up Chi-Square Analyses Comparing the Proportion of Boys and Girls Between Tertiles on the CBQ Scales*

	Tertile 1 (Below the Mean)		Tertile 2 (Around the Mean)		Tertile 3 (Above the Mean)		$\chi^2$	df	p-value
	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)			
Impulsivity	12(25)	25(44)	13(27)	17(30)			.84	1	.36
Impulsivity			13(27)	17(30)	23(48)	15(26)	1.99	1	.16
Impulsivity	12(25)	25(44)			23(48)	15(26)	5.95	1	.01*

\* $p < .05$ . \*\* $p < .01$ .

Note. % indicates percentage of each gender group.

Table 2

*2 x 2 Follow-Up Chi-Square Analyses Comparing the Proportion of Boys and Girls Between Tertiles on the CBQ-T Scales*

	Tertile 1 (Below the Mean)		Tertile 2 (Around the Mean)		Tertile 3 (Above the Mean)		$\chi^2$	df	p-value
	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)			
Activity Level	15(23)	26(41)	16(25)	26(41)			.02	1	.89
Activity Level			16(25)	26(41)	34(52)	11(18)	12.47	1	.00**
Activity Level	15(23)	26(41)			34(52)	11(18)	12.45	1	.00**
Attentional Focusing	25(39)	17(27)	26(41)	20(32)			.08	1	.78
Attentional Focusing			26(41)	20(32)	13(20)	25(40)	4.17	1	.04*
Attentional Focusing	25(39)	17(27)			13(20)	25(40)	5.13	1	.02*
High Intensity Pleasure	15(23)	29(46)	15(23)	25(40)			.11	1	.75
High Intensity Pleasure			15(23)	25(40)	35(54)	9(14)	15.37	1	.00**
High Intensity Pleasure	15(23)	29(46)			35(54)	9(14)	18.53	1	.00**
Impulsivity	17(26)	25(40)	19(29)	24(38)			.12	1	.73
Impulsivity			19(29)	24(38)	29(45)	14(22)	4.72	1	.03*
Impulsivity	17(26)	25(40)			29(45)	14(22)	6.22	1	.01*
Low Intensity Pleasure	30(46)	10(16)	22(34)	23(37)			6.08	1	.01*
Low Intensity Pleasure			22(34)	23(37)	13(20)	30(48)	3.20	1	.07
Low Intensity Pleasure	30(46)	10(16)			13(20)	30(48)	16.63	1	.00**
Perceptual Sensitivity	32(49)	13(21)	21(32)	20(32)			3.59	1	.06
Perceptual Sensitivity			21(32)	20(32)	12(19)	30(48)	4.44	1	.04*
Perceptual Sensitivity	32(49)	13(21)			12(19)	30(48)	15.73	1	.00**

\* $p < .05$ . \*\* $p < .01$ .

Note. % indicates percentage of each gender group.

Table 3

2 x 2 Follow-Up Chi-Square Analyses Comparing the Proportion of Boys and Girls Between Tertiles on the SCBE Scales Using Raw Scores

	Tertile 1 (Below the Mean)		Tertile 2 (Around the Mean)		Tertile 3 (Above the Mean)		$\chi^2$	df	p-value
	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)			
Depressive-Joyful	22(34)	19(32)	27(42)	12(20)			2.04	1	.15
Depressive-Joyful			27(42)	12(20)	15(23)	29(48)	10.21	1	.01*
Depressive-Joyful	22(34)	19(32)			15(23)	29(48)	3.31	1	.07
Aggressive-Calm	32(50)	11(18)	15(23)	22(37)			9.42	1	.00**
Aggressive-Calm			15(23)	22(37)	17(27)	27(45)	.03	1	.86
Aggressive-Calm	32(50)	11(18)			17(27)	27(45)	11.32	1	.00**
Egotistical-Prosocial	27(42)	11(18)	22(34)	21(35)			3.34	1	.07
Egotistical-Prosocial			22(34)	21(35)	15(23)	28(47)	2.32	1	.13
Egotistical-Prosocial	27(42)	11(18)			15(23)	28(47)	10.57	1	.00**

\* $p < .05$ . \*\* $p < .01$ .

Note. % indicates percentage of each gender group.

## **Appendix E: Parameter Estimates for Total Variance Accounted for by Variance Between Teacher Raters**

Because the preschool teachers rated children in six different classrooms and these classes grouped children by age, effects due to classroom and teacher were confounded. Hence, all analyses controlled for age. Two-level mixed effects models ( $CBQT_{ij} = \gamma_{00} + \gamma_{10} * C\_AGE_{ij} + u_{0j} + u_{1j} * C\_AGE_{ij} + r_{ij}$ ) were conducted with HLM 7 (Raudenbush, Bryk, & Congdon, 2004) for each of the 15 CBQ-T scales and SCBE scales specified as the criteria. The individual child ( $N=113$ ) was defined as Level 1 with intercepts and slopes for age defined as random effects ( $CBQT\ Scale = \beta_{0j} + \beta_{1j} * (C\_AGE_{ij}) + r_{ij}$ ) and classroom ( $N=6$ ) and age defined as Level 2 fixed effects ( $\beta_{0j} = \gamma_{00} + u_{0j}$ ,  $\beta_{1j} = \gamma_{10} + u_{1j}$ ). Age of the individual child was centered at the lowest value for age in the sample (40 months) to remove non-essential multicollinearity, in order to improve estimation and interpretability of fixed and random effects (Marquardt, 1980). For the fixed effects portion of the model, parameter estimates for class (Level 2), controlling for age, were small and not statistically significant, ranging from .00 to .04. A similar analysis was conducted with SCBE specified as the criterion, with non-statistically significant parameter estimates.

Table 1

## Parameter Estimates for Classroom/Age on the CBQ-T

CBQ-T Scale	Estimate		<i>t</i> -ratio ( <i>df</i> )	<i>p</i> -value
	Coefficient	SE		
Activity Level				
Intercept	3.46	.37	9.12 (5)	<.001
Classroom/Age	.04	.02	2.15 (5)	.08
Anger/Frustration				
Intercept	3.00	.28	10.7 (5)	<.001
Classroom/Age	.03	.02	1.44 (5)	.21
Approach/Positive Anticipation				
Intercept	4.28	.24	18.14 (5)	<.001
Classroom/Age	.02	.01	1.47 (5)	.20
Attentional Focusing				
Intercept	5.29	.20	27.12 (5)	<.001
Classroom/Age	-.01	.01	-.91 (5)	.41
Discomfort				
Intercept	3.98	.25	15.93 (5)	<.001
Classroom/Age	-.02	.01	-1.20 (5)	.28
Falling Reactivity/Soothability				
Intercept	4.96	.23	21.19 (5)	<.001
Classroom/Age	-.03	.02	-1.45 (5)	.21
Fear				
Intercept	4.01	.16	25.14 (5)	<.001
Classroom/Age	-.01	.01	-1.39 (5)	.22
High Intensity Pleasure				
Intercept	3.59	.32	11.07 (5)	<.001
Classroom/Age	.04	.02	2.34 (5)	.07
Impulsivity				
Intercept	3.49	.35	9.90 (5)	<.001
Classroom/Age	.03	.02	1.49 (5)	.20
Inhibitory Control				
Intercept	5.14	.21	24.23 (5)	<.001
Classroom/Age	-.02	.01	-2.07 (5)	.09
Low Intensity Pleasure				
Intercept	5.16	.21	24.90 (5)	<.001
Classroom/Age	-.02	.01	-1.78 (5)	.14
Perceptual Sensitivity				
Intercept	5.20	.06	80.12 (5)	<.001
Classroom/Age	-.01	.00	-3.17 (5)	.23
Sadness				
Intercept	4.02	.23	17.20 (5)	<.001
Classroom/Age	-.01	.01	-.49 (5)	.64
Shyness				
Intercept	3.70	.30	12.33 (5)	<.001
Classroom/Age	.00	.02	.15 (5)	.89
Smiling & Laughter				
Intercept	5.38	.28	19.31 (5)	<.001
Classroom/Age	.00	.02	.13 (5)	.91

\*\**p*<.05. \*\*\**p*<.01.

Table 2

## Parameter Estimates for Classroom/Age on the SCBE Using T-Scores

SCBE T-Score Scale	Estimate			
	Coefficient	SE	<i>t</i> -ratio ( <i>df</i> )	<i>p</i> -value
Depressive-Joyful				
Intercept	47.68	2.31	20.63 (5)	<.001
Classroom/Age	.05	.13	.42 (5)	.69
Anxious-Secure				
Intercept	49.33	1.79	27.64 (5)	<.001
Classroom/Age	.02	.10	.23 (5)	.83
Angry-Tolerant				
Intercept	49.04	1.82	27.02 (5)	<.001
Classroom/Age	-.05	.15	-.35 (5)	.74
Isolated-Integrated				
Intercept	49.17	2.88	17.07 (5)	<.001
Classroom/Age	.10	.13	.77 (5)	.48
Aggressive-Calm				
Intercept	52.15	1.44	36.14 (5)	<.001
Classroom/Age	-.14	.07	-1.92 (5)	.11
Egotistical-Prosocial				
Intercept	53.97	1.38	39.12 (5)	<.001
Classroom/Age	-.21	.07	-2.95 (5)	.03*
Oppositional-Cooperative				
Intercept	50.18	1.86	26.93 (5)	<.001
Classroom/Age	-.14	.09	-1.55 (5)	.18
Dependent-Autonomous				
Intercept	48.05	2.09	22.94 (5)	<.001
Classroom/Age	.02	.12	.16 (5)	.88
Social Competence				
Intercept	49.36	1.49	33.17 (5)	<.001
Classroom/Age	.00	.08	-.03 (5)	.98

\*\**p*<.05. \*\*\**p*<.01.



Table 3

## Parameter Estimates for Classroom/Age on the SCBE Using Raw Scores

SCBE Raw Score Scale	Estimate			
	Coefficient	SE	<i>t</i> -ratio ( <i>df</i> )	<i>p</i> -value
Depressive-Joyful				
Intercept	36.11	1.81	19.95 (5)	<.001
Classroom/Age	.03	.10	.30 (5)	.77
Anxious-Secure				
Intercept	36.70	1.48	24.72 (5)	<.001
Classroom/Age	.01	.09	.08 (5)	.94
Angry-Tolerant				
Intercept	34.51	1.53	22.54 (5)	<.001
Classroom/Age	-.12	.08	-1.45 (5)	.21
Isolated-Integrated				
Intercept	34.70	2.50	13.89 (5)	<.001
Classroom/Age	.09	.11	.83 (5)	.44
Aggressive-Calm				
Intercept	37.10	1.14	32.40 (5)	<.001
Classroom/Age	-.12	.06	-2.07 (5)	.09
Egotistical-Prosocial				
Intercept	36.28	1.20	30.27 (5)	<.001
Classroom/Age	-.18	.06	-2.86 (5)	.04*
Oppositional-Cooperative				
Intercept	38.84	1.87	20.78 (5)	<.001
Classroom/Age	-.11	.09	-1.30 (5)	.25
Dependent-Autonomous				
Intercept	34.38	1.66	20.73 (5)	<.001
Classroom/Age	.01	.09	.15 (5)	.89
Social Competence				
Intercept	123.48	5.39	22.92 (5)	<.001
Classroom/Age	-.05	.28	-.17 (5)	.87

\*\**p*<.05. \*\*\**p*<.01.

Table 4

*Means and Standard Deviations on the CBQ-T by Classroom*

Variables	Class 1 (n=28)	Class 2 (n=17)	Class 3 (n=26)	Class 4 (n=20)	Class 5 (n=34)	Class 6 (n=12)
Activity Level	4.78 (1.38)	4.01 (.92)	3.60 (1.74)	3.98 (1.11)	4.27 (1.34)	4.52 (1.09)
Anger/Frustration	3.15 (1.38)	3.81 (1.75)	3.04 (1.45)	2.59 (1.17)	3.65 (1.15)	3.48 (1.27)
Approach/Positive Anticipation	5.04 (1.01)	4.59 (.70)	4.42 (1.25)	3.82 (.82)	4.64 (.74)	4.82 (.81)
Attentional Focusing	5.11 (.93)	4.92 (1.00)	5.21 (1.08)	5.56 (.93)	5.08 (1.18)	4.97 (.92)
Discomfort	3.69 (1.42)	4.65 (1.07)	3.82 (1.20)	3.13 (1.17)	3.54 (1.08)	3.73 (1.00)
Falling Reactivity/Soothability	4.45 (1.28)	4.04 (1.32)	4.92 (1.02)	5.09 (.68)	4.34 (1.08)	4.32 (1.38)
Fear	3.33 (1.04)	--	4.25 (.77)	4.06 (1.06)	3.58 (1.02)	4.33 (1.17)
High Intensity Pleasure	4.74 (1.29)	4.33 (1.21)	3.84 (1.93)	4.23 (1.10)	4.30 (1.34)	4.30 (.83)
Impulsivity	4.28 (1.28)	3.73 (.93)	3.57 (1.59)	3.90 (.98)	4.12 (1.14)	4.24 (.90)
Inhibitory Control	4.79 (.94)	4.15 (1.33)	4.84 (1.37)	5.27 (.90)	4.92 (1.10)	4.72 (.73)
Low Intensity Pleasure	4.68 (.94)	4.63 (.64)	4.92 (.89)	5.45 (.74)	4.98 (.83)	4.82 (.59)
Perceptual Sensitivity	4.92 (1.01)	4.95 (.49)	5.12 (.95)	4.87 (.93)	5.10 (.88)	5.02 (.67)
Sadness	3.89 (1.02)	4.46 (.90)	3.86 (.86)	3.50 (1.07)	4.31 (.91)	4.01 (.97)
Shyness	3.42 (1.45)	3.73 (1.23)	3.92 (1.51)	3.44 (1.20)	3.61 (1.23)	4.25 (1.18)
Smiling & Laughter	5.71 (1.05)	5.17 (.94)	5.34 (1.27)	5.61 (1.12)	5.46 (1.02)	5.26 (.94)

*Notes.* -- indicates that data were not available for this scale for this classroom. The teacher responded “n/a” for all items related to this scale.

One participant was missing classroom data.

Table 5

*Means and Standard Deviations on the SCBE by Classroom*

Variables	Class 1 (n=28)	Class 2 (n=17)	Class 3 (n=26)	Class 4 (n=20)	Class 5 (n=34)	Class 6 (n=12)
Depressive- <u>Joyful</u>	50 (11)	46 (8)	47 (10)	52 (8)	49 (9)	48 (7)
Anxious- <u>Secure</u>	51 (8)	50 (10)	48 (9)	51 (10)	51 (8)	49 (9)
Angry- <u>Tolerant</u>	46 (6)	46 (9)	48 (9)	53 (10)	47 (7)	47 (8)
Isolated- <u>Integrated</u>	53 (9)	51 (10)	47 (10)	55 (12)	50 (9)	53 (7)
Aggressive- <u>Calm</u>	48 (5)	48 (8)	51 (9)	54 (9)	49 (7)	51 (8)
Egotistical- <u>Prosocial</u>	47 (5)	50 (8)	51 (9)	56 (8)	51 (6)	49 (8)
Oppositional- <u>Cooperative</u>	46 (7)	46 (10)	49 (10)	54 (10)	46 (6)	48 (7)
Dependent- <u>Autonomous</u>	49 (8)	46 (7)	50 (10)	49 (9)	48 (9)	48 (8)
Social Competence	49 (7)	49 (9)	49 (8)	53 (9)	49 (8)	51 (7)

*Notes.* One participant was missing classroom data.

The underlined pole indicates the pole that is associated with a higher score.

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