

ABSTRACT

Title of Document: THE ROLE OF TEMPERAMENT AND EMOTION UNDERSTANDING IN THE DEVELOPMENT OF CHILD INTERNALIZING DISORDERS

Kathleen Gifford, Doctor of Philosophy, 2014

Directed By: Professor, Hedwig Teglasi, Department of Counseling, Higher Education, and Special Education

Internalizing disorders are among the most frequently diagnosed psychological problems in childhood (Crawford, Schrock, & Woodruff-Borden, 2011). Evidence suggests that children who have the tendency to avoid, and less developed effortful control, are more likely to develop symptoms of internalizing (White, McDermott, Degnan, Henderson, & Fox, 2011). Similarly, preschoolers who are rated as being more withdrawn during social interactions often display more social anxiety than less avoidant peers (Ale, Chorney, Brice, & Morris, 2010). Furthermore, more difficulty with emotion understanding, and social avoidance, has been shown to directly relate to internalizing problems such as depression, fear/anxiety, somatic complaints, worry and rumination (Rieffe & De Rooij, 2012). Although researchers have identified some early vulnerability factors that lead to the development of internalizing problems, research on anxiety/internalizing in the preschool age population is scarce (Wichstrom, Belsky, & Berg-Nielsen, 2013). The

current study sought to fill this gap in the existing literature. The study sample consisted of 139 parent, teacher, and preschooler participants from a university setting (38 to 82 months old; with a mean age of 57 months). Temperament was examined through parent ratings on the Structured Temperament Interview (STI) (Teglasi, 2009) and the Children's Behavior Questionnaire (CBQ), Short Form (Putnam & Rothbart, 2006). Emotion understanding was examined by preschoolers' performance on the Emotion Comprehension Test (ECT) (unpublished). Internalizing behaviors were measured through teacher ratings on the Social Competence and Behavior Evaluation (SCBE) (LaFreniere & Dumas, 1996). Correlations between the STI factors and CBQ scales illustrated underlying aspects of emotionality and reactivity that influence children's approach/avoidance tendencies, and the link between temperament and overall adjustment. Children who were rated high on preferring familiar/routine activities were also rated as having more internalizing problems, and worse performance on a measure of emotion understanding; whereas, children who were rated high on sociability were rated as having fewer internalizing problems. Regression analyses demonstrated that effortful control moderated the relationship between sociability and internalizing behaviors such that children with high sociability and high effortful control displayed the best behavioral adjustment; and children with low sociability and high effortful control displayed the most internalizing behaviors.

THE ROLE OF TEMPERAMENT AND EMOTION UNDERSTANDING IN THE
DEVELOPMENT OF CHILD INTERNALIZING DISORDERS

By

Kathleen Marie Gifford

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Advisory Committee:

Professor Hedwig Teglasi, Chair

Assistant Professor Paul Gold

Associate Professor Elisa Klein, Dean's Representative

Assistant Professor Colleen O'Neal

Associate Professor William Strein

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Dedication

This dissertation is dedicated to everyone who has helped me to make it a reality. When I first started in the School Psychology doctoral program, a current student gave me a piece of advice that stuck with me. She said, “earning your doctorate is a marathon; not a sprint.” I was consistently reminded of these words over the course of the past seven years as I worked towards this end goal. I kept this advice in mind as life’s events (back surgery, buying a home, getting married, adopting dogs, and starting my first job) provided temporary distractions. I also reminded myself of this advice during times when I wasn’t sure that I would ever reach the finish line.

First, this work is dedicated to my family. I am indebted to you for helping me to want to “finish the marathon.” Your consistent words of support, guidance, love, understanding, and encouragement over the last seven years are what made it possible to want to keep persevering. You were always encouraging me to prioritize my schoolwork above everything else; and have been cheering me on each step of the way. I couldn’t have reached this goal without you.

This work is also dedicated to my husband. Your hard work and perseverance in your own doctoral work showed me the importance of never giving up. You have been wonderful and understanding as I’ve spent many weekends and weeknights locked in our office typing away. You have been supportive, encouraging, loving, and patient as I’ve dedicated much of my attention to finishing this project. I love you and look forward to enjoying more time together!

Last, this work is dedicated to “The Cohort” who supported me for seven years of paper writing, exam taking, Praxis studying, comps completion, internship applications,

and job interviews. I feel incredibly lucky to have entered the doctoral program in 2007, because I gained lifelong friends, supporters, confidants, and colleagues. You are all amazing psychologists and help to motivate me each day to better my practice as a School Psychologist.

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Chapter 1: Introduction

Introductory Narrative

Julie is four-years-old and attends a university-based preschool. Julie and her mother recently volunteered to participate in a research study regarding preschool temperament. When Julie's mother was interviewed regarding Julie's temperament, she described her as preferring to stick with known routines, rarely seeking out adventures, hesitant to try an activity for the first time, holding back when with a new group of kids her age, and needing long periods of time to warm up to people when they visit her home. As a result, Julie doesn't play with her peers as much as others in her class, and she has fewer opportunities to learn and practice social skills through social interactions. At times, she becomes emotionally upset, crying and/or withdrawing, when her mother encourages her to play with a new friend or try a new activity. Julie's temperament can be characterized as more avoidant than other children her age. Children with avoidant temperaments often have difficulty with accurate emotion understanding, and are at an increased risk of developing internalizing problems (e.g. anxiety and depression).

Statement of the Problem

Studying preschool temperament is important due to its role in child development (Kagan & Snidman, 2004) and its connection to overall adjustment (Rothbart & Bates, 1998). Temperament and experience together help to form children's cognitions about self, others, their physical and social world, their values, attitudes, and coping strategies (Rothbart, 2007). While temperament typically consists of variations in normal child development, links between temperament and adjustment problems have been well established. One particular adjustment problem linked with an early avoidant

temperament is the development of internalizing symptoms (Fox & Pine, 2012).

Although researchers have identified some early vulnerability factors that lead to the development of internalizing problems, research on anxiety/internalizing in the preschool age population is scarce (Wichstrom, Belsky, & Berg-Nielsen, 2013). The current study sought to fill this gap in the existing literature.

Internalizing problems, particularly anxiety, fearfulness, withdrawal and depression, are among the most prevalent psychiatric problems diagnosed in childhood. These internalizing behaviors have the potential to significantly impair daily child functioning and are associated with an increased risk in developing a variety of problems in adolescence and adulthood. As a result, studying vulnerability factors that lead to the development of childhood internalizing disorders is critical (Fox & Pine, 2012). Early vulnerability factors, particularly temperament profiles and child emotion understanding, have been linked to the development of internalizing in children.

The literature has identified particular temperamental traits, in combination with temperamental avoidance, as vulnerability factors for developing internalizing problems. For example, children who are rated as more anxious tend to have greater difficulty regulating their attention during stressful and/or potentially threatening situations (Fox & Pine, 2012). In addition, specific patterns of high emotional reactivity and decreased attention regulation are linked with the development of internalizing problems (Crawford, Schrock, & Woodruff-Borden, 2011). In contrast, children with more control over their attentional focusing, may face a lower risk for adverse outcomes such as anxiety and depression (Fox & Pine, 2012). The current study examined underlying aspects of reactivity and emotionality when comparing specific approach/avoidance items across

two temperament measures. Specific hypotheses were made regarding the factors/scales that would correlate based on these underlying aspects of temperament (Figure 1).

The approach/avoidance dimension of temperament has also been specifically linked to difficulty with emotion understanding. For example, children who are more behaviorally avoidant display heightened reactions to novelty, heightened sensitivity to different stimuli, and they often withdraw from unfamiliar social situations. As these behaviors are repeated over time, these children become less assertive and are often socially isolated from their peers. When children experience repeated situations in which they are socially rejected they often begin to interpret ambiguous social situations as negative and stressful (Fox & Pine, 2012).

Children develop different styles of coping with potentially stress inducing situations. For example, a behaviorally inhibited child may hold back in new situations because he/she reduces his/her stress response by observing the social environment rather than engaging with others. As children develop, they learn how to regulate their reactions to negative emotions. This regulation happens initially through the child's temperament and then over time is facilitated by effortful control (Zuddas, 2012). The current study hypothesized that effortful control acts as a resiliency factor in protecting children with avoidant temperaments from difficulty with emotion understanding, and from developing later internalizing problems (Figures 2-4).

One of the main virtues of the current study is that it adds specific information to the body of research on the development of internalizing disorders. The most recent edition of the *Handbook of Temperament* (2012) specifically recommends that additional research be conducted examining narrower constructs, narrower dimensions of

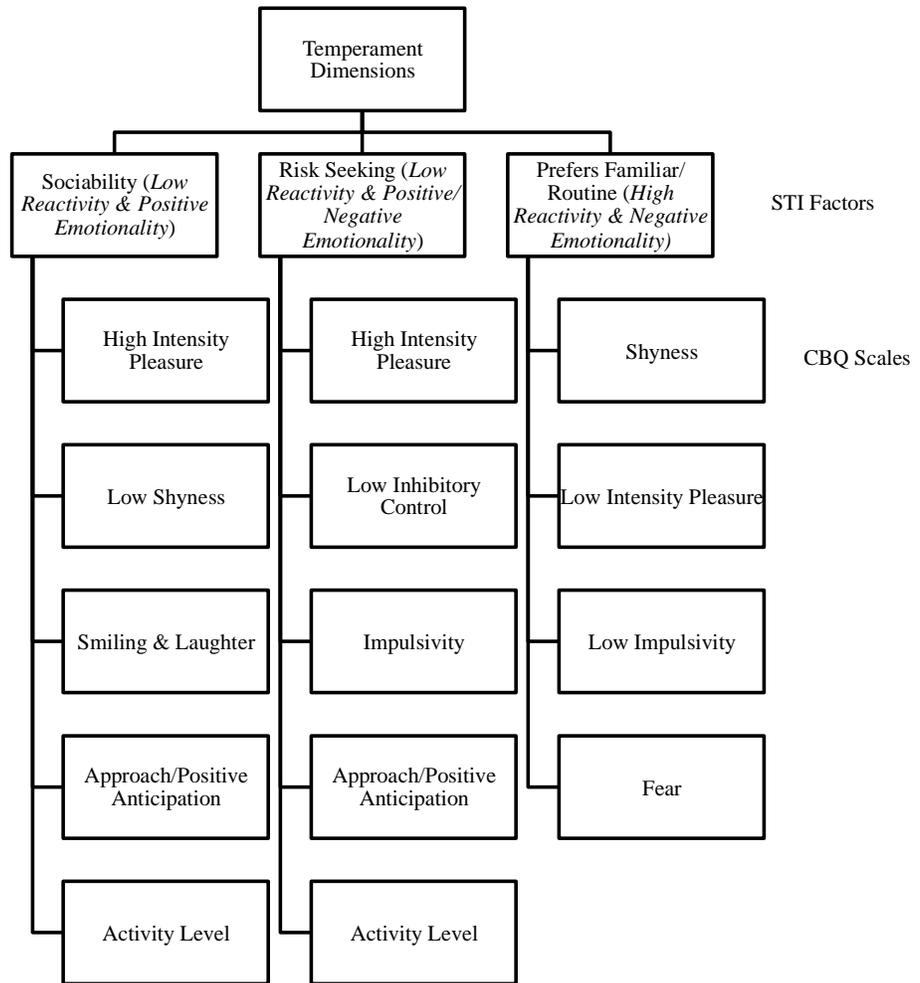
temperament, to achieve greater specificity in the connection between temperament and internalizing. This study allowed for the close examination of the approach/avoidance dimension of temperament and its connection to emotion understanding and internalizing behaviors. The information gained from the current study should be used in future studies to determine appropriate early interventions for children exhibiting temperament vulnerability factors.

Research Hypotheses

Four research hypotheses guided the current study: (1) It was hypothesized that specific approach/avoidance factors/scales on two measures of temperament, the Structured Temperament Interview (STI) (Teglasi, 2009) and the Children's Behavior Questionnaire, Short Form (CBQ) (Putnam & Rothbart, 2006), would be correlated based on underlying aspects of emotionality and reactivity; (2) It was hypothesized that non-temperament constructs related to adjustment, including emotion understanding and internalizing, would correlate with specific approach/avoidance factors on the STI; (3) It was hypothesized that children who were more avoidant, and had low levels of effortful control, would have more difficulty with emotion understanding on the Emotion Comprehension Test (ECT) (unpublished); (4) It was hypothesized that children who were more avoidant, and had low levels of effortful control, would have more internalizing behaviors on the Social Competence and Behavior Evaluation scale (SCBE) (LaFreniere & Dumas, 1996).

Theoretical Models

Developmental psychopathology is concerned with individual differences in origins, course, and outcomes of pathological development. When examining these individual differences one can understand the concepts of equifinality, in which various developmental pathways lead to the same outcome, and multifinality, in which the same vulnerability factors may have a variety of developmental outcomes (Fanti & Henrich, 2010). The current study sought to explore the concept of multifinality when examining particular temperament vulnerability factors, specifically temperamental avoidance. Particular resiliency factors (effortful control) were hypothesized to allow children to have more adaptive behavioral responses when faced with novel stimuli/situations. However, particular temperamental vulnerability factors (avoidance, negative emotionality, and high reactivity) were hypothesized to lead to the development of internalizing and emotion understanding problems. The theoretical models below illustrate the hypothesized relationships between temperament, emotion understanding, and internalizing behaviors.



Note. This theoretical model is based on conceptualizing each of the STI factors as high on that dimension of temperament. In other words, the direction of the hypothesized CBQ scale correlations are based on high ratings of Sociability, Risk Seeking, and Prefers Familiar/Routine.

Figure 1. Theoretical model of hypothesized correlational relationships between approach/avoidance, emotionality, and reactivity using Structured Temperament Interview (STI) factors and Children’s Behavior Questionnaire (CBQ) scales. Note: these are not proposed models tested in the study, but a map of conceptual relations to assist with interpreting correlations.

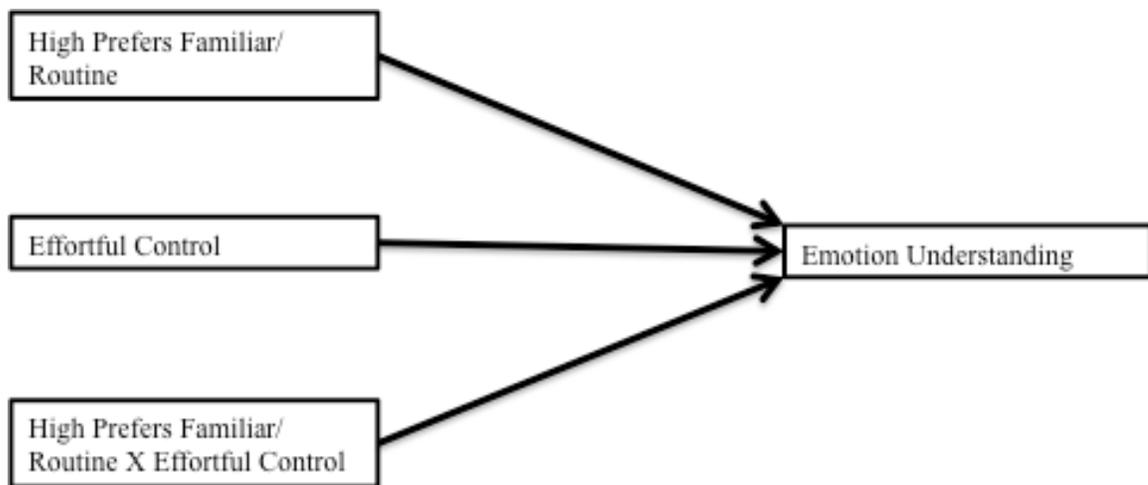


Figure 2. Theoretical model predicting Emotion Understanding from the Structured Temperament Interview (STI) factor Prefers Familiar/Routine (high), Effortful Control on the Children’s Behavior Questionnaire (CBQ), and the interaction between Prefers Familiar/Routine and Effortful Control. Effortful Control is expected to moderate the relationship between high Prefers Familiar/Routine and Emotion Understanding (ECT).

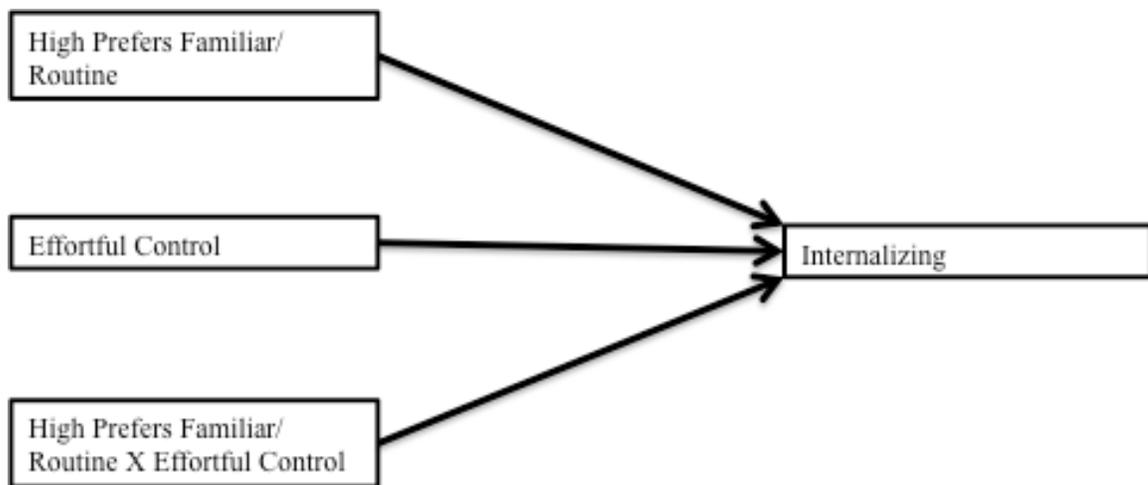


Figure 3. Theoretical model predicting Internalizing from the Structured Temperament Interview (STI) factor Prefers Familiar/Routine (high), Effortful Control on the Children’s Behavior Questionnaire (CBQ), and the interaction between high Prefers Familiar/Routine and Effortful Control. Effortful Control is expected to moderate the relationship between high Prefers Familiar/Routine and Internalizing (SCBE).

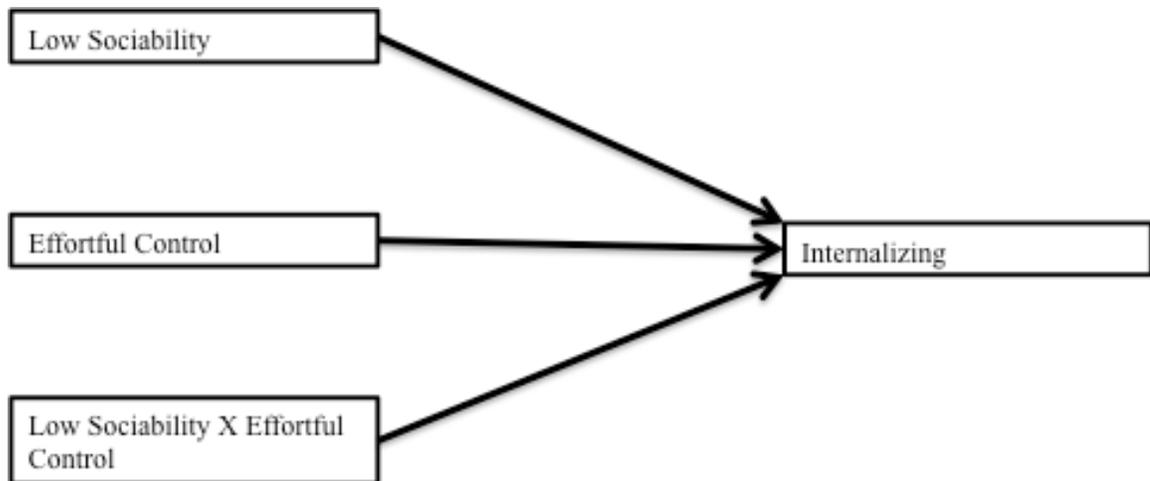


Figure 4. Theoretical model predicting Internalizing from the Structured Temperament Interview (STI) factor Sociability (low), Effortful Control on the Children’s Behavior Questionnaire (CBQ), and the interaction between low Sociability and Effortful Control. Effortful Control is expected to moderate the relationship between low Sociability and Internalizing (SCBE).

Definition of Terms

The following are three separate tables that identify key temperament, emotion understanding, and internalizing terms that are used in the literature review and throughout the current study. The tables include the term, definition, related concepts in the literature, and a behavioral example to place the term in an observable context.

Table 1

<i>Temperament Term Definitions</i>			
Key Term	Definition	Related Concepts	Behavioral Example
Approach	A general neurobiological sensitivity to positive, or reward, stimuli (present or imagined) that is accompanied by vigilance for, affective reactivity to, and behavioral predisposition towards such stimuli (Elliott & Thrash, 2010).	Positively evaluated stimuli; movement towards potential reward; associated with extraversion and positive emotionality/affectivity; behavioral activation system (BAS); greater left frontal EEG asymmetry; connected to surgency.	An approaching infant is likely to show positive affect (e.g. laughter, smiles) and will approach, or reach towards, novel toys and objects.
Attentional Control	Control over the duration of looking at/orienting towards stimuli, and reflects the amount of information processed by the child (Gartstein, Bridgett, Young, Panksepp, & Power, 2013).	Orienting; voluntary attention; precursor to effortful control; associated with executive attention; linked with self-regulation; influenced by emotionality.	Children with low attentional control, negative emotionality, and avoidance often have difficulty shifting their attention from perceived stress inducing stimuli, and experience increased negative affect.

Temperament Term Definitions

Key Term	Definition	Related Concepts	Behavioral Example
Avoidance	A general neurobiological sensitivity to negative, or punishment, stimuli (present or imagined) that is accompanied by vigilance for, affective reactivity to, and behavioral predisposition away from such stimuli (Elliott & Thrash, 2010).	Negatively evaluated stimuli; movement away from potential harm; associated with neuroticism and negative emotionality/affectivity; behavioral inhibition system (BIS); greater right frontal EEG asymmetry.	An avoidant infant is likely to show negative affect (e.g. fussing) and will avoid, or turn away from, novel toys and objects. They often show motoric reactivity (e.g. back arches, leg kicks).
Effortful Control	The efficiency of executive attention, including the ability to inhibit a dominant response and/or to activate a subdominant response (Rothbart & Bates, 2006).	Attention; duration of orienting; attentional shifting; related to self-regulation system; instrumental in directing one's attention over long periods of time; fosters regulation of approach and withdrawal tendencies; modulates emotional reactivity and behaviors; regulation of attention, behavior, and emotion; associated with less internalizing problems and better social competence.	A preschooler who has developed good effortful control may be able to redirect his/her attention from a stress inducing object/situation in order to regulate their emotional and behavioral response to be most appropriate for the situation.

Temperament Term Definitions

Key Term	Definition	Related Concepts	Behavioral Example
Emotionality (positive/negative)	Negative emotionality is a child's propensity to experience intense negative mood, irritability/frustration, fear, and high reactivity (Brumariu & Kerns, 2013). Positive emotionality is a child's propensity to experience positive moods, approach, surgency, and to be extraverted (Putnam & Stifter, 2005).	Greater negative affectivity is associated with a range of emotional/behavioral problems; negative affectivity is linked with fear and frustration; connected to anxiety. Positive emotionality is associated with positive reactivity and exuberance; associated with sociability.	Infants displaying negative emotionality often display vocal negativity (e.g. fussing, crying) and move away from novel stimuli. Infants displaying positive emotionality often display positive affect and activity in response to novel stimuli.
Inhibitory Control	Capacity to suppress inappropriate actions or responses; includes planning capabilities (Fernandez-Vilar & Carranza, 2013).	Specific component of effortful control; related to internalizing in preschoolers.	A child with low inhibitory control is more likely to experience fear and frustration to novel and/or non-threatening stimuli/situations.
Reactivity	Individual differences in physiological and behavioral responses to the environment that are considered biologically based (Hane, Fox, Henderson, & Marshall, 2008).	Motor arousal; orienting; emotionality; underlying motivational systems such as approach-withdrawal behavioral tendencies.	Negatively reactive infants display increased motor arousal (leg kicks, arm waves, back arches) and emotionality (cries) during unfamiliar events.

Temperament Term Definitions

Key Term	Definition	Related Concepts	Behavioral Example
Self-Regulation	The ability to regulate behavior, emotion, and cognition. Enables a child to control goal directed activities over time and contexts (Zhou, Chen, & Main, 2012).	Linked to effortful control and executive function; associated with working memory, executive attention, and inhibition.	A child with well-developed self-regulation would be able to pause and ask for adult assistance if a peer took away the toy he/she was playing with. This would be done in the absence of an emotional reaction to losing the toy.
Sociability	Seeking and taking pleasure in interactions with others (Rothbart & Bates, 2006).	Related to the system of social reinforcement and favoring socialization; low-intensity pleasure; perceptual sensitivity; affiliation.	Children who are rated high in sociability willingly approach new peers with positive affect.

Table 2

Emotion Understanding Term Definitions

Key Term	Definition	Related Concepts	Behavioral Example
Emotion Identification / Awareness	A child's ability to reflect upon, and identify, their own/others emotions given a particular context (Rieffe & De Rooij, 2012).	Impairments are associated with increased rates of internalizing problems; emotions occur during the bodily detection of arousal; involves an attentional process to an external event; related to how emotions are valued.	A child having difficulty with emotion awareness likely has trouble analyzing the emotion evoking event and identifying different aspects of the situation that would call for different emotions.
Emotion Understanding	The ability to recognize and label one's own and others emotions, the ability to tie those emotions to particular situations, and the ability to understand the causes of those emotions (Blankson, O'Brien, Leerkes, Marcovitch, Calkins, & Weaver, 2013).	Contributes to child social competence; supports the development of theory of mind; related to children's ability to cope with negative emotions; connected to children's ability to self-regulate.	Preschoolers who are better at identifying their own/others emotions, and predicting emotions based on the social context, behave more prosocially with their peers.

Emotion Understanding Term Definitions

Key Term	Definition	Related Concepts	Behavioral Example
Social Competence	Understanding and complying with culturally derived conventions and customs (Moran, Lengua, & Zalewski, 2013). Engaging in effective social interactions (Rose-Krasnor, 1997).	Effective regulation of emotions; sensitivity and empathy towards peers; engaging in complex play; forming friendships with peers; demonstrating the ability to solve social problems.	Socially competent children are effective in social interactions; and display effective problem solving, emotion regulation, and communication skills.

Table 3

Internalizing Term Definitions

Key Term	Definition	Related Concepts	Behavioral Example
Anxiety (pediatric)	One of the most common disorders diagnosed in childhood; significantly impairs current functioning; increased risk for developing problems in adolescence and adulthood (Fox & Pine, 2012).	Early risk factors: temperamental behavioral inhibition, reacting to novel situations with withdrawal or wariness; conceptually related to fearful, reactive temperaments, and approach/withdrawal; often co-occurs with depression.	Children with pediatric anxiety often display early behavioral inhibition, heightened reactions to novelty, withdrawal/avoidance, and are less assertive with their peers. This can lead to negative self-perceptions and social rejection.
Behavioral Inhibition	A temperament style involving the tendency to show signs of fear, reticence, or wariness in response to unfamiliar situations and to withdraw from unfamiliar peers (Chronis-Tuscano, Degnan, Pine, Perez-Edgar, Henderson, Diaz, Raggi, & Fox, 2009).	Increased wariness; greater autonomic reactivity; elevated morning cortisol levels; heightened startle responses; more vigilant attention styles; heightened amygdala activation to novel neutral faces and threatening emotional faces.	A behaviorally inhibited child is likely to observe new peers playing at the playground, rather than joining immediately. This child takes lengthy periods of time to warm up to new people.

Internalizing Term Definitions

Key Term	Definition	Related Concepts	Behavioral Concept
Depression (pediatric)	One of the most frequent psychiatric disorders diagnosed in childhood. It affects behavioral, emotional, and academic development (Fruhe, Allgaier, Pietsch, Baethmann, Peters, Kellnar, Heep, Burdach, von Schweinitz, & Schulte-Korne, 2012).	Linked with lower social skills; more interpersonal conflicts; linked with early school dropout; if untreated can lead to symptom progression, co-morbidity, and recurrence; co-occurs with anxiety.	Children with pediatric depression can also experience negative self-perceptions, decreased social interaction, and display a lack of interest in activities.
Internalizing	Internalizing problems include anxiety, less adaptive emotion regulation, and maladaptive behavioral inhibition (Moran, Lengua, & Zalewski, 2013).	Linked with interactions between greater negative emotionality (i.e. fear), less effortful control, low attentional control, and low impulsivity; connected to pediatric depression and anxiety.	A child struggling with internalizing behaviors is likely to be more fearful, avoidant and inhibited than his/her peers.

Study Limitations

The current study had particular limitations that the researcher was aware of prior to conducting the proposed analyses. The study sample was relatively homogenous in socioeconomic status because data was collected from a university based preschool setting. The parent participants in the current study were highly educated individuals who were part of middle-class families, which will present some limitations in

generalizability. In addition, there were no formal measures of child or parent psychopathology included in the current data set.

Introduction to the Literature Review

The next chapter provides a literature base to support the current study. The first section of Chapter 2 includes brief definitions of temperament in general. Then, the remainder of the chapter is organized by the four study hypotheses. Specifically, the approach/avoidance dimension of temperament is defined, along with related temperament constructs including emotionality and reactivity. Then, the construct of effortful control is described as a resiliency factor, and the related constructs of attention, self-regulation, and inhibitory control are explained. Next, the relationship between approach/avoidance, effortful control, and emotion understanding is illustrated. Last, the relationship between approach/avoidance, effortful control, and internalizing is described. The four study hypotheses are cited in the relevant sections of the literature review.

Chapter 2: Overview of the Literature

Defining Temperament

Temperament is thought of as a biologically based set of traits seen early in a child's development. These traits show stability over time and consistency across situations, although they are subject to subtle changes throughout a child's development (Rothbart, 2012). Child temperament is believed to consist of: individual differences in normal behaviors related to affect, activity, attention, and sensory sensitivity; it is typically expressed through response intensities, latencies, durations, thresholds, and recovery times; it appears in the first few years of life; dimensions have a biological base; and it is relatively stable and predictive of developmental outcomes (Mervielde & De Pauw, 2012). A historical sketch of definitions of temperament can be found in Appendix A (Strelau, 1998).

Researchers tend to have unique ideas about the different dimensions of temperament and how they are expressed early on. For example, some researchers emphasize the emotionality aspects of temperament, where others focus more on the biological differences between child temperaments. Regardless of researcher orientation, the behaviors observed are a product of temperament interacting with the environment and therefore it is important to examine context when studying temperament. One temperament dimension that is readily examined, and is the focus of this particular study, is approach/avoidance (Bjornebekk & Diseth, 2010; Elliott & Thrash, 2002; Elliott & Thrash, 2010; Hane, et al., 2008; Helfinstein, Fox, & Pine, 2012; Putnam & Stifter, 2005; Stansbury & Harris, 2000).

Approach and Avoidance

Temperamental approach is believed to consist of the tendency to move towards or orient towards novelty and is associated with thriving. It facilitates socialization and involvement in new activities/situations. Temperamental avoidance is believed to consist of the tendency to move away from novelty and/or perceived threats. It serves a biological purpose in helping humans survive and avoid potential harm (Elliott, 2008). The approach/avoidance temperament dimension has inherent value in that avoidance protects individuals from harmful stimuli, and approach to positive stimuli can be rewarding.

The approach/avoidance dimension of temperament has been represented in the literature as either being opposite ends of a continuum or as distinct dimensions. The conceptualization of approach/avoidance as distinct or polar ends influences how child temperament is perceived. The temperament measures used in the current study included the Structured Temperament Interview (STI) (Teglasi, 2009) and the Children's Behavior Questionnaire, Short Form (CBQ) (Putnam & Rothbart, 2006). The STI examines particular situations, reactions to people, and reactions to stimuli, and whether they are approached or avoided, in other words this dimension of temperament as assessed by the STI is believed to be opposites on a continuum. The CBQ examines approach and avoidance through levels of reactivity and emotional response; and also demonstrates levels of approach/avoidance on a continuum.

Approach/avoidance temperament characteristics can be seen in young infants by subtle behavioral manifestations. For example, the newborn child shows distress and avoidant movements when unhappy. Infants as young as two months old demonstrate

temperamental approach when they smile, laugh, and move their body towards stimuli. Behavioral inhibition, or social avoidance, is more readily noticed when the infant is about seven months old (Rothbart, 2007). Studies have shown that infants rated high in approach (or low in avoidance) were also rated as more rhythmic, cooperative, and manageable and less irritable than infants rated low in approach (Henderson & Fox, 1998).

Approaching children are typically attracted by novelty, and they do not hold back when presented with new people, new places, or new things. These children are often sociable and outgoing and like to be hands-on learners. Teachers' ratings of approaching children were also highly correlated with ratings of adaptability and positive mood. Based on Thomas & Chess's (1977) dimensions of temperament, children who easily approach novel and unfamiliar situations and/or people are perceived more positively (Henderson & Fox, 1998). The STI uses examples of such novel situations to assess the degree of approach for that child in that particular situation. The CBQ provides ratings for high and low intensity activities to gauge children's levels of reactivity and approach/avoidance.

Avoidant children need time to warm up to new situations and stimuli. These children are often hesitant with new people, new places, or new things. Children who withdraw often prefer the familiar or routine, are cautious, and will avoid risky situations. These children prefer to observe rather than do, and learn by watching others (Kristal, 2005). Items on the STI assess this dimension of temperament by asking parents questions about unfamiliar versus routine situations as well as safe versus risky situations. The CBQ assesses this dimension by including questions related to shyness

and low intensity interests. Specific information about approach/avoidance studies examined can be viewed in Appendix F.

The current study conceptualized the avoidance end of the approach/avoidance dimension continuum as a temperament vulnerability factor. Temperamental avoidance has been linked to the development of later adjustment problems including anxiety and depression (Fox & Pine, 2012). The next section considers other temperament vulnerability factors that have the potential to interact with avoidance to influence overall adjustment.

Temperament Vulnerability Factors

Temperament is a key factor that contributes to children's vulnerable or resilient responses in the face of adversity or risk. In addition, temperamental differences in sensitivity, reactivity, and emotionality to perceived threat play a large role in resilient or maladaptive outcomes. These developmental vulnerability factors are biologically based influences that contribute to children's overall cognitive and social-emotional functioning (Lengua & Wachs, 2012). Temperament vulnerability factors examined in the current study included avoidance, negative emotionality, and high reactivity.

Emotionality can be divided into positive and negative aspects of affective experiences. It encompasses concepts such as behavioral inhibition, surgency, and fear (Olino, Klein, Dyson, Rose, & Durbin, 2010). Reactivity involves the manner in which children respond to sensory stimulation, including the latency of the response and how children are able to modulate their response to such stimuli. It includes the intensity of responding and the concept of exuberance (Fox & Polak, 2004).

Influence of emotionality. Researchers growing recognition of distinctions between primary emotions has led to the development of scales measuring the discrete aspects of emotionality, rather than the broad concept of overall mood (Putnam, Rothbart, & Gartstein, 2008). Temperament research has often focused on the broad constructs of positive and negative emotionality. Positive emotionality is associated with positive mood states, sociability, and engagement with the environment/approach; negative emotionality is related to negative mood states, and low engagement with the environment/avoidance (Laptook, Klein, Olino, Dyson, & Carlson, 2010).

According to Teglasi (2006), the tendency to approach or avoid certain situations is often correlated with positive and negative emotions evoked in those particular situations. For example, the negative emotion of fear may influence a child's tendency to approach a new person or stimulus. Gartstein, Putnam, and Rothbart (2012) found that negative emotionality is associated with both internalizing and externalizing problems in later childhood.

Surgency. The temperament dimension of surgency is characterized by positive affect (smiling, laughter, activity, high-intensity stimulation) and approaching tendencies. It is typically used as an interchangeable term with positive emotionality and extraversion, and is associated with enthusiasm, activity, approach tendencies, and sociability. Children with higher levels of positive affect tend to be more engaged with their environment and therefore display more approaching behaviors (Gartstein, Putnam, & Rothbart, 2012).

Negative emotionality. The temperamental trait of negative emotionality is one of the most early appearing, and is often measured in infancy. Negative affectivity in

infancy can be used to successfully predict distress during the preschool ages. The consistent experience of early negative emotionality has been linked to both externalizing and internalizing disorders. Children who experience excessive levels of fear and sadness often develop internalizing problems; and those that experience elevated levels of anger and frustration often develop externalizing problems (Gartstein, Putnam, & Rothbart, 2012).

Influence of reactivity. The influence of overall arousal of children in particular contexts has led researchers to measure situational contexts that are characterized by a continuum of low to high intensity, as experienced by the individual child (Putnam, Rothbart, & Gartstein, 2008). Children who are highly negatively reactive tend to cautiously approach new situations and/or may fear and avoid such situations. However, those low in negative reactivity might seek out novelty and/or risk in order to attain that particular emotional state. The style of approaching or avoiding stimuli, people, and situations in a planned (proactive) or provoked (reactive) manner also influences adjustment (Henderson & Fox, 1998).

Children who are able to regulate reactivity to novelty develop resilience, which allows for positive social skills to develop and decreases inhibited/anxious behaviors over time (Degnan & Fox, 2007). While the child's internal temperament contributes to behavioral reactivity and inhibitory control, external sources such as parenting and the caregiving context can influence the stability of behavioral inhibition. Children may develop adaptive attention and self-regulatory skills, supported by parenting practices, which contributes to a resilience process.

Exuberance. Temperamental exuberance is characterized by positive reactivity to novelty, approach behaviors, and sociability. Exuberant children are also often impulsive, sensitive to potential rewards, fearless, and engage in risk taking behaviors. Risk taking behaviors involve a tendency to approach that may cause harm to the child, but is also an opportunity to obtain a potential reward (Lahat, Degnan, White, McDermott, Henderson, Lejuez, & Fox, 2012).

Children with exuberant temperaments can experience both adaptive and maladaptive outcomes. For example, children who are more likely to approach display positive affect when goals are not being blocked. However, if goals are blocked, these children can display frustration and aggression towards the blocking stimulus. Some of the adaptive outcomes of exuberance include greater social competence and less social reticence. The child's ability to shift attention appears to moderate the exuberance and the tendency to engage in risk taking behaviors (Lahat et al., 2012).

Negative reactivity. Negatively reactive infants demonstrated fearfulness to novel/unfamiliar events in research conducted at 9 and 14 months of age, and behavioral inhibition at 21 months of age (Kagan & Snidman, 1991). Furthermore, negatively reactive infants selected at 4 months old were significantly more avoidant at 9 months old when exposed to fear-evoking stimuli (Hane et al., 2008). Negative reactivity is thus conceptualized as a vulnerability factor in the current study, and has the potential to lead to later adjustment problems.

Temperament Resiliency Factors

Temperament characteristics related to self-regulation, including flexibility, persistence, and effortful control, have been used to differentiate children as either

resilient or vulnerable. Study findings have indicated that when higher levels of effortful control interact with risk, it serves as a protective, or resiliency factor. Furthermore, the pattern of study findings indicates that easy-difficult temperaments (or low-high reactivity), negative emotionality, and effortful control emerge as significant moderators of children's response to risk (Lengua & Wachs, 2012). The current study investigated the moderating role of effortful control, as a resiliency factor, on the relationship between an avoidant temperament, emotion understanding, and internalizing problems. Components of effortful control including attention, self-regulation, and inhibitory control are described below.

Influence of effortful control. The concept of effortful control involves aspects of attention and behavioral regulation. Effortful control reflects the child's ability to use executive control processes to control his/her levels of reactivity and replace his/her tendencies with more appropriate or socialized methods of responding to threat. Effortful control allows for the inhibition of a dominant response to perform a non-dominant response. It can allow for attentional control in times of threat, novelty, or challenge. In situations of threat, effortful control moderates the negative affectivity experienced and internalizing and/or fear. Children who are high in effortful control tend to develop skills in overriding their negative affectivity and therefore more adaptively respond in particular situations. Therefore, effortful control can be considered a resilience factor in preventing the development of anxiety (Lonigan & Vasey, 2009). Low levels of effortful control have also been highly correlated with later externalizing behavior problems (Gartstein, Putnam, & Rothbart, 2012).

Development of effortful control. Early in life, caregivers are largely responsible for controlling an infant's behavior. For example, soothing an infant and calling his/her attention away from a negative/distressing stimulus is common practice to facilitate control over negative reactions. As the infant matures, he/she is better able to regulate his/her behavioral and emotional reactions to stimuli, and the locus of control becomes more internalized. Preschool has been identified as a period of considerable development of effortful control. At this stage of development children are better able to deal with both negative and positive reactivity (Rueda, 2012).

Link to pathology. Avoidance, due to anxiety or fear, reflects a passive form of behavioral effortful control. Whereas, impulsive approach is typically due to a lack of voluntary behavioral effortful control. These forms of over or undercontrolled behaviors have the potential to lead to pathological behaviors. Children who experience internalizing problems are often rated as low in effortful control, and high on fear and shyness (Rueda, 2012).

Scales from the CBQ that load into the effortful control factor include Inhibitory Control, Attentional Focusing, Low-Intensity Pleasure, Perceptual Sensitivity, and Smiling and Laughter (Rueda, 2012). The current study used a composite of the Inhibitory Control and Attentional Focusing scales to represent Effortful Control. The Effortful Control composite created from the CBQ was used to predict emotion understanding and internalizing (Research Hypotheses 3 and 4). While many physiological studies exist examining the role of effortful control on emotions and behaviors, the current study used parent behavioral observations on the CBQ as the indicator of effortful control.

Influence of self-regulation. Self-regulation includes aspects of voluntary attention, inhibitory control, and self-soothing. It is related to concepts such as effortful-control and inhibiting a dominant response in favor of a more socially acceptable response (Gartstein, Slobodskaya, Putnam, & Kinsht, 2009). Self-regulation is a dimension of temperament that is closely related to the tendency to approach or avoid and the development of social competence. During the preschool years, the development of self-regulation becomes one of the more important child capacities. Self-regulation during times of frustration, challenge, and compliance with caregiver demands becomes a defining feature of adaptive child behavior. Children learn how to self-regulate when they are able to modulate their reactivity to meet the goals and/or demands of the situation. The most fundamental aspects of reactivity include approach and avoidance during novel, unfamiliar, or challenging situations. The approach aspect of reactivity includes being sensitive to rewards, emotional exuberance, and excited anticipation for enjoyable activities. The approaching child demonstrates this quality with behavioral approach to novelty and challenge. The avoidance aspect of reactivity reflects sensitivity to potential threat, fear, and shyness. The avoidant child demonstrates this quality with behavioral withdrawal and inhibition in response to novelty and challenge (Dennis, 2006).

Children develop the potential to self-regulate their reactivity in novel situations and demonstrate behavioral manifestations of either approach or avoidance in those situations. Preschool age children are at an age of rapid development in self-regulation and also rely on external sources of support to regulate their behaviors (Dennis, 2006).

Influence of attention. Attentional control relates to the child's ability to shift attention from negative thoughts or threatening stimuli to focus on more positive/adaptive stimuli (White et al., 2011). Attention is directly related to approaching and avoiding tendencies because selective attention is a form of approach/avoidance and neurobiological systems such as the Behavioral Inhibition System (BIS)/Behavioral Approach System (BAS) are associated with attention. Children, who are highly reactive, and highly attentive to potential threat, have a higher likelihood of developing later anxiety. The most commonly studied mechanism for anxiety is attentional bias. Furthermore, attentional processing is closely linked to high reactivity. Vervoort, Wolters, Hogendoorn, Prins, De Haan, Boer, and Hartman (2011), acknowledged a mediating relationship between threat-related attentional processing and the link between temperament and anxiety. Models have demonstrated that high levels of reactive temperament are associated with increased risk of developing anxiety. This risk of developing anxiety is at least partially mediated by attentional bias towards threat related information. More regulated individuals tend to be better able to regulate the attention bias towards threat thus protecting the individual from developing anxiety (Vervoort, et al., 2011).

Children who have heightened levels of negative affectivity also often have higher levels of sensitivity or attention directed towards threatening stimuli. Links have been shown between the BIS and attentional bias towards threat. Attention selectivity influences later emotion and cognitive processing and therefore influences children's perceptions of others and the world around them. Some researchers have demonstrated the link between increased vigilance, or heightened attentional control, towards threat and

later development of anxiety. Although at an increased risk for development of anxiety, not all children who are high on negative affectivity develop later anxiety or psychopathology (Lonigan & Vasey, 2009).

Attentional control is also essential for social-emotional competence and academic competence. Classroom tasks often require children to maintain attention during repetitive/less engaging tasks. As a result, children with attention difficulties often have math, reading, and language deficits. Children with more developed attention skills are more likely to attend to instruction and have better overall academic success (Rhoades, Warren, Domitrovich, & Greenberg, 2011).

Non-Temperament Constructs Related to Adjustment

The previous sections have documented the link between approach/avoidance, reactivity, emotionality, and effortful control in predicting overall adjustment. In addition to temperament dimensions, the current study investigated the link between temperament vulnerability factors, emotion understanding, and internalizing problems. It was hypothesized that effortful control acts as a resiliency factor in moderating the relationship between approach/avoidance, emotion understanding, and internalizing (Research Hypotheses 3 & 4).

Emotion understanding. Temperament dimensions such as attentional control, emotionality, self-regulation, effortful control, approach, avoidance, and reactivity facilitate the interpretations children make about their own and others emotions. The ability to understand and regulate emotions is an important milestone in children's social and cognitive development. Children's initial tendency to react is a function of temperament and over time becomes a result of effortful control. Children who develop

appropriate emotion understanding become more efficient and effective in contexts that elicit emotions (Zuddas, 2012). In order for children to experience successful daily social interactions, they learn to exhibit a certain level of emotional control. Early on, children are taught how to balance between their own desires, and societal goals, in order to achieve successful social interactions (Rieffe & De Rooij, 2012).

Development of social skills throughout the preschool years prepares children for successful peer relationships. Children often learn about social cues and subtleties through facial expressions and body language. Infants begin life by examining the facial features of their primary caregivers in order to learn about their environment. Studies have demonstrated that children who are more accurate in identifying peers' facial emotions are more likely to have a prosocial response to those emotions.

Insight into one's own emotions is believed to be a prerequisite to developing effective emotion regulation. The capacity to have such insight is often called emotion awareness. Impairments in emotion awareness have been associated with later development of internalizing problems such as depression and anxiety (Rieffe & De Rooij, 2012).

Connecting emotion understanding and temperament. Children with avoidant temperaments typically display early sensitivity to novel situations, heightened reactions to novelty, and often withdraw from novelty. This behavioral withdrawal often takes place within the child's social context with peers. As children repeatedly withdraw from unfamiliar social situations, they become more likely to be rejected by their peers. This rejection can lead to negative self-perceptions and interpreting ambiguous social situations as stressful. The repetition of interpreting social situations as negative,

followed by social rejection, can lead to the development of internalizing problems (Fox & Pine, 2012).

Connecting emotion understanding and social competence. Children benefit from opportunities to practice their skills in social situations, and preschool often provides the first non-family experience for social-emotional skill development. Aspects of social competence that emerge during the preschool years are self-awareness and an increase in the ability to understand others in the environment. An increase in perspective taking also typically emerges during this developmental period. Examining children's social competence during the preschool ages allows for observation of individual differences and normative growth (Santos, Peceguina, Daniel, Shin, & Vaughn, 2013).

When children struggle to make social connections, they get fewer opportunities to practice their social-emotional skills. Children experiencing low social-emotional competence may have difficulty connecting with peers and teachers, develop internalizing behavior problems (i.e. depression and anxiety), and/or use physical methods to express their needs (Gunter, Caldarella, Korth, & Young, 2012). Children who lack social competence are at increased risk of reduced socialization opportunities, peer rejection, withdrawal, behavioral problems, and low achievement. This often leads to problems transitioning to kindergarten, being less academically prepared, and exhibiting more behavioral problems than peers (McCabe & Altamura, 2011).

Preschoolers' ability to accurately understand emotions was examined through the Emotion Comprehension Test (ECT) in the current study. Based on the literature review, it was hypothesized that children with an avoidant temperament, and less developed

effortful control, would have more difficulty with emotion understanding (Research Hypothesis 3). Development of emotion understanding leads to successful social interactions and social competence. However, difficulty with emotion understanding, and low levels of effortful control, can lead to behavioral problems such as the development of internalizing behaviors.

Internalizing. Children with less developed emotion understanding often develop behavioral/psychological problems. The development of early behavioral problems is often due in part to the inability to regulate and express emotions. In addition, children who exhibit more difficult temperamental traits during preschool often have more adjustment difficulties later on. For example, high levels of negative emotionality, and avoidance, are often linked to the development of internalizing in preschool aged children (Engle & McElwain, 2011).

Internalizing disorders are among the most frequently diagnosed behavioral/psychological disorders in childhood. Specific patterns of temperamental traits and emotion understanding have been linked to the development of internalizing over time. For example, children with high emotional reactivity, decreased attention regulation, and increased avoidance are more prone to experiencing symptoms of internalizing disorders. In addition, specific patterns of difficult child temperamental traits have been found to be one of the most robust predictors of internalizing (Crawford, Schrock, & Woodruff-Borden, 2011).

Temperament and internalizing. Examining the connection between temperament traits and internalizing problems has several important implications including targeting temperamental traits that may serve as precursor phenotypes to

developing internalizing disorders; it may allow for identification of more homogenous subgroups of internalizing disorders with different developmental trajectories; studying the pathways between temperament and internalizing may clarify the early processes involved in the development of psychopathology; it may be helpful in planning treatment and predicting treatment outcomes; it may help to provide early identification of those at risk of developing internalizing problems; and temperament could help to explain comorbidity of psychiatric conditions (Klein, Dyson, Kujawa, & Kotov, 2012).

Temperament and depression. The temperament trait of negative emotionality is the most commonly linked to the development of depressive symptoms later on in life. For example, low positive emotionality assessed at age 3 has been associated with depressive cognitive biases at age 7, and parent-reported depression at age 10 (Dougherty, Klein, Durbin, Hayden, & Olino, 2010). In addition, an observational study of child temperament has linked social reticence, behavioral inhibition, and high reactivity at age 3 with elevated rates of depression at age 21 (Caspi, Moffitt, Newman, & Silva, 1996).

Temperament and anxiety. Negative emotionality is also highly associated with the development of anxiety disorders. In addition, children who are behaviorally inhibited are more likely to develop anxiety disorders than children with other temperament profiles (Fox & Pine, 2012). Particular resiliency factors can aid in preventing later adjustment problems. For example, children with high negative emotionality, but well developed effortful control, may be able to function better when dealing with life stressors that could lead to anxiety (Klein et al., 2012).

Behavioral inhibition. Behavioral inhibition has been linked with increased social reticence during preschool and an increased risk of developing internalizing problems, specifically anxiety, in adolescence. Evidence suggests that children who have the initial tendency to avoid, but have better developed effortful control, may experience better emotional adjustment in anxiety-provoking situations, and are less likely to develop symptoms of internalizing (White et al., 2011). Behavioral inhibition is most closely associated with the development of social phobia (Klein et al., 2012).

Behavioral inhibition is generally defined as a child's initial behavioral reactions of fearfulness, wariness, and low approach to unfamiliar people, objects, and contexts (Dyson, Klein, Olino, Dougherty, & Durbin, 2011). It has also been defined as one's initial negative emotional and motor reactivity to novelty (Putnam & Stifter, 2005). Behavioral inhibition can be observed as early as infancy and often characterizes as much as 15% of children (Dyson, et al., 2011).

More recent research has attempted to examine both behaviors and affect when determining whether a child is truly inhibited. For example, when a child avoids a situation, and has negative affect when doing so, he/she would be demonstrating the inhibition system. However, avoidance without the presence of negative affect may indicate disinterest or low approach tendencies. Similarly, when a child approaches a stimulus with positive affect he/she may be highly motivated to approach and would demonstrate low levels of inhibition (Putnam & Stifter, 2005).

When examined in toddlers, behavioral inhibition also includes vigilance and being withdrawn in the presence of novel people and situations (Degnan & Fox, 2007). Kagan and Snidman (1991) exposed 4-month-old infants to visual and auditory stimuli

and found that infants high in motor activity and negative affect were more likely to be highly inhibited when they were 4-years-old (Putnam & Stifter, 2005). Behavioral inhibition has typically been measured by presenting a child with a novel object (e.g. clown, robot, etc.) and observing overt approach or avoidance. However, more recently researchers have questioned the inference that a child who does not approach a novel object/person is inhibited. Researchers are now considering whether the child who does not approach is truly inhibited or rather simply not interested in exploring (Putnam & Stifter, 2005).

Behavioral inhibition and anxiety disorders. Children with temperaments characterized by behavioral inhibition are significantly more likely to develop anxiety disorders than children who are less inhibited. From birth, children with behavioral inhibition tend to have heightened reactions to novelty and are more sensitive to changes in stimuli. Once these children reach toddlerhood, they are more likely to withdraw during novel social situations, which can lead to social isolation after repeated experiences in which the toddler withdraws from his/her peers. If this pattern of behavior continues into adolescence, behavioral inhibition can lead to social anxiety (Fox & Pine, 2012).

Behavioral inhibition stability. Current research has shown that behavioral inhibition is only moderately stable over time. Stability estimates have ranged from .24 to .64; resulting in fewer children labeled as behaviorally inhibited as a toddler also displaying this inhibition in adulthood (Dyson et al., 2011). For example, a child's tendency to attend to a potential threat influences whether temperament characterized by behavioral inhibition will lead to later adolescent/adult anxiety. Anxious adults often

attend more acutely to potential threats and have difficulty disengaging from the potential threat once it is noticed (Fox & Pine, 2012).

Study Purpose

The overall aim of this study was to examine the relationship of the approach/avoidance dimension of temperament with related temperament constructs (emotionality, reactivity, and effortful control), and with emotion understanding and internalizing problems. The first research purpose was to examine the approach/avoidance dimension of temperament and related temperament constructs by correlating two measures of temperament: the STI (Teglasi, 2009), and the CBQ, Short Form (Putnam & Rothbart, 2006). More specifically, underlying aspects of emotionality and reactivity on both measures of temperament were identified. The second research purpose was to examine non-temperament correlates of the approach/avoidance dimension of temperament that are related to adjustment. More specifically, the relationship between approach/avoidance, emotion understanding, and internalizing was examined. The third research purpose was to examine the interaction between the approach/avoidance temperament dimension and effortful control in predicting a child's ability to understand others' emotions. The fourth, and final, research purpose was to examine the interaction between the approach/avoidance temperament dimension and effortful control in predicting adjustment difficulties, specifically internalizing problems. A more detailed description of the research purposes and hypotheses is stated below:

1. The first research purpose was to examine the approach/avoidance dimension of temperament and related temperament constructs by correlating two measures of temperament: the STI (Teglasi, 2009), and the CBQ, Short Form (Putnam &

Rothbart, 2006). A principal components analysis, previously conducted, produced three approach/avoidance factors from the STI: Prefers Familiar/Routine, Sociability, and Risk Seeking (Appendix B). Temperament dimensions that are conceptualized as correlates of the approach/avoidance dimension, specifically the dimensions of reactivity and emotionality, were examined. Each of the three factors on the STI (Prefers Familiar/Routine, Sociability, and Risk Seeking) was correlated with specific scales on the CBQ that are subsumed by the broader reactivity and emotionality dimensions of temperament. These correlations highlight the underlying reactivity and emotionality processes linked to approach/avoidance tendencies. The hypotheses were organized by the three STI factors.

- a. The *Prefers Familiar/Routine* factor on the STI, based on the literature review, is linked with high reactivity and negative emotionality. For example, behavioral inhibition, or low behavioral approach, is associated with initial negative emotional and motor reactivity to novelty (Putnam & Stifter, 2005). Furthermore, children who are highly negatively reactive tend to cautiously approach new situations and/or may fear and avoid such situations (Teglasi, 2006). Based on the literature, the Prefers Familiar/Routine factor on the STI was hypothesized to correlate with four of the CBQ scales: 1. Positively with the Low Intensity Pleasure scale on the CBQ, because this scale measures the degree of pleasure or enjoyment felt in relation to low stimulus intensity and low novelty; 2. Positively with the Fear scale on the CBQ, because this scale measures the amount of

negative affect, unease, worry, or nervousness that is felt in anticipating potentially threatening situations; 3. Positively with the Shyness scale on the CBQ, because this scale assesses the degree of slow or inhibited approach in social situations involving novelty or uncertainty; and 4. Negatively with the Impulsivity scale on the CBQ, because this scale measures the degree of quick approach of novel situations, being the first to try new activities, and rushing into new activities without thinking about them ahead of time.

- b. The *Sociability* factor on the STI, based on the literature review, is linked with low reactivity and positive emotionality. Sociability implies the ability to regulate responses to novelty and engage in social interactions with positive affect. The literature review demonstrated that children with higher levels of positive affect tend to be more engaged with their environment and therefore display more approaching behaviors (Gartstein, Putnam, & Rothbart, 2012). Based on previous research, it was hypothesized that the Sociability factor on the STI would be correlated with five of the CBQ scales: 1. Positively with the Smiling & Laughter scale on the CBQ, because this scale measures the amount of positive affect experienced in response to changes in stimulus intensity, rate, complexity, and social interactions; 2. Positively with the High Intensity Pleasure scale on the CBQ, because this scale assesses the amount of pleasure or enjoyment experienced related to situations involving high stimulus intensity, novelty, and during socialization with others; 3.

Positively with the Approach/Positive Anticipation scale on the CBQ, because this scale measures the amount of excitement and positive anticipation experienced when expecting pleasurable activities including social interactions with others; 4. Positively with the Activity Level scale on the CBQ, because this scale measures the level of gross motor activity including rate and extent of locomotion during social interactions such as games and sports; and 5. Negatively with the Shyness scale on the CBQ, because this scale assesses slow or inhibited approach in social situations involving novelty or uncertainty.

- c. The *Risk Seeking* factor on the STI, based on the literature review, is linked with low reactivity and both positive and negative emotionality. The Risk Seeking factor is associated with seeking out dangerous/risky situations due to both positive and negative affective experiences. Previous research has documented that risk taking behaviors involve a tendency to approach that may cause harm to the individual, but is also an opportunity to obtain a potential reward (Lahat et al., 2012). It was hypothesized that the Risk Seeking factor on the STI would be correlated with five of the CBQ scales: 1. Positively with the Approach/Positive Anticipation scale on the CBQ because this scale measures the amount of excitement (including getting worked up and having a hard time sitting still) and positive anticipation experienced when expecting pleasurable activities; 2. Negatively with the Inhibitory Control scale on the CBQ, because this scale assesses the capacity to suppress inappropriate approach

responses in uncertain and/or risky situations; 3. Positively with the High Intensity Pleasure scale on the CBQ, because this scale assesses the amount of pleasure or enjoyment experienced related to situations involving high stimulus intensity, adventure, risk, and novelty; 4. Positively with the Impulsivity scale on the CBQ, because this scale measures the degree of quick approach of novel situations, being the first to try new activities, and rushing into/approaching new activities without thinking about them ahead of time; and 5. Positively with the Activity Level scale on the CBQ, because this scale measures the level of gross motor activity including approach speed, preference for active games, and energetically approaching.

2. The second purpose of the proposed study was to examine correlates of the approach/avoidance dimension of temperament, aside from other temperament dimensions, that are related to adjustment. More specifically, the relations of approach/avoidance with emotion understanding and with internalizing problems were examined. More difficulty with emotion understanding is directly related to internalizing problems such as depression, fear/anxiety, somatic complaints, worry and rumination (Rieffe & De Rooij, 2012).
 - a. The Prefers Familiar/Routine factor was expected to correlate positively with internalizing problems; and the Sociability factor was expected to correlate negatively with internalizing problems. Research has demonstrated that high levels of negative emotionality, and avoidance, are often linked to the development of internalizing in preschool aged children

(Engle & McElwain, 2011); and the Prefers Familiar/Routine factor is associated with negative emotionality, high reactivity, and avoidant behaviors. In contrast, the Sociability factor is connected to low reactivity and positive emotionality, temperament dispositions that are inconsistent with internalizing problems. Children with higher levels of positive affect tend to be more engaged with their environment and therefore display more approaching behaviors (Gartstein, Putnam, & Rothbart, 2012).

b. It was hypothesized that the Sociability factor on the STI would be positively correlated with Emotion Understanding (ECT-Situations and ECT-Behaviors); and the Prefers Familiar/Routine factor on the STI would be negatively correlated with Emotion Understanding (ECT-Situations and ECT-Behaviors). The ability to understand and regulate emotions is an important milestone in children's social and cognitive development. Children's initial tendency to react is a function of temperament and over time is influenced by effortful control. Children who develop appropriate emotion understanding become more efficient and effective in contexts that elicit emotions (Zuddas, 2012).

3. It was anticipated that the Prefers Familiar/Routine factor would be negatively correlated with Emotion Understanding. It was also hypothesized that Effortful Control would moderate this relationship so that the risk of having difficulty with Emotion Understanding is greater for those rated higher on the Prefers Familiar/Routine factor and lower on Effortful Control. Impairments in emotion understanding, and low effortful control, have been associated with later

development of internalizing problems such as depression and anxiety (Rieffe & De Rooij, 2012).

4. First, it was anticipated that the Prefers Familiar/Routine factor would be negatively correlated with the Internalizing scale on the SCBE. It was also hypothesized that Effortful Control would moderate this relationship so that the risk of having difficulty with Internalizing is greater for those rated higher on the Prefers Familiar/Routine factor and lower on Effortful Control. Second, it was anticipated that the Sociability factor would be positively correlated with the Internalizing scale on the SCBE. It was also hypothesized that Effortful Control would moderate this relationship so that the risk of having difficulty with Internalizing is greater for those rated lower on the Sociability factor and lower on Effortful Control. Previous research has shown that specific patterns of difficult child temperamental traits, including high reactivity and low effortful control, are among the most robust predictors of internalizing (Crawford, Schrock, & Woodruff-Borden, 2011). Studies have also shown that effortful control moderates the adverse impact of high reactivity (Belsky, Friedman, & Hsieh, 2001).

Chapter 3: Research Methods

Participants

The participants were parents, teachers, and preschoolers from a University based preschool setting. The sample was ethnically diverse, but was comprised largely of middle class families that had a connection to the university. The larger temperament study consisted of 139 participants, and subsets of this sample completed each unique measure/phase of this particular study. Either parent was permitted to complete the STI, but the majority of the participants who completed the interview were the mothers of the children in the study. STI data were collected for 92 families participating in the larger correlational temperament study. The CBQ was also completed primarily by the mothers of the children in the study, and was collected for 105 of the participating families. The three ECT measures were completed by a research assistant with each child during preschool hours, and were collected from 101 participants who completed ECT-Situations; 95 participants who completed ECT-Behaviors; and 112 participants who completed ECT- Emotion Identification (ECT-EID). The SCBE was completed by each child's classroom teacher, and was collected from 122 of the participants. Preschooler participants ranged in age from 38 to 82 months old. The mean age of the study sample was 57 months with a standard deviation of 10 months. Tables 4, 5, and 6 displays gender and ethnicity demographic information for the study sample.¹

¹ All parent participants had some post-high school education; 45% had a bachelor's degree or some college education, and 55% had a graduate or professional degree.

Table 4

Gender of Student Participants

Measure	N	Male		Female	
		<i>n</i>	Valid Percent	<i>n</i>	Valid Percent
STI	92	46	50	46	50
CBQ	105	48	46	57	54
ECT-Situations	101	42	42	59	58
ECT-Behaviors	95	37	39	58	61
ECT-EID	112	48	43	64	57
SCBE	122	62	51	60	49

Table 5

Ethnicity of Student Participants

Ethnicity	<i>n</i>	Valid Percent
European-American	52	55
African-American	13	14
Hispanic-American	0	0
Asian-American	15	16
Native-American	0	0
Other	14	15

Table 6

“Other” Ethnicity Breakdown

Ethnicity	<i>n</i>	Valid Percent
African-American & Caucasian	2	14
African-American & Anglo-Saxon	1	7
European	1	7
European-American & Asian-American	1	7
European & Asian	1	7
Haitian-American	1	7
Indian & European-American	1	7
Russian & Caucasian	1	7
Indian	2	14
Japanese	1	7
Irish, Afro-Cuban, & Spanish	2	14

Measurement in the Current Study

Structured Temperament Interview (STI). The STI was created to closely examine the behavioral manifestations of temperament and the explanations parents provide when rating their child's temperament. This interview format provides a unique examination of both the child's behaviors and the parent's understanding and conceptualization of those behaviors. The STI allows for the examination of numerical ratings of behaviors similar to those found on temperament questionnaires and open-ended explanations of behaviors typical of interviews. The STI items differ from existing measures because they allow the interviewee to reflect on his/her quantitative answers and provide qualitative examples of the behaviors they have in mind (Teglasi, 2009).

The current version of the STI includes 112 items that parents answer in the company of a research assistant. The questions provide both the opportunity to rate the child's behaviors on a Likert scale and to provide qualitative examples of the behaviors. The STI includes six dimensions identified in the literature: Attention/Distractibility, Approach/Avoidance, Self-Regulation, Emotionality (divided into positive and negative dimensions), Activity, and Reactivity (intensity and threshold). The research assistant leads the parent through the questions taking notes and tape recording the interview for accuracy of information. The current study focused on the Approach/Avoidance dimension as measured by this instrument. The Approach/Avoidance dimension of temperament on the STI includes 16 items that comprise three approach/avoidance factors (Prefers Familiar/Routine, Sociability, and Risk Seeking). The 16 items that comprise the STI Approach/Avoidance scale can be viewed in Appendix B.

A principal components analysis was previously performed, using direct oblimin

rotation, (Gifford, 2012) to determine which items on the STI Approach/Avoidance scale would comprise each factor (Table 24, Appendix B). Tests of assumption were established for the STI Approach/Avoidance scale. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy ($KMO = .73$) was acceptable, and the Bartlett's Test of Sphericity was significant ($p < .000$). The KMO provides a measure of sampling adequacy to determine if principal components analysis is appropriate to use with the existing sample size. KMO values between 0.5 and 1.0 indicate that principal components analysis is appropriate, and a KMO value of 0.6 is a suggested minimum. The KMO value obtained (.73) confirmed that the sample size was appropriate to use with principal components analysis. Bartlett's Test of Sphericity is a test statistic used to examine the hypothesis that variables are uncorrelated in the population (Fabrigar & Wegener, 2012). The Bartlett's Test of Sphericity was significant ($p < .000$) indicating correlated variables.

The individual item loadings within the Approach/Avoidance STI scale were examined (Table 25, Appendix B) and helped to create the names of each factor. Items 68, 61, 66, 69, 70, and 64 loaded onto Factor 1: Prefers Familiar/Routine. Items 74, 76, 73, 72, 78, 75, and 77 loaded onto Factor 2: Sociability. Finally, items 63, 71, and 65 loaded onto Factor 3: Risk Seeking.

The principal components analysis determined that three factors comprised the Approach/Avoidance scale on the STI. The two STI items with the highest loadings on their respective factors were chosen in order to name each factor. The three STI factors are Prefers Familiar/Routine, Sociability, and Risk Seeking (Table 26, Appendix B).

The STI Approach/Avoidance dimension achieved the following internal consistency alphas: Prefers Familiar/Routine .77 (6 items), Sociability .80 (7 items), and

Risk Seeking .82 (3 items). Pearson correlations between the Prefers Familiar/Routine and the Sociability factors, and between the Prefers Familiar/Routine and Risk Seeking factors were significantly negatively correlated. There was no significant correlation between the Sociability and Risk Seeking factors. As hypothesized, these are independent facets of approach and are expected to have different developmental outcomes.

Children's Behavior Questionnaire – short form (CBQ). The Children's Behavior Questionnaire (CBQ) provides a comprehensive assessment of a child's temperament and is appropriate for use with children ages 3 to 8 years old. The CBQ is grounded in temperament theory that considers constitutionally based individual differences a result of reactivity and self-regulation that is influenced over time by heredity and experience (Putnam & Rothbart, 2006). The CBQ, Short Form provides a viable alternative for researchers and clinicians who lack the time and/or resources to administer the more reliable and extensively validated 195-item measure. The CBQ, Short Form consists of 94 statements that describe behaviors in which a parent rates the degree to which each statement accurately describes their child. Each item is followed by a 7-point Likert rating scale ranging from 1 (extremely untrue of your child) to 7 (extremely true of your child). These 94 items comprise 15 unique scales: Activity Level, Anger/Frustration, Approach/Positive Anticipation, Attentional Focusing, Discomfort, Soothability, Fear, High Intensity Pleasure, Impulsivity, Inhibitory Control, Low Intensity Pleasure, Perceptual Sensitivity, Sadness, Shyness, and Smiling & Laughter (Putnam & Rothbart, 2006).

The CBQ, Short Form achieved the following internal consistency alphas: Activity Level .75, Anger/Frustration .76, Approach/Positive Anticipation .65, Attentional Focusing .75, Discomfort .79, Soothability .73, Fear .68, High Intensity Pleasure .72, Impulsivity .72, Inhibitory Control .72, Low Intensity Pleasure .69, Perceptual Sensitivity .73, Sadness .61, Shyness .85, and Smiling & Laughter .71. The recommended benchmark alpha of .65 or higher was achieved by 14 of the 15 scales. A confirmatory factor analysis of the CBQ, Short Form confirmed orthogonality of each of the unique scales. Furthermore, patterns of stability were consistent between the standard and short forms of the CBQ (Putnam & Rothbart, 2006).

Emotion Comprehension Test. The Emotion Comprehension Test (ECT) is an adaptation of existing measures, developed in 2007, of emotion understanding that can be administered to preschoolers to assess their ability to identify common facial emotions. It was developed based on the Affect Knowledge Test (AKT) (Denham, 1986) and the Assessment of Children's Emotion Skills (ACES) (Schultz, Izard, & Bear, 2004). Similar to the ACES, the ECT includes pictures of children's faces with various emotional expressions, and asks participants to identify the pictured emotions. It also includes short vignettes to assess how children attribute emotions to situational/behavioral cues.

The ECT begins with a basic emotion identification task in which children are presented with 21 pictures depicting the following basic emotions: happy, sad, mad, scared, or no feeling (neutral). The child is shown the pictures of real children and is asked to choose one of the five emotions to describe how the child pictured is feeling. The next section of the ECT includes a set of 15 vignettes that provide situational cues,

and 14 vignettes that provide behavioral cues to which emotions the characters may be experiencing. The research assistant acts out each of the vignettes using a gender-neutral puppet. The child is again asked to choose one of the five emotions (happy, sad, mad, scared, or no feeling) to describe how the character is feeling. The last section of the ECT includes an open-ended assessment of emotion understanding that asks children why they chose a particular emotion on 4 of the vignettes with situational cues and 3 of the vignettes with behavioral cues.

Children's responses for how the characters were feeling were then rescored across the different vignettes using the following codes: 1 = incorrect emotional valence, clearly incorrect; 2 = same emotional valence, incorrect; and 3 = same emotional valence, correct. An example of an item that would be considered within the same emotional valence is a child giving the answer sad instead of mad. The child earns partial credit for items in which they understand the correct emotional valence, but do not choose the exact answer. Higher scores across the vignettes signify better understanding of emotions in specific situations and based on particular behavioral examples.

The internal consistency alphas of the ECT subtests were: Emotion Identification .80, Emotions-Situations .81, and Emotions-Behaviors .63. Pearson correlations between the Emotion Identification and Emotions-Situations subtests, and the Emotions-Situations and Emotions-Behaviors subtests were significantly positively correlated. Emotion comprehension across all three subtests was significantly positively correlated with age. The current study incorporated all three subtests of the ECT, but primarily focused on the ECT-Situations subtest.

Social Competence and Behavior Evaluation (SCBE). The Social Competence and Behavior Evaluation scale (SCBE), formerly known as the Preschool Socio-Affective Profile, is an 80-item Likert rating scale used to measure social competence, emotion regulation and expression, and adjustment difficulties in children ages 30 to 78 months. It was standardized with an ethnically diverse sample. This questionnaire is typically completed by preschool teachers and is composed of 8 scales that comprise positive and negative behaviors typically observed in a preschool setting. The two factors of the SCBE represent distinct internalizing and externalizing behavioral profiles. The SCBE has been used by researchers, educators, and clinicians to assess the behavioral features of specific emotional problems in children in the preschool setting. Researchers have used the SCBE as a screening instrument to select samples of children considered high-risk; in longitudinal studies examining the development of social competence; in intervention studies as a measure of treatment effects; and in experimental research on social and emotional development. In addition, educators and clinicians have used the SCBE as a measure of behavioral and emotional problems in preschool age children (LaFreniere & Dumas, 1996).

The SCBE provides 4 summary scales: Social Competence, Internalizing Problems, Externalizing Problems, and General Adaptation. Scale scores are represented by T-scores (with a mean of 50 and a standard deviation of 10), with higher scores on General Adaptation representing better adjustment. The Social Competence Scale consists of all of the questions that reflect positive behaviors, social maturity, resiliency, and prosocial behaviors. The Internalizing Scale is made up of items reflecting undesirable and dependent behaviors. The Externalizing Scale consists of items

reflecting angry, aggressive, egotistical, and oppositional behaviors. Lastly, the General Adaptation Scale provides a score for performance across all items (Anthony, Anthony, Glanville, Naiman, Waanders, & Shaffer, 2005).

The SCBE has a three-factor structure (Social Competence, Internalizing, and Externalizing); with high reliability, internal consistency, temporal stability; and orthogonality (independence) of the two factors representing internalizing and externalizing behavioral profiles. The inter-rater reliability estimates for the SCBE were high across samples, and ranged from .72 to .89. The internal consistency, or the degree to which the items of each scale come together around a central tendency, was high in each sample, and fell in the range .79 to .91 (LaFreniere & Dumas, 1996).

The current study focused primarily on the Internalizing items on the SCBE. The Internalizing scale on the SCBE is comprised of items that assess anxious, depressed, isolated, and overly dependent behaviors. Higher scores on the Internalizing scale indicate desirable levels of adjustment and lower scores indicate poor adjustment. In other words, children who score low are generally anxious and fearful, and typically withdraw from social situations (LaFreniere & Dumas, 2003). Preschoolers rated low on the Internalizing scale typically engage in periphery activities during group play and engage in parallel play more than interactive play with peers. In addition, teachers often view children with low ratings as sad, depressed, tired, and isolated. These preschoolers often have poor self-concepts and are less mature than their same age peers. They require much adult assistance and reassurance to complete tasks within their ability (LaFreniere & Dumas, 1996).

Procedure

The STI, CBQ, ECT, and SCBE data are archival, having been collected between 2007 and 2012. The data collection procedures are outlined below.

First, the research staff discussed research objectives with teachers/staff at the university based preschool and then with parents at back to school night. The researchers then disseminated consent forms to parents of children in the relevant age range. Families and teachers were given multiple opportunities over the course of data collection to participate. The only basis for selection for the study was the age of the participating child and parental permission.

Informational cover letters and informed consent forms describing the study were distributed to the parents of the participating preschoolers. Signed permission forms from parents or guardians constituted informed consent on behalf of the students. For this portion of the study, parent permission was obtained to meet with and complete the STI with a research assistant; and parents completed the CBQ independently and returned it to their child's classroom teacher. The ECT was completed with each child individually during preschool hours with the support of a research assistant. SCBE rating scales were also distributed to the teachers of these participating families and were returned to research assistants upon completion.

A research team divided the STI's among each other for completion. Each data collector was trained in the administration of the STI to assure consistency and reliability of data collection. The measure is typically administered in one, approximately 120-minute session with one of the child's parents. However, the interview can be broken into several shorter interviews to accommodate the parent's schedule. All parents are

given a copy of the STI to follow along with during the interview to allow them to reread questions and reflect on the answer choices. The research team also divided the ECT's among each other for completion, and met with each child within the preschool setting to complete this task. The CBQ and SCBE were distributed to parents and teachers respectively and were collected upon completion.

All materials and data collected for the project are confidential, stored in locked file cabinets in the office of Dr. Teglassi, located at 3214 Benjamin Building in the Department of Counseling, Higher Education, and Special Education. Only the people directly involved in the research have access to materials. There is a file folder for each child in which all data for that child is kept, and each child is assigned a case number. A master sheet of names corresponding with case numbers is kept in a locked drawer. Data entry took place on a secure computer and, each child was only identified by a case number. All data were double entered for quality assurance.

Missing Data

The data used in the current study were part of a larger data set examining preschool temperament. Missing data and procedures used to account for missing data are detailed below.

Three participants were missing one item each across their STI data. Participant 9 was missing item 61; participant 10 was missing item 71, and participant 20 was missing item 77. Each of these items fell within different Approach/Avoidance factors on the STI. As a result, for these three participants, their factor scores were an average of the items answered for that particular factor. In other words, participant 9 had an average of 5 items, instead of 6, comprising his/her score for the Prefers Familiar/Routine factor;

participant 10 had an average of 2 items, instead of 3, comprising his/her score for the Risk Seeking factor; and participant 20 had an average of 6 items, instead of 7, comprising his/her Sociability score.

For each bivariate correlation, pairwise deletion procedures were used in order to obtain accurate data for each correlation. In other words, each correlation was representative of data that were present across both of the scales in comparison. The bivariate correlation tables contain each n listed separately under each correlation. The listwise deletion procedure was considered, but did not significantly change the correlation results.

Each regression model used listwise deletion procedures in order to obtain accurate data for those participants who completed all measures included in that particular regression. As a result, $n = 63$ for the regression model predicting Emotion Understanding (ECT-Situations); and, $n = 66$ for both of the regression models predicting Internalizing (SCBE).

Analytic Plan

The overall aim of this study was to examine the relationship of the approach/avoidance dimension of temperament with related temperament constructs, and with emotion understanding and internalizing problems. To address that aim, the hypotheses stated in Table 7 were tested using correlational and regression analyses. The hypothesized interaction relationships for research hypotheses 3 and 4 are detailed in Table 8.

Table 7

Research Hypotheses

Hypotheses	Variables	Statistical Procedure
<p>1. It was hypothesized that the three identified approach/avoidance factors on the STI would correlate with specific scales on the CBQ based on underlying dimensions of reactivity and emotionality, and scales that measure similar constructs/phenomena.</p>	<p>A. Positive correlations predicted between the Prefers Familiar/Routine factor on the STI and the Low Intensity Pleasure, Fear, and Shyness scales on the CBQ; negative correlation predicted between the Prefers Familiar/Routine factor on the STI and the Impulsivity scale on the CBQ.</p>	<p>1. Pearson correlation analyses were performed between the listed STI factors and CBQ scales.</p>
	<p>B. Positive correlations predicted between the Sociability factor on the STI and the Approach/Positive Anticipation, Smiling and Laughter, High Intensity Pleasure, and Activity Level scales on the CBQ; negative correlation predicted between the Sociability factor on the STI and the Shyness scale on the CBQ.</p>	
	<p>C. Positive correlations predicted between the Risk Seeking factor on the STI and the Approach/Positive Anticipation, Impulsivity, Activity Level, and High Intensity Pleasure scales on the CBQ; negative correlation predicted between the Risk Seeking factor on the STI and the Inhibitory Control scale on the CBQ.</p>	

Research Hypotheses

Hypotheses	Variables	Statistical Procedure
<p>2. It was hypothesized that emotion understanding and internalizing are non-temperament factors that are correlated with temperamental approach/avoidance. Specifically, the Prefers Familiar/Routine factor on the STI was hypothesized to correlate positively with internalizing behaviors; and the Sociability factor on the STI was hypothesized to correlate negatively with internalizing behaviors. In addition, the Prefers Familiar/Routine factor on the STI was hypothesized to correlate negatively with Emotion Understanding on the ECT. Whereas, the Sociability factor on the STI was hypothesized to correlate positively with Emotion Understanding on the ECT.</p>	<p>A. Note: High T-scores on the SCBE Internalizing scale signify better adjustment and fewer internalizing behaviors. Therefore, a negative correlation was predicted between the Prefers Familiar/Routine factor on the STI and the Internalizing scale on the SCBE; a positive correlation was predicted between the Sociability factor on the STI and the Internalizing scale on the SCBE.</p> <p>B. Negative correlations predicted between the Prefers Familiar/Routine factor on the STI, and the ECT-Situations and ECT-Behaviors measures on the ECT; positive correlations were predicted between the Sociability factor on the STI and the ECT-Situations and ECT-Behaviors measures on the ECT.</p>	<p>2. Pearson correlation analyses were performed between the 3 STI factors and Internalizing on the SCBE; and between the 3 STI factors and the 3 Emotion Understanding measures on the ECT.</p>

Research Hypotheses

Hypotheses	Variables	Statistical Procedure
3. It was hypothesized that Effortful Control would moderate the relationship between the Prefers Familiar/Routine factor on the STI and Emotion Understanding on the ECT. Specifically, children who were rated high on the Prefers Familiar/Routine factor, and rated low on Effortful Control, were predicted to have the most difficulty with emotion understanding.	A. STI factor Prefers Familiar/Routine. B. CBQ scales of Attentional Focusing and Inhibitory Control were composited as the measure of Effortful Control. C. The ECT measure(s) that were significantly correlated with the Prefers Familiar/Routine factor in the bivariate correlational analyses (ECT-Situations).	3. Hierarchical regression with two steps: a main effects model predicting Emotion Understanding (ECT-Situations) from the Prefers Familiar/Routine STI factor and the Effortful Control composite from the CBQ; and a main effects plus interaction model predicting Emotion Understanding (ECT-Situations) from the Prefers Familiar/Routine STI factor, Effortful Control composite, and the interaction between them.

Research Hypotheses

Hypotheses	Variables	Statistical Procedure
<p>4. It was hypothesized that Effortful Control would moderate the relationship between the Prefers Familiar/Routine factor on the STI, and Internalizing on the SCBE. Specifically, children who were rated high on the Prefers Familiar/Routine factor on the STI, and rated low on Effortful Control, were predicted to have the most internalizing behaviors. It was also hypothesized that Effortful Control would moderate the relationship between the Sociability factor on the STI and Internalizing on the SCBE. Specifically, children who were rated low on the Sociability factor on the STI, and rated low on Effortful Control, were predicted to have the most internalizing behaviors.</p>	<p>A. STI factors Prefers Familiar/Routine and Sociability.</p> <p>B. CBQ scales of Attentional Focusing and Inhibitory Control were composited as the measure of Effortful Control</p> <p>C. Internalizing scale on the SCBE.</p>	<p>4. Two hierarchical regressions: 1. Hierarchical regression with two steps: a main effects model predicting Internalizing (SCBE) from the Prefers Familiar/Routine STI factor, and the Effortful Control composite from the CBQ; and a main effects plus interaction model predicting Internalizing (SCBE) from the Prefers Familiar/Routine STI factor, Effortful Control composite, and the interaction between them. 2. Hierarchical regression with two steps: a main effects model predicting Internalizing (SCBE) from the Sociability STI factor, and the Effortful Control composite from the CBQ; and a main effects plus interaction model predicting Internalizing (SCBE) from the Sociability STI factor, Effortful Control composite, and the interaction between them.</p>

Table 8

Interaction Hypotheses

Hypotheses	Variables	Expected Interaction Relationship
It was hypothesized that Effortful Control would moderate the relationship between the Prefers Familiar/Routine factor on the STI and Emotion Understanding on the ECT.	A. STI factor Prefers Familiar/Routine. B. CBQ composite – Effortful Control C. ECT-Situations	It was hypothesized that children rated high on Prefers Familiar/Routine, and low on Effortful Control, would have the most difficulty with Emotion Understanding; and children rated high on Prefers Familiar/Routine and high on Effortful Control, would have the best Emotion Understanding.
It was hypothesized that Effortful Control would moderate the relationship between the Prefers Familiar/Routine factor on the STI, and Internalizing on the SCBE.	A. STI factor Prefers Familiar/Routine B. CBQ composite – Effortful Control C. SCBE – Internalizing	It was hypothesized that children rated high on Prefers Familiar/Routine, and low of Effortful Control, would have the most Internalizing problems; and children rated high on Prefers Familiar/Routine, and high on Effortful Control, would have the least Internalizing problems.
It was hypothesized that Effortful Control would moderate the relationship between the Sociability factor on the STI and Internalizing on the SCBE.	A. STI factor Sociability B. CBQ composite – Effortful Control C. SCBE – Internalizing	It was hypothesized that children rated low on Sociability, and low on Effortful Control, would have the most Internalizing behaviors; and children rated high on Sociability, and high on Effortful Control, would have the least Internalizing problems.

Chapter 4: Results

Internal Consistency

Internal consistency data published for the STI, CBQ, ECT, and SCBE were described in Chapter 3. Internal consistency data for the STI, CBQ, and ECT were calculated again in order to demonstrate the reliability for the current study. The SCBE internal consistency data were not recalculated because items comprising each of the SCBE scales were not available in the current data set. The reliability data are displayed by each measure in the tables below.

Cronbach's alphas were calculated for the items comprising each of the 3 factors on the Approach/Avoidance scale of the STI to demonstrate the internal consistency of this scale for the current study. Table 9 displays the number of items comprising each of the 3 factors, along with their corresponding alphas.

Table 9

Internal Consistency of the STI Approach/Avoidance Factors

STI Factor	Number of Items	Cronbach's Alpha
Prefers Familiar/Routine	6	.77
Sociability	7	.80
Risk Seeking	3	.82

Cronbach's alphas were calculated for the items comprising each of the 15 scales on the CBQ to demonstrate the internal consistency of this measure for the current study. Table 10 displays the number of items comprising each of the 15 scales, along with their corresponding alphas.

Table 10

Internal Consistency of the CBQ Scales

CBQ Scale	Number of Items	Cronbach's Alpha
Activity Level	7	.69
Anger/Frustration	6	.80
Approach/Positive Anticipation	6	.68
Attentional Focusing	6	.78
Discomfort	6	.86
Falling Reactivity/Soothability	6	.79
Fear	6	.74
High Intensity Pleasure	6	.74
Impulsivity	6	.73
Inhibitory Control	6	.65
Low Intensity Pleasure	8	.66
Perceptual Sensitivity	6	.76
Sadness	7	.65
Shyness	6	.86
Smiling and Laughter	6	.61

Cronbach's alphas were calculated for each of the 3 measures comprising the ECT to demonstrate the internal consistency of this measure for the current study. Table 11 displays the number of items comprising each of the 3 measures, along with their corresponding alphas.

Table 11

Internal Consistency of the ECT Measures

ECT Scale	Number of Items	Cronbach's Alpha
ECT – Emotion Identification	21	.69
ECT – Situations	15	.79
ECT – Behaviors	15	.77

Study Results

Results were organized by the four study hypotheses and are presented in separate tables. The sample size for each of the analyses can be found in parenthesis below each of the correlations. Correlation coefficients were interpreted based on Cohen's effect size

guidelines for behavioral sciences. According to Cohen, correlation coefficients in the order of .10 are “small”, .30 are “moderate”, and .50 are “large” (Cohen, 1988).

Research hypothesis 1. It was hypothesized that the three identified approach/avoidance factors on the STI (Prefers Familiar/Routine, Sociability, and Risk Seeking) would correlate with specific scales on the CBQ based on: underlying dimensions of reactivity and emotionality, and scales that measure similar constructs/phenomena.

Table 12 depicts the correlations between the Prefers Familiar/Routine factor on the STI and the four CBQ scales (Fear, Shyness, low Impulsivity, and Low Intensity Pleasure) predicted to be correlated based on underlying aspects of negative emotionality and high reactivity. As predicted, a statistically significant moderate positive correlation was found between the Prefers Familiar/Routine factor and the Shyness scale $r(72) = .40$, $p < .001$. Children in this sample who were rated as having a high preference for routine and familiar activities were also rated as more shy. Also as predicted, a statistically significant large negative correlation was found between the Prefers Familiar/Routine factor and the Impulsivity scale $r(71) = -.50$, $p < .001$. Children from this sample who preferred routine and familiar activities were less likely to act impulsively. Contrary to prediction, a statistically significant relationship was not found between the Prefers Familiar/Routine factor and the Fear scale $r(58) = .18$, $p = .172$, or the Low Intensity Pleasure scale $r(71) = -.13$, $p = .257$. Children from this sample who were rated as having a high preference for familiar and routine activities were not rated by parents as fearful, or as having a preference for low stimulus activities.

Table 12

Correlation Matrix for Prefers Familiar/Routine STI Factor and CBQ Scales

	Prefers Familiar/Routine (<i>n</i> = 92)	Fear (<i>n</i> = 80)	Shyness (<i>n</i> = 101)	Low Intensity Pleasure (<i>n</i> = 98)	Impulsivity (<i>n</i> = 98)
Prefers Familiar/Routine		.18 (<i>n</i> = 60)	.40** (<i>n</i> = 74)	-.13 (<i>n</i> = 73)	-.50** (<i>n</i> = 73)
Fear			.28* (<i>n</i> = 78)	-.11 (<i>n</i> = 74)	.06 (<i>n</i> = 76)
Shyness				-.07 (<i>n</i> = 95)	-.54** (<i>n</i> = 96)
Low Intensity Pleasure					-.02 (<i>n</i> = 93)
Impulsivity					

p* < .05; *p* < .01

Table 13 depicts the correlations between the Sociability factor on the STI and the five CBQ scales (High Intensity Pleasure, Smiling & Laughter, Approach/Positive Anticipation, Activity Level, and low Shyness) predicted to be correlated based on underlying aspects of low reactivity and positive emotionality. As predicted, a statistically significant moderate positive correlation was found between the Sociability factor and the Smiling & Laughter scale $r(73) = .38, p = .001$. Children from this sample who were rated high in sociability were also rated as having high levels of positive affect (i.e. smiling and laughter). Also as predicted, a statistically significant large negative correlation was found between the Sociability factor and the Shyness scale $r(72) = -.67, p < .001$. Not surprisingly, children from this sample who were rated as more sociable were not rated as being shy. Also in line with prediction, a statistically significant small positive correlation was found between the Sociability factor and the Activity Level scale

$r(76) = .23, p = .046$. Sociable children in the current study were also viewed as more active, which has been well documented in previous research. Contrary to prediction, a statistically significant relationship was not found between the Sociability factor and the High Intensity Pleasure scale $r(73) = .08, p = .514$. Children from this sample who were rated as sociable were not rated as enjoying situations involving high stimulus intensity or novelty. The relationship between the Sociability factor and the Approach/Positive Anticipation scale $r(74) = .22, p = .054$ was not statistically significant, although it was approaching significance. Children from this sample who were rated as sociable were more likely to be rated as excited and positively anticipating expected pleasurable activities. These findings are consistent with the unique dimensions of temperamental approach on the STI; with High Intensity Pleasure and Approach/Positive Anticipation being more correlated with risk seeking forms of approach.

Table 13

Correlation Matrix for Sociability STI Factor and CBQ Scales

	Sociability (<i>n</i> = 92)	High Intensity Pleasure (<i>n</i> = 99)	Smiling & Laughter (<i>n</i> = 101)	Approach/Positive Anticipation (<i>n</i> = 101)	Shyness (<i>n</i> = 101)	Activity Level (<i>n</i> = 105)
Sociability		.08 (<i>n</i> = 75)	.38** (<i>n</i> = 75)	.22 (<i>n</i> = 76)	-.67** (<i>n</i> = 74)	.23* (<i>n</i> = 78)
High Intensity Pleasure			.09 (<i>n</i> = 95)	.14 (<i>n</i> = 95)	.01 (<i>n</i> = 95)	.49** (<i>n</i> = 98)
Smiling & Laughter				.21* (<i>n</i> = 97)	-.25* (<i>n</i> = 97)	.19 (<i>n</i> = 101)
Approach/Positive Anticipation					-.18 (<i>n</i> = 97)	.36** (<i>n</i> = 101)
Shyness						-.19 (<i>n</i> = 101)
Activity Level						

* $p < .05$; ** $p < .01$

Table 14 depicts the correlations between the Risk Seeking factor on the STI and the five CBQ scales (High Intensity Pleasure, low Inhibitory Control, Approach/Positive Anticipation, Impulsivity, and Activity Level) predicted to be correlated based on underlying aspects of low reactivity and positive/negative emotionality. As predicted, a statistically significant moderate positive correlation was found between the Risk Seeking factor and the High Intensity Pleasure scale $r(73) = .48, p < .001$. Not surprisingly, children in this sample who sought out risky situations also enjoyed high stimulus intensity and novelty. As predicted, a statistically significant moderate positive correlation was found between the Risk Seeking factor and the Impulsivity scale $r(71) = .37, p = .001$. Children from this sample who sought out risky/adventurous situations

were also rated as more impulsive. Also as predicted, a statistically significant small positive correlation was found between the Risk Seeking factor and the Activity Level scale $r(76) = .23, p = .041$. Children who sought out adventure were also rated as being more physically active. Contrary to prediction, a statistically significant relationship was not found between the Risk Seeking factor and the Inhibitory Control (low) scale $r(71) = -.02, p = .857$, or the Approach/Positive Anticipation scale $r(74) = -.01, p = .925$. Children in this sample who were rated as risk seeking did not have difficulty suppressing approach responses, nor did they become excited when expecting pleasurable activities.

Table 14

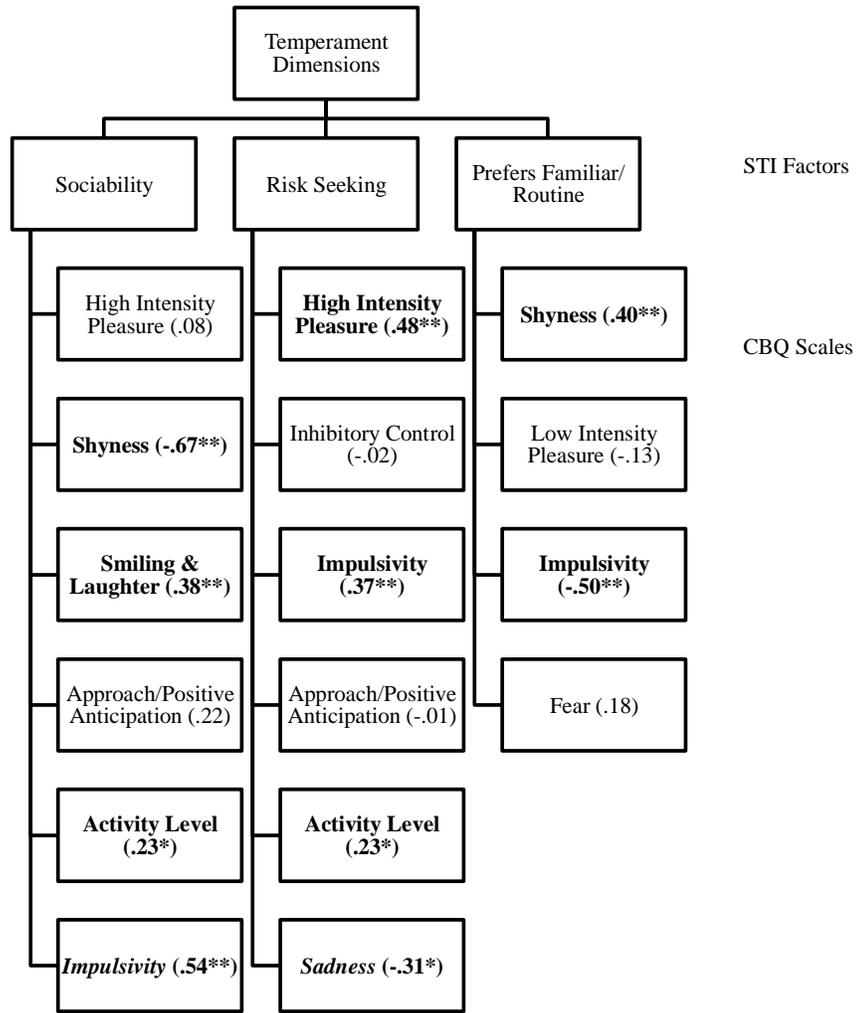
Correlation Matrix for Risk Seeking STI Factor and CBQ Scales

	Risk Seeking ($n = 92$)	High Intensity Pleasure ($n = 99$)	Inhibitory Control ($n = 99$)	Approach/Positive Anticipation ($n = 101$)	Impulsivity ($n = 98$)	Activity Level ($n = 105$)
Risk Seeking		.48** ($n = 75$)	-.02 ($n = 73$)	-.01 ($n = 76$)	.37** ($n = 73$)	.23* ($n = 78$)
High Intensity Pleasure			-.29** ($n = 93$)	.14 ($n = 95$)	.51** ($n = 94$)	.49** ($n = 98$)
Inhibitory Control				-.03 ($n = 96$)	-.37** ($n = 93$)	-.37** ($n = 99$)
Approach/Positive Anticipation					.30** ($n = 95$)	.36** ($n = 101$)
Impulsivity						.55** ($n = 98$)
Activity Level						

* $p < .05$; ** $p < .01$

Figure 5 illustrates the hypothesized correlations between the 3 STI factors and the CBQ scales, and also includes two significant correlations that were not part of the

hypotheses. In addition, comprehensive tables of correlations between each of the 3 STI factors and all 15 CBQ scales can be found in Appendix D.



* $p < .05$; ** $p < .01$

Note. Statistically significant correlations are bolded in the figure above; statistically significant correlations that were found, but were not part of the hypotheses, are bolded and italicized in the figure above.

Figure 5. Model of hypothesized and significant correlations between the Structured Temperament Interview (STI) Approach/Avoidance factors and the Children’s Behavior Questionnaire (CBQ) scales based on underlying aspects of emotionality and reactivity.

Research hypothesis 2. It was hypothesized that emotion understanding and internalizing are non-temperament factors that are correlated with temperamental approach/avoidance. Specifically, the Prefers Familiar/Routine factor on the STI was hypothesized to positively correlate with internalizing behaviors; and the Sociability factor on the STI was hypothesized to negatively correlate with internalizing behaviors. In addition, the Sociability factor on the STI was hypothesized to positively correlate with Emotion Understanding on the ECT; whereas, the Prefers Familiar/Routine factor on the STI was expected to negatively correlate with Emotion Understanding on the ECT.

It is important to note that low T-scores on the SCBE Internalizing scale represent more internalizing problems, and high T-scores on the SCBE Internalizing scale represent better adjustment (fewer internalizing behaviors). Table 15 depicts the relationships between each of the three STI factors (Prefers Familiar/Routine, Sociability, and Risk Seeking) and the Internalizing scale on the SCBE. It was hypothesized that a negative correlation would exist between the Prefers Familiar/Routine factor and the SCBE Internalizing scale; and that a positive correlation would exist between the Sociability factor and the SCBE Internalizing scale. As predicted, a statistically significant small negative correlation was found between the Prefers Familiar/Routine factor and the Internalizing scale $r(76) = -.28, p = .013$. Children in this sample who were rated as preferring to engage in familiar and routine activities were also rated as having more internalizing behaviors. Also as predicted, a statistically significant moderate positive correlation was found between the Sociability factor and the Internalizing scale $r(76) = .33, p = .003$. Children in this sample who were rated as being more sociable were also rated as being better behaviorally adjusted; they did not display internalizing concerns.

Table 15

Correlation Matrix for STI Factors and Internalizing on SCBE

	Prefers Familiar/Routine (<i>n</i> = 92)	Sociability (<i>n</i> = 92)	Risk Seeking (<i>n</i> = 92)	Internalizing (<i>n</i> = 121)
Prefers Familiar/Routine		-.34** (<i>n</i> = 92)	-.27** (<i>n</i> = 92)	-.28* (<i>n</i> = 78)
Sociability			.13 (<i>n</i> = 92)	.33** (<i>n</i> = 78)
Risk Seeking				.05 (<i>n</i> = 78)
Internalizing				

Note. Low T-scores on the Internalizing scale represent more internalizing behaviors.
p* < .05; *p* < .01

Table 16 depicts the relationships between each of the three STI factors (Prefers Familiar/Routine, Sociability, and Risk Seeking) and each of the three measures on the ECT (ECT- EID, ECT – Situations, and ECT – Behaviors). It was hypothesized that the Sociability STI factor would be positively correlated with the ECT-Situations and ECT-Behaviors measures. It was also predicted that the Prefers Familiar/Routine STI factor would be negatively correlated with the ECT-Situations and ECT-Behaviors measures.

As predicted, a statistically significant moderate negative correlation was found between the Prefers Familiar/Routine factor and the ECT – Situations measure $r(69) = -.34, p = .003$. Children in this sample who preferred to engage in familiar activities earned lower scores on a measure of emotion understanding when presented with different hypothetical situations. Contrary to prediction, a statistically significant relationship did not exist between the Prefers Familiar/Routine factor and the ECT-Behaviors measure $r(66) = -.23, p = .062$. Given their developmental level, the best

measure of emotion understanding in preschool is assessed by hypothetical emotion-evoking situations.

Also contrary to prediction, statistically significant relationships did not exist between the Sociability STI factor and the hypothesized ECT measures: ECT-Situations $r(69) = .06, p = .637$; or ECT-Behaviors $r(66) = .04, p = .730$. Children in this sample who were rated as more sociable did not perform better than their peers on measures of emotion understanding.

Table 16

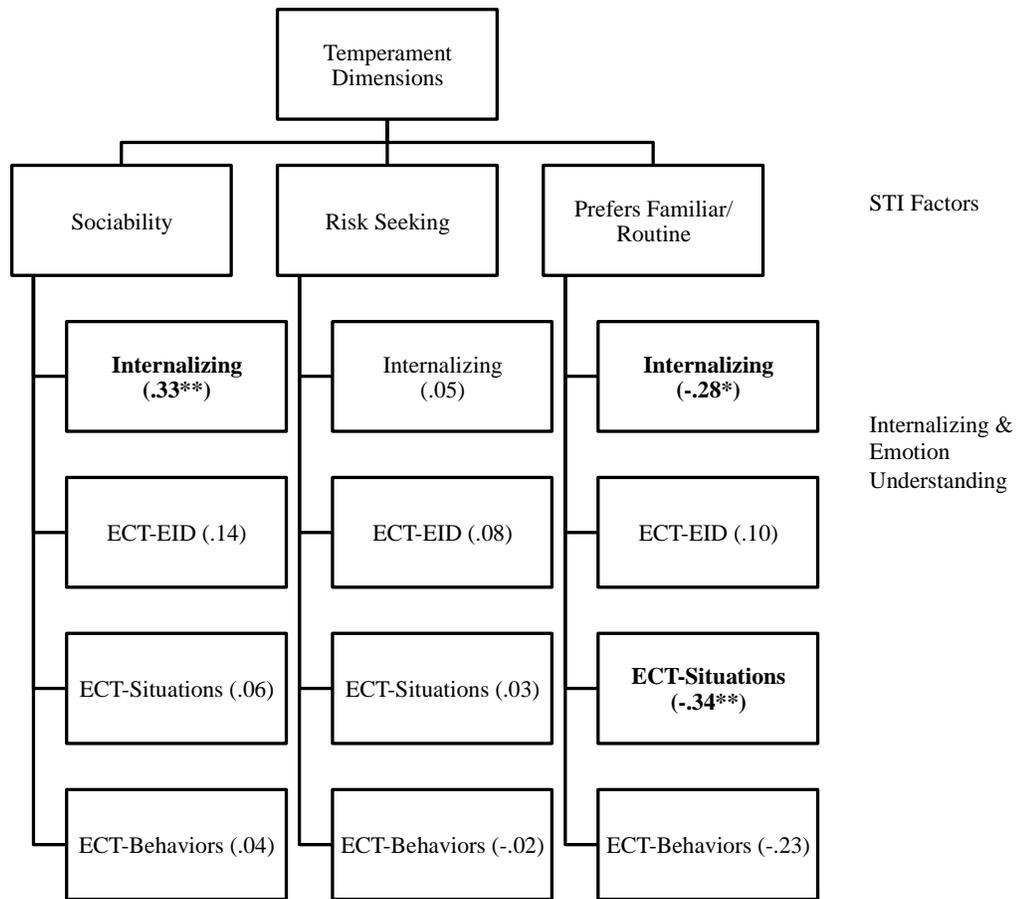
Correlation Matrix for STI Factors and Emotion Understanding on ECT

	Prefers Familiar/Routine (<i>n</i> = 92)	Sociability (<i>n</i> = 92)	Risk Seeking (<i>n</i> = 92)	ECT-EID (<i>n</i> = 105)	ECT-Situations (<i>n</i> = 103)	ECT-Behaviors (<i>n</i> = 97)
Prefers Familiar/Routine		-.34** (<i>n</i> = 92)	-.27** (<i>n</i> = 92)	.10 (<i>n</i> = 70)	-.34** (<i>n</i> = 71)	-.23 (<i>n</i> = 68)
Sociability			.13 (<i>n</i> = 92)	.14 (<i>n</i> = 70)	.06 (<i>n</i> = 71)	.04 (<i>n</i> = 68)
Risk Seeking				.08 (<i>n</i> = 70)	.03 (<i>n</i> = 71)	-.02 (<i>n</i> = 68)
ECT-EID					.39** (<i>n</i> = 94)	.20 (<i>n</i> = 89)
ECT-Situations						.49** (<i>n</i> = 96)
ECT-Behaviors						

* $p < .05$; ** $p < .01$

Figure 6 illustrates the hypothesized and statistically significant relationships between the 3 STI Approach/Avoidance factors, the 3 ECT measures, and the

Internalizing scale on the SCBE. It is important to reiterate that high T-scores on the SCBE Internalizing scale represent better overall adjustment, and lower T-scores represent more Internalizing behaviors.



* $p < .05$; ** $p < .01$

Note. Statistically significant correlations are bolded in the figure above; Risk Seeking was not predicted to correlate with Internalizing or Emotion Understanding, but was included in the correlation analyses; it is also important to note that lower T-scores on the Internalizing scale signify more internalizing behaviors, and higher T-scores on the Internalizing scale represent better adjustment.

Figure 6. Model of hypothesized and statistically significant correlations between the Structured Temperament Interview (STI) Approach/Avoidance factors, Emotion Understanding on the Emotion Comprehension Test (ECT), and Internalizing on the Social Competence and Behavior Evaluation scale (SCBE).

Research hypothesis 3. In the bivariate correlations tested in hypothesis 2, it was hypothesized that the Prefers Familiar/Routine STI factor would be negatively correlated with Emotion Understanding on the ECT; and that the Sociability STI factor would be positively correlated with Emotion Understanding on the ECT. The bivariate correlations confirmed that there was a statistically significant moderate negative correlation between the Prefers Familiar/Routine STI factor and the ECT – Situations measure $r(69) = -.34, p = .003$. However, the Sociability STI factor and the Emotion Understanding measures on the ECT were not statistically significantly correlated. These findings demonstrated that children from this sample who preferred to engage in routine and familiar activities had less accurate emotion understanding when presented with hypothetical emotion-evoking situations. In line with these findings, it was hypothesized that Effortful Control (a composite of the CBQ scales Attentional Focusing and Inhibitory Control) would moderate the relationship between the STI Prefers Familiar/Routine factor and the ECT-Situations measure such that children rated higher on the Prefers Familiar/Routine factor, and lower on Effortful Control, would have more difficulty with Emotion Understanding.

A hierarchical linear regression model was used to test whether Effortful Control moderated the relationship between the Prefers Familiar/Routine (STI) factor and Emotion Understanding (ECT-Situations). In Model 1, the Prefers Familiar/Routine (STI) factor was entered as the independent variable, and Effortful Control (CBQ) was entered as the moderator variable $Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \epsilon_i$. In Model 2, the Prefers Familiar/Routine (STI) factor was entered as the independent variable, Effortful Control (CBQ) was entered as the moderator variable, and a product term (Prefers

Familiar/Routine x Effortful Control) was entered as the interaction variable

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 (X_1 * X_2) + \varepsilon_i.$$

Problems with multicollinearity can create issues with detecting interaction effects in multiple regression (Jaccard, Wan, & Turrisi, 1990). An assessment of collinearity, the degree to which two independent variables are correlated, was conducted between the independent variables included in this regression (Prefers Familiar/Routine and Effortful Control). The bivariate correlation between these two variables was not significant $r(77) = -.14, p = .209$, indicating independent variables. Furthermore, the recommended test of tolerance to detect multicollinearity ($1 - R^2$) was .81 for Model 1 and .80 for Model 2. A minimum tolerance level between .10 and .20 has been recommended in the literature, and higher tolerance levels are preferred. These tests demonstrated that the regression predicting ECT-Situations from Prefers Familiar/Routine, Effortful Control, and their interaction, did not have problems with collinearity or multicollinearity.

Table 17 represents the hierarchical regression model predicting Emotion Understanding (ECT), specifically ECT-Situations, from the Prefers Familiar/Routine factor (STI), the Effortful Control composite created from the Inhibitory Control and Attentional Focusing scales (CBQ), and the interaction between the Prefers Familiar/Routine factor and the Effortful Control composite. The main effect of the Prefers Familiar/Routine (STI) factor on ECT-Situations was significant $\beta = -.30, t(62) = -2.5, p = .014$; and, the main effect of Effortful Control (CBQ) on ECT-Situations was also significant $\beta = .28, t(62) = 2.35, p = .022$. There was not a significant effect with the addition of the interaction term (Prefers Familiar/Routine x Effortful Control) $\beta = .59$,

$t(62) = .71, p = .480$. The ΔR^2 was .01 when the interaction term was added in Model 2; the addition of the interaction term did not add to the predictive capacity in explaining ECT-Situations scores.

Model 1, which included the Prefers Familiar/Routine (STI) factor and Effortful Control composite (CBQ), explained a significant proportion of variance in ECT-Situations scores $R^2 = .19, F(2, 60) = 6.93, p = .002$. However, model 2, which included the addition of an interaction term (Prefers Familiar/Routine x Effortful Control), did not contribute additional variance beyond the main effects to ECT-Situations scores $R^2 = .20, F(3, 59) = 4.75, p = .480$. The overall Model 1 was statistically significant $F(2, 60) = 6.93, p = .002$; and the overall Model 2 was statistically significant $F(3, 59) = 4.75, p = .005$. Although both models were statistically significant, the inclusion of the interaction term did not significantly add to the predictive capacity in explaining the variance in scores on ECT-Situations. More detailed information regarding this regression can be found in Appendix E, Tables 33-35.

Table 17

Hierarchical Regression Predicting Emotion Understanding (ECT) from Prefers Familiar/Routine (STI), Effortful Control (CBQ), and their interaction

Predictor	Emotion Understanding ECT – Situations							
	R^2	ΔR^2	p -value	B	$SE B$	β	t	p -value
<u>Model 1</u>								
Prefers Familiar/Routine	.19**	.19	.002	-3.32	1.31	-.30**	-2.5	.01
Effortful Control				2.14	.91	.28*	2.35	.02
<u>Model 2</u>								
Prefers Familiar/Routine	.20	.01	.48	-8.66	7.61	-.78	-1.14	.26
Effortful Control				-.97	4.47	-.13	-.22	.83
Prefers Familiar/Routine x Effortful Control				1.05	1.49	.59	.71	.48

* $p < .05$; ** $p < .01$ ²

² Model 1 was statistically significant $F(2, 60) = 6.93, p = .002$; and Model 2 was statistically significant $F(3, 59) = 4.75, p = .005$

Research hypothesis 4. In the bivariate correlations tested in hypothesis 2, it was hypothesized that the Prefers Familiar/Routine STI factor would be negatively correlated with the SCBE Internalizing scale; and that the Sociability factor would be positively correlated with the SCBE Internalizing scale. It is important to reiterate that these correlations were based on higher T-scores on the SCBE Internalizing scale signifying better adjustment, and lower T-scores signifying more internalizing behaviors.

The bivariate correlations confirmed a statistically significant small negative correlation between the Prefers Familiar/Routine factor and the Internalizing scale $r(76) = -.28, p = .013$. Children in this sample who were rated as preferring to engage in familiar and routine activities were also rated as having more internalizing behaviors. The bivariate correlations also confirmed a statistically significant moderate positive correlation between the Sociability factor and the Internalizing scale $r(76) = .33, p = .003$. Children in this sample who were rated as being more sociable were also rated as being better behaviorally adjusted; they did not display internalizing concerns. In line with these findings, two additional hypotheses were made: 1. It was hypothesized that Effortful Control would moderate the relationship between the Prefers Familiar/Routine STI factor and the SCBE Internalizing scale such that children rated higher on the Prefers Familiar/Routine factor and lower on Effortful Control would have more Internalizing behaviors; and 2. It was hypothesized that Effortful Control would moderate the relationship between the Sociability STI factor and the SCBE Internalizing scale such that children rated lower on the Sociability factor and lower on Effortful Control would have more Internalizing behaviors.

A hierarchical linear regression model was used to test whether Effortful Control moderated the relationship between the Sociability (STI) factor and Internalizing (SCBE). In Model 1, the Sociability (STI) factor was entered as the independent variable, and Effortful Control (CBQ) was entered as the moderator variable $Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon_i$. In Model 2, the Sociability (STI) factor was entered as the independent variable, Effortful Control (CBQ) was entered as the moderator variable, and a product term (Sociability x Effortful Control) was entered as the interaction variable $Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 (X_1 * X_2) + \varepsilon_i$.

An assessment of collinearity, the degree to which two independent variables are correlated, was also conducted between the independent variables included in this regression (Sociability and Effortful Control). The bivariate correlation between these two variables was not significant $r(77) = .078, p = .492$, indicating independent variables. Furthermore, the recommended test of tolerance to detect multicollinearity ($1 - R^2$) was .92 for Model 1 and .87 for Model 2. A minimum tolerance level between .10 and .20 has been recommended in the literature, and higher tolerance levels are preferred. These tests demonstrated that the regression predicting Internalizing from Sociability, Effortful Control, and their interaction, did not have problems with collinearity or multicollinearity.

Table 18 represents the hierarchical regression model predicting Internalizing behaviors (SCBE) from the Sociability factor (STI), the Effortful Control composite created from the Inhibitory Control and Attentional Focusing scales (CBQ), and the interaction between the Sociability factor and Effortful Control. The main effect of the Sociability (STI) factor on Internalizing scores was significant $\beta = .25, t(65) = 2.04, p =$

.045. However, the main effect of Effortful Control (CBQ) on Internalizing scores was not significant $\beta = .13$, $t(65) = 1.07$, $p = .29$. The effect of the interaction term (Sociability x Effortful Control) was not significant, but was approaching significance $\beta = 1.98$, $t(65) = 1.88$, $p = .065$. The ΔR^2 was .05 when the interaction term was added in Model 2; the addition of the interaction term was approaching significance in predicting Internalizing scores. In other words, the addition of the interaction term explained an additional 5% of the variance in Internalizing scores when compared to the main effects model.

Model 1, which included the Sociability (STI) factor and Effortful Control composite (CBQ), did not explain a significant proportion of variance in Internalizing scores $R^2 = .08$, $F(2, 63) = 2.80$, $p = .069$, but was approaching significance. Model 2, which included the addition of an interaction term (Sociability x Effortful Control), also did not explain a significant proportion of variance in Internalizing scores $R^2 = .13$, $F(3, 62) = 3.12$, $p = .065$, but was approaching significance. The overall Model 1 was not statistically significant, but was approaching significance $F(2, 63) = 2.80$, $p = .069$; and the overall Model 2 was statistically significant $F(3, 62) = 3.12$, $p = .032$.

A simple slope analysis demonstrated that a significant slope existed for high levels of Effortful Control ($p = .013$); but not for low levels of Effortful Control ($p = .286$). Preschoolers who were rated high in Sociability and high in Effortful Control displayed the best behavioral adjustment (i.e. fewest Internalizing behaviors). Interestingly, preschoolers who were rated low in Sociability, and high in Effortful Control, displayed the most Internalizing behaviors. This subgroup of children was rated as being socially avoidant (i.e. low scores on Sociability), but also likely hypervigilant to

threat (i.e. high scores on the indices that make up Effortful Control – Attentional Focusing and Inhibitory Control). This analysis was instrumental in demonstrating that high Effortful Control is a resiliency factor only when paired with the high levels of Sociability. Children who were rated as having low Effortful Control, and low Sociability were rated as being better behaviorally adjusted than those rated high on Sociability. Children who struggle to regulate their attention and inhibitory control (i.e. effortful control) during social interactions are likely to have more behavioral adjustment difficulties (e.g. difficulty regulating their behaviors and attending to important social cues). More detailed information regarding this regression can be found in Appendix E, Tables 36-38.

Table 18

Hierarchical Regression Predicting Internalizing (SCBE) from Sociability (STI), Effortful Control (CBQ), and their interaction

Predictor				<u>Internalizing</u>				
	R^2	ΔR^2	p -value	B	$SE B$	β	t	p -value
<u>Model 1</u>								
Sociability	.08	.08	.07	3.25	1.59	.25*	2.04	.05
Effortful Control				1.19	1.12	.13	1.07	.29
<u>Model 2</u>								
Sociability	.13	.05	.07	-14.54	9.59	-1.11	-1.52	.14
Effortful Control				-11.23	6.71	-1.21	-1.68	.10
Sociability x Effortful Control				3.42	1.82	1.98	1.88	.07

* $p < .05$; ** $p < .01$ ³³ Model 1 was not statistically significant, but was approaching significance $F(2, 63) = 2.80, p = .069$; Model 2 was statistically significant $F(3, 62) = 3.12, p = .032$.

A hierarchical linear regression model was also used to test whether Effortful Control moderated the relationship between the Prefers Familiar/Routine (STI) factor and Internalizing (SCBE). In Model 1, the Prefers Familiar/Routine (STI) factor was entered as the independent variable, and Effortful Control (CBQ) was entered as the moderator variable $Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon_i$. In Model 2, the Prefers Familiar/Routine (STI) factor was entered as the independent variable, Effortful Control (CBQ) was entered as the moderator variable, and a product term (Prefers Familiar/Routine x Effortful Control) was entered as the interaction variable $Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 (X_1 * X_2) + \varepsilon_i$.

An assessment of collinearity, the degree to which two independent variables are correlated, was also conducted between the independent variables included in this regression (Prefers Familiar/Routine and Effortful Control). The bivariate correlation between these two variables was not significant $r(77) = -.14, p = .209$, indicating independent variables. Furthermore, the recommended test of tolerance to detect multicollinearity ($1 - R^2$) was .90 for Model 1 and .90 for Model 2. A minimum tolerance level between .10 and .20 has been recommended in the literature, and higher tolerance levels are preferred. These tests demonstrated that the regression predicting Internalizing from Prefers Familiar/Routine, Effortful Control, and their interaction, did not have problems with collinearity or multicollinearity.

Table 19 represents the hierarchical regression model predicting Internalizing behaviors (SCBE) from the Prefers Familiar/Routine factor (STI), the Effortful Control composite created from the Inhibitory Control and Attentional Focusing scales (CBQ), and the interaction between the Prefers Familiar/Routine factor and Effortful Control. The main effect of the Prefers Familiar/Routine (STI) factor on Internalizing scores was

significant $\beta = -.28$, $t(65) = -2.32$, $p = .024$. However, the main effect of the Effortful Control composite (CBQ) on Internalizing scores was not significant $\beta = .12$, $t(65) = .98$, $p = .333$. Furthermore, there was not a significant effect with the addition of the interaction term (Prefers Familiar/Routine x Effortful Control) on Internalizing scores $\beta = -.54$, $t(65) = -.65$, $p = .520$. The ΔR^2 was .01 when the interaction term was added in Model 2; the addition of the interaction term did not add to the predictive capacity in explaining Internalizing scores.

Model 1, which included the Prefers Familiar/Routine (STI) factor and Effortful Control composite (CBQ), explained a significant proportion of variance in Internalizing scores $R^2 = .10$, $F(2, 63) = 3.41$, $p = .039$. However, the inclusion of the interaction term (Prefers Familiar/Routine x Effortful Control) in Model 2 did not add to the explained variance in Internalizing scores $R^2 = .10$, $F(3, 62) = 2.39$, $p = .520$. The overall Model 1 was statistically significant $F(2, 63) = 3.41$, $p = .039$; however, the overall Model 2 was not statistically significant $F(3, 62) = 2.39$, $p = .077$. The inclusion of the interaction term did not significantly add to the predictive capacity in explaining the variance in Internalizing scores. More detailed information regarding this regression can be found in Appendix E, Tables 39-41.

Table 19

Hierarchical Regression Predicting Internalizing (SCBE) from Prefers Familiar/Routine (STI), Effortful Control (CBQ), and their interaction

Predictor	R^2	ΔR^2	p -value	Internalizing				
				B	$SE B$	β	t	p -value
<u>Model 1</u>								
Prefers Familiar/Routine	.10*	.10	.04	-3.85	1.66	-.28*	-2.32	.02
Effortful Control				1.08	1.11	.12	.98	.33
<u>Model 2</u>								
Prefers Familiar/Routine	.10	.01	.52	1.90	9.05	.14	.21	.83
Effortful Control				4.50	5.40	.49	.83	.41
Prefers Familiar/Routine x Effortful Control				-1.14	1.77	-.54	-.65	.52

* $p < .05$; ** $p < .01$ ⁴

⁴ Model 1 was statistically significant $F(2, 63) = 3.41, p = .039$; Model 2 was not statistically significant $F(3, 62) = 2.39, p = .077$

Table 20

Summary of Study Findings

Research Hypotheses	Predicted Relationships	Significant Findings
<p>1. It was hypothesized that the three identified Approach/Avoidance factors on the STI would correlate with specific scales on the CBQ based on underlying dimensions of reactivity and emotionality, and scales that measure similar constructs/phenomena.</p>	<p>A. The Prefers Familiar/Routine factor (STI) was predicted to positively correlate with the Low Intensity Pleasure, Fear, and Shyness scales (CBQ); and to negatively correlate with the Impulsivity scale (CBQ).</p>	<p>A. The Prefers Familiar/Routine factor (STI) was positively correlated with the Shyness scale (CBQ); and was negatively correlated with the Impulsivity scale (CBQ).</p>
	<p>B. The Sociability factor (STI) was predicted to positively correlate with the Approach/Positive Anticipation, Smiling & Laughter, High Intensity Pleasure, and Activity Level scales (CBQ); and to negatively correlate with the Shyness scale (CBQ).</p>	<p>B. The Sociability factor (STI) was positively correlated with the Smiling & Laughter, Activity Level, and Impulsivity scales (CBQ); and was negatively correlated with the Shyness scale (CBQ).</p>
	<p>C. The Risk Seeking factor (STI) was predicted to positively correlate with the Approach/Positive Anticipation, Impulsivity, Activity Level, and High Intensity Pleasure scales (CBQ); and to negatively correlate with the Inhibitory Control scale (CBQ).</p>	<p>C. The Risk Seeking factor (STI) was positively correlated with the High Intensity Pleasure, Impulsivity, and Activity Level scales (CBQ); and was negatively correlated with the Sadness scale (CBQ).</p>

Summary of Study Findings

Research Hypotheses	Predicted Relationships	Significant Findings
<p>2. It was hypothesized that emotion understanding and internalizing are non-temperament factors that are correlated with temperamental approach/avoidance. Specifically, the Prefers Familiar/Routine factor on the STI was hypothesized to correlate positively with Internalizing behaviors; and the Sociability factor on the STI was hypothesized to correlate negatively with Internalizing behaviors. In addition, the Prefers Familiar/Routine factor on the STI was hypothesized to correlate negatively with Emotion Understanding; and the Sociability factor on the STI was hypothesized to correlate positively with Emotion Understanding.</p>	<p>A. The Prefers Familiar/Routine factor (STI) was predicted to negatively correlate with Internalizing (SCBE); and the Sociability factor (STI) was predicted to positively correlate with Internalizing (SCBE). Note: High T-scores on the SCBE Internalizing scale signify better adjustment; and low T-scores signify internalizing problems.</p> <p>B. The Prefers Familiar/Routine factor (STI) was predicted to negatively correlate with the ECT-Situations and ECT-Behaviors measures (ECT); and the Sociability factor (STI) was predicted to positively correlate with the ECT-Situations and ECT-Behaviors measures (ECT).</p>	<p>A. The Prefers Familiar/Routine factor (STI) was negatively correlated with Internalizing (SCBE); and the Sociability factor (STI) was positively correlated with Internalizing (SCBE).</p> <p>B. The Prefers Familiar/Routine factor (STI) was negatively correlated with the ECT-Situations measure. The Sociability factor (STI) was not significantly correlated with any of the ECT measures.</p>

Summary of Study Findings

Research Hypotheses	Predicted Relationships	Significant Findings
<p>3. It was hypothesized that Effortful Control would moderate the relationship between the Prefers Familiar/Routine factor on the STI and Emotion Understanding on the ECT. Specifically, children who were rated high on the Prefers Familiar/Routine factor, and rated low on Effortful Control, were predicted to have the most difficulty with Emotion Understanding.</p>	<p>A. Effortful Control (CBQ) was predicted to moderate the relationship between the Prefers Familiar/Routine factor (STI) and ECT-Situations (ECT), such that children rated high on the Prefers Familiar/Routine factor (STI), and low on Effortful Control (CBQ), would have low scores on ECT-Situations (ECT).</p>	<ol style="list-style-type: none"> 1. The Prefers Familiar/Routine factor (STI) had a significant main effect on ECT-Situations scores, such that children rated high on Prefers Familiar/Routine earned low ECT-Situations scores. 2. The Effortful Control composite (CBQ) had a significant main effect on ECT-Situations scores, such that children rated high on Effortful Control earned high ECT-Situations scores. 3. Model 1, including the Prefers Familiar/Routine factor (STI) and Effortful Control composite (CBQ), explained a significant proportion of the variance (19%) in ECT-Situations scores. However, the moderation model did not contribute additional variance beyond the main effects. 4. Both overall models were statistically significant.

Summary of Study Findings

Research Hypotheses	Predicted Relationships	Significant Findings
<p>4. It was hypothesized that Effortful Control would moderate the relationship between the Sociability factor on the STI and Internalizing on the SCBE. Specifically, children who were rated low on Sociability, and low on Effortful Control, were predicted to have the most Internalizing behaviors. It was also hypothesized that Effortful Control would moderate the relationship between the Prefers Familiar/Routine factor on the STI and Internalizing on the SCBE. Specifically, children who were rated high on the Prefers Familiar/Routine factor, and low on Effortful Control, were predicted to have the most Internalizing behaviors.</p>	<p>A. Effortful Control (CBQ) was predicted to moderate the relationship between the Sociability factor (STI) and Internalizing (SCBE) such that children rated lower on Sociability, and lower on Effortful Control (CBQ), would have the most Internalizing behaviors (SCBE).</p>	<ol style="list-style-type: none"> 1. The Sociability factor (STI) had a significant main effect on Internalizing (SCBE) scores, such that higher Sociability was related to better behavioral adjustment. 2. The interaction term (Sociability x Effortful Control) did not have a significant effect on Internalizing (SCBE) scores, but was approaching significance. Children rated higher on Sociability and higher on Effortful Control had better behavioral adjustment. 3. Model 1, including the Sociability factor (STI) and Effortful Control composite (CBQ), did not explain a significant proportion of variance in Internalizing (SCBE) scores, but was approaching significance.

Summary of Study Findings

Research Hypotheses	Predicted Relationships	Significant Findings
4. Continued	<p>B. Effortful Control (CBQ) was predicted to moderate the relationship between the Prefers Familiar/Routine factor (STI) and Internalizing (SCBE) such that children rated high on Prefers Familiar/Routine (STI), and low on Effortful Control (CBQ), would have the most Internalizing behaviors (SCBE).</p>	<p>4. Model 2, including the interaction term (Sociability x Effortful Control), did not explain a significant proportion of variance in Internalizing (SCBE) scores, but was approaching significance.</p> <p>5. The overall Model 1 was not significant, but was approaching significance; and the overall Model 2 was statistically significant.</p> <p>1. The Prefers Familiar/Routine factor (STI) had a significant main effect on Internalizing (SCBE) scores, such that children rated higher on Prefers Familiar/Routine experienced more Internalizing behaviors.</p> <p>2. Model 1, including the Prefers Familiar/Routine factor (STI) and Effortful Control composite (CBQ), explained a significant proportion of variance (10%) in Internalizing (SCBE) scores.</p> <p>3. The overall Model 1 was statistically significant.</p>

Chapter 5: Discussion

Internalizing disorders are among the most frequently diagnosed behavioral/psychological disorders in childhood (Crawford, Schrock, & Woodruff-Borden, 2011). The goal of the present study was to examine how the approach/avoidance dimension of temperament, and emotion understanding, contribute to the development of internalizing problems in preschool. One explanation for the early observation of avoidant behavior is the combination of the temperament traits high reactivity and negative emotionality. For example, infants who were rated high on negative emotionality and reactivity showed fearfulness to novel events and the development of behavioral inhibition in toddlerhood. In contrast, children rated low in reactivity, and high in positive emotionality, showed low levels of fear and high sociability (Hane et al., 2008). In the first section of this study, two measures of temperament (the STI and the CBQ) were compared based on underlying dimensions of emotionality and reactivity. This comparison demonstrated the reliability of a newer measure of temperament, the STI, with a well-validated measure of temperament, the CBQ. In addition, the use of the STI provided a new way of conceptualizing the Approach/Avoidance dimension of temperament as three unique components (Prefers Familiar/Routine, Sociability, Risk Seeking); the widely used CBQ does not separate this dimension of temperament into these unique facets. Furthermore, this study highlighted the role of particular temperament vulnerability factors, including high reactivity and negative emotionality, when examining the approach/avoidance dimension of temperament and its connection to overall adjustment.

This study also examined resiliency factors that serve to protect children from developing adjustment problems. Effortful control has been cited in the literature as a resiliency temperament factor. It acts as a regulatory aspect of temperament and includes the ability to inhibit a dominant response in favor of a more desirable response (Eisenberg, Haugen, Spinrad, Hofer, Chassin, Zhou, Kupfer, Smith, Valiente, & Liew, 2010). In the current study, effortful control was viewed as a protective factor for children who were more likely to have difficulty with emotion understanding (i.e. children who are behaviorally inhibited, and socially isolated), and more vulnerable to develop internalizing problems (i.e. children with high avoidance, reactivity, and negative emotionality).

The last section of this study examined the relationships between temperament vulnerability factors (avoidance, high reactivity, and negative emotionality), effortful control as a protective factor, and overall adjustment. This goal was achieved by examining the influence of temperament on preschooler emotion understanding and internalizing behaviors. Effortful control was conceptualized as a moderator of the relationship between sociability and overall adjustment (i.e. and internalizing).

Research Hypothesis 1

The first set of research hypotheses examined the correlations between the three Approach/Avoidance factors on the STI (Prefers Familiar/Routine, Sociability, and Risk Seeking) and specific scales on the CBQ based on: underlying dimensions of reactivity and emotionality. These analyses provided evidence for the validity of using the STI as an alternative, in-depth, measure of temperament compared to the CBQ; and also highlighted particular temperament vulnerability factors.

Prefers familiar/routine. The Prefers Familiar/Routine factor on the STI includes items that assesses the degree to which children wish to depart from their routine; prefer routine versus novel situations; wish to engage in familiar activities; respond to requests to attempt new activities; and their tendency to seek out new activities. The STI Prefers Familiar/Routine factor was hypothesized to positively correlate with the CBQ scales of Fear, Shyness, and Low Intensity Pleasure; and to negatively correlate with the Impulsivity scale based on underlying dimensions of high reactivity and negative emotionality. Highly reactive children are more sensitive to sensory stimuli in their environment, including stress-inducing stimuli, which can lead to negative developmental outcomes (Evans, Nelson, & Porter, 2012). Negative emotionality is one aspect of reactivity that involves a predisposition to experience negative emotions, including the intensity and duration of those emotions. Greater negative emotionality is often related to a variety of behavioral problems (Moran, Lengua, & Zalewski, 2013).

Relationships hypothesized and found. Two of the hypothesized relationships between the CBQ scales and the Prefers Familiar/Routine STI factor were statistically significant. In line with the hypotheses, the Shyness scale was positively correlated with the Prefers Familiar/Routine factor, and the Impulsivity scale was negatively correlated with the Prefers Familiar/Routine factor.

Shyness scale. Shyness is typically characterized by social withdrawal in the presence of peers. These behaviors may stem from social fear/anxiety or a preference for being alone. Children who are socially withdrawn are at-risk for developing adjustment difficulties including internalizing behaviors (anxiety, depression, low self-esteem), peer

difficulties, and academic difficulties (Rubin, Coplan, & Bowker, 2009). The Shyness scale on the CBQ assesses a child's slow or inhibited approach in social situations involving novelty or uncertainty. As predicted, the Prefers Familiar/Routine factor on the STI was significantly positively correlated with the Shyness scale on the CBQ. Children who were rated as having a preference for routine and familiar activities were also viewed as having a slow-to-warm-up, or inhibited, approach in social settings. These children exhibited an underlying dimension of high reactivity, or sensory sensitivity, in unfamiliar social situations. Qualitative parent examples of shyness on the STI included children hanging back and observing people in new surroundings; being slow-to-warm up to new people; not approaching new people in social situations; not initiating socialization with others; and staying close to parents during social situations (Gifford, 2012).

Impulsivity scale. Impulsivity generally refers to a range of behaviors that occur without foresight, or thought of future consequences. It is associated with low inhibitory control and can be linked with a variety of developmental problems. It plays a role in both normal development and pathological outcomes (Evenden, 1999). Children gradually develop more self-control after they turn 3 years old, which makes preschool an opportune time to measure this construct of temperament. The Impulsivity scale on the CBQ measures the degree of quick approach of novel situations, being the first to try new activities, and rushing into new activities without thinking about them ahead of time.

As hypothesized, the Impulsivity scale on the CBQ was highly negatively correlated with the Prefers Familiar/Routine factor on the STI. In addition, the Impulsivity and Inhibitory Control scales on the CBQ were significantly negatively

correlated. This further illustrated that this group of children was not able to suppress inappropriate approach responses when given parent direction or in novel/uncertain situations. Not surprisingly, children in the current study who were rated as preferring routine activities were not likely to rush into new situations or activities, or to do things without thinking through them first. By definition, this group of children is non-impulsive, and does not rush into novel situations. Parents in the current study described their children's level of inhibitory control, and/or lack of impulsivity, through the qualitative examples on the STI. Examples of these temperament constructs included children being creatures of habit; and needing explanations and advance warning of upcoming changes to routines (Gifford, 2012). This group of children is not likely to depart from familiar routines without planning and preparation.

Relationships hypothesized and not found. Two of the hypothesized relationships between the CBQ scales and the Prefers Familiar/Routine STI factor were not statistically significant. Contrary to the hypotheses, the Low Intensity Pleasure and Fear scales were not significantly correlated with the Prefers Familiar/Routine factor.

Low intensity pleasure scale. The Low Intensity Pleasure scale was hypothesized to positively correlate with the Prefers Familiar/Routine factor, but was not significant. Children who experience high reactivity tend to attain their optimal level of arousal with low levels of stimulation. They can show stronger and more variable emotional reactions to stimuli (Derryberry & Rothbart, 1998). The Low Intensity Pleasure scale on the CBQ assesses the amount of pleasure or enjoyment related to situations involving low stimulus intensity and low novelty. The Prefers Familiar/Routine factor on the STI was not significantly correlated with the Low Intensity Pleasure scale on the CBQ. Contrary to

prediction, children who were rated as having a preference for routine and familiar activities were not highly reactive to stimulus intensity in their environment. One explanation for this surprising finding is that children who were rated high on the Prefers Familiar/Routine factor fell in a range of mild to extreme dislike of changes in routine; however, the majority of these children were rated as having a “mild dislike of changes in routine.” If more children were rated as having an “extreme dislike for changes in routine”, the Prefers Familiar/Routine factor and the Low Intensity Pleasure scale may have been more strongly correlated. In line with this finding, the Low Intensity Pleasure and Shyness scales on the CBQ were not significantly correlated either.

When parents rated their children on the Prefers Familiar/Routine factor they tended to choose “mild dislike for changes in routine/expectations.” Some of the parent examples of children who fell in this category included that the child was a creature of habit; having specific times in which the child was willing to try new things outside of their normal routine; participating in new activities, but not seeking them out on his/her own; reactions depending on how the parents framed the new situation; and being comfortable departing from routine when the new activity was particularly interesting (Gifford, 2012). These reactions were characteristic of preferences, but not necessarily high reactivity and/or avoidance.

Fear scale. Fear is one of the commonly studied aspects of negative emotionality. Fear reactivity is a propensity to experience negative affect, inhibition, or withdrawal in response to novel and/or challenging situations, signals of punishment, or aversive stimuli. Studies examining the direct effect between fear and adjustment have linked higher fear levels with more internalizing behaviors (Moran, Lengua, & Zalewski,

2013). The Fear scale on the CBQ measures the amount of negative affect, unease, worry or nervousness, related to anticipated pain or distress and/or potentially threatening situations.

Contrary to prediction, the Fear scale on the CBQ was not significantly correlated with the Prefers Familiar/Routine factor on the STI. Children from the current study who preferred to stick with known routines, and engage in familiar activities, did not also have an accompanying level of fear associated with departing from the familiar/routine. However, the Shyness and Fear scales on the CBQ were significantly positively correlated, suggesting that children from the current study who withdraw in social situations have an accompanying level of fear associated with these situations. This subgroup of children is likely to be more at-risk for developing adjustment problems (i.e. difficulty with emotion understanding and internalizing behaviors).

Parent qualitative examples of children who fell in the high end of the Prefers Familiar/Routine continuum tended to illustrate the constructs of high reactivity and negative emotionality, more than the concept of true fear. Parents shared the following qualitative examples of high reactivity and negative emotionality on the STI: changing the driving route to school caused a preschooler to cry for 15 minutes; child engaged in verbal protests because of changes in routine; child was fearful to start preschool; and the child felt stressed when there was a substitute teacher in preschool (Gifford, 2012). These examples illustrated that fear was one of many reasons for preschoolers to prefer the routine and familiar, and is more generally related to negative reactivity.

Sociability. The Sociability factor on the STI includes items that assess the degree to which children approach familiar adults in unfamiliar settings; their response to

new children in familiar settings; how lively their behaviors are in a group setting; their preference for being around others versus being alone; and their approach tendencies with familiar adults. The STI Sociability factor was hypothesized to positively correlate with the High Intensity Pleasure, Smiling & Laughter, Approach/Positive Anticipation, and Activity Level scales on the CBQ; and to negatively correlate with the Shyness scale on the CBQ based on underlying aspects of low reactivity and positive emotionality.

Emotional reactivity refers to the degree to which children experience emotions, the range of stimuli to which children respond, the intensity of their response, and the duration of their arousal to stimuli before returning to a baseline level (Shapiro & Steinberg, 2013). Children with low reactivity would therefore have low intensity responses and low arousal levels to sensory stimuli. Children who have low levels of reactivity are also perceived as less shy and more sociable than other children (Hardway, Kagan, Snidman, & Pincus, 2013). Positive emotionality involves children's individual differences in expressing cheerfulness and enthusiasm, their willingness to engage with their environment, and their sociability. It is often associated with the temperament dimensions of positive anticipation, smiling/laughter, high intensity pleasure, and activity levels (Ghassabian, Szekely, Herba, Jaddoe, Hofman, Oldehinkel, Verhulst, & Tiemeier, 2014).

Relationships hypothesized and found. Three of the hypothesized relationships between the CBQ scales and the Sociability STI factor were statistically significant. In line with the hypotheses, the Smiling & Laughter and Activity Level scales were positively correlated with the Sociability factor; and the Shyness scale was negatively correlated with the Sociability factor.

Smiling & laughter scale. Previous studies have demonstrated that maternal reports of children's comfort in social situations were significantly positively correlated with the number of smiles those children displayed (Hardway, et al., 2013). The Smiling & Laughter scale on the CBQ assesses the amount of positive affect in response to changes in intensity, rate, complexity, and social interactions. As predicted, a statistically significant positive relationship was found between the Sociability factor on the STI and the Smiling & Laughter scale on the CBQ. Children from the current study who were rated as more sociable also displayed more positive affect in the form of smiling and laughter. Parent qualitative examples of this dimension of positive affect included giving new friends hugs and smiling easily; waving and smiling at new people they meet; and being social with new people in familiar surroundings such as school and the public library (Gifford, 2012). This group of children easily engaged in social interactions with both familiar and new people in their environment; and their behaviors were characterized by positive affect and low reactivity.

Activity level scale. Activity level refers to a child's tendency to exert gross motor activity in response to environmental stimuli. It is linked with high reactivity, and may be expressed as enthusiasm or as poor self-regulation (Rudasill, Gallagher, & White, 2010). The Activity Level scale on the CBQ measures the level of gross motor activity including rate and extent of locomotion during social interactions such as games and sports. As predicted, the Activity Level scale on the CBQ was significantly positively correlated with the Sociability factor on the STI. Children who were rated as more sociable and outgoing in the current study were also more physically active and full of energy. Parent qualitative examples of this dimension on the STI included acting as a

“tour guide” and showing new visitors around the home; running up to new people to introduce themselves and offer hugs; and running up to make new friends at the park (Gifford, 2012). This group of children was typically active and initiated social contact in new and familiar settings.

Shyness scale. As stated above, shyness is typically characterized by social withdrawal in the presence of peers (Rubin, Coplan, & Bowker, 2009). The Shyness scale on the CBQ assesses a child’s slow or inhibited approach in situations involving novelty or uncertainty. In line with the hypotheses, the Shyness scale on the CBQ was significantly negatively correlated with the Sociability factor on the STI. Not surprisingly, children in the current study who enjoyed engaging with others in their environment were not rated as withdrawn or shy. Qualitative parent examples of this eager approach in social situations included always being able to find a new friend when visiting the playground; being open and willing to bring new kids into his/her circle of friends; easily joining conversations with other kids; being comfortable initiating socialization with new kids; and being immediately relaxed around new children (Gifford, 2012).

Relationship not hypothesized and found. One of the statistically significant relationships found between the CBQ scales and the Sociability STI factor was not part of the original hypotheses. The Impulsivity scale was significantly positively correlated with the Sociability factor.

Impulsivity scale. As stated above, impulsivity generally refers to a range of behaviors that occur without foresight, or thought of future consequences (Evenden, 1999). The Impulsivity scale on the CBQ measures the speed of response initiation in

novel situations, being the first to try new activities, and rushing into new activities without thinking about them ahead of time. The Impulsivity scale on the CBQ was highly positively correlated with the Sociability factor on the STI. Interestingly, the current sample of children who were rated as outgoing and sociable, were also more likely to act without thinking of potential consequences or outcomes. Parent examples of impulsive social approach included quick approach of unfamiliar children and inviting them to play; approaching a new child on the metro and sitting with them; approaching new children regardless of their age; and immediately showing new visitors in the home their toys (Gifford, 2012). These behaviors are characteristic of low reactivity and positive emotionality. Furthermore, as children get older they may develop better effortful control, which will allow them to moderate their impulsivity levels.

Relationships hypothesized and not found. Two of the hypothesized relationships between the CBQ scales and the Sociability STI factor were not statistically significant. Contrary to prediction, the High Intensity Pleasure and Approach/Positive Anticipation scales were not significantly correlated with the Sociability factor.

High intensity pleasure scale. The temperament dimension of High Intensity Pleasure involves children's tendency to seek out and have positive affect with high stimulus, exciting, novel, and diverse experiences and stimuli. It is part of the sensation-seeking construct and is correlated with risk taking behaviors (Rothbart, Ahadi, & Evans, 2000). The High Intensity Pleasure scale on the CBQ measures the pleasure or enjoyment related to situations involving high stimulus intensity, rate, complexity, novelty, and during socialization with others. Contrary to prediction, a statistically significant relationship was not found between the Sociability factor on the STI and the

High Intensity Pleasure scale on the CBQ. Furthermore, the Low Intensity Pleasure scale on the CBQ was not significantly correlated to the Sociability factor either. Sociable children from the current study appeared to prefer a moderate level of stimulus intensity and novelty, rather than either extreme.

Parents were able to provide qualitative examples of the level of intensity children preferred in new social situations via items on the STI. For example, parents shared that children were interested in engaging with new people in a familiar context (e.g. doctor's office) at a moderate level; were more likely to engage socially with new people in his/her familiar classroom; did not initiate the conversation, but were willing to engage with new people who visit his/her home; and were slow-to-warm up before engaging with new people in a familiar setting (Gifford, 2012).

Approach/positive anticipation scale. Approach/positive anticipation falls within the surgency aspect of temperament. Surgency involves sensitivity to rewards and relief from punishment. It is associated with desire, positive emotionality, sociability, novelty seeking, and high activity levels (Allan, Lonigan, & Wilson, 2013). The Approach/Positive Anticipation scale on the CBQ measures the amount of excitement and positive anticipation for expected pleasurable activities including socialization with others. Although not statistically significant with the current study sample, the relationship between the Sociability factor and the Approach/Positive Anticipation scale was approaching statistical significance. Children who were considered sociable in the current study were also more likely to become excited and positively anticipate pleasurable activities. Also in line with previous research findings, the

Approach/Positive Anticipation and Smiling & Laughter scales on the CBQ were significantly positively correlated.

Parents were able to provide qualitative examples of approaching and positive anticipation tendencies through examples on the STI. Some examples of preschooler behaviors that fell into this category included being very outgoing with strangers; giving hugs to new people; being very talkative and social with new visitors to the home; happily inviting new friends to play; and using common interests to initiate contact with new friends (Gifford, 2012).

Risk Seeking. The Risk Seeking factor on the STI includes items that assess the degree to which a child would approach a pleasant situation/fun activity after being told they could get hurt; their reaction to risky situations; and their tendency to seek out adventure, new tasks, and challenges. The Risk Seeking factor on the STI was hypothesized to positively correlate with the High Intensity Pleasure, Impulsivity, Approach/Positive Anticipation, and Activity Level scales on the CBQ; and to negatively correlate with the Inhibitory Control scale on the CBQ based on underlying dimensions of low reactivity and both positive and negative emotionality. As stated above, children who have low levels of reactivity also have low intensity responses, low arousal levels, and are more sociable. Positive emotionality is related to children's positive mood and high engagement with their environment; and negative emotionality is associated with fearfulness, sadness, vulnerability, and anxiety (Ghassabian et al., 2014).

Relationships hypothesized and found. Three of the hypothesized relationships between the CBQ scales and the Risk Seeking STI factor were statistically significant. In

line with hypotheses, the High Intensity Pleasure, Impulsivity, and Activity Level scales were all significantly positively correlated with the Risk Seeking factor.

High intensity pleasure scale. The High Intensity Pleasure scale was hypothesized to positively correlate with the Risk Seeking factor because children with these temperament qualities tend to seek out exciting stimuli and situations. The High Intensity Pleasure scale measures the amount of pleasure or enjoyment related to situations involving high stimulus intensity, adventure, risk, and novelty. As predicted, a significant positive correlation was found between the Risk Seeking factor and the High Intensity Pleasure scale. Children in the current study who enjoyed high stimulus intensity also sought out risky/adventurous situations. Parent examples of this temperament dimension included unrestrained approach of situations regardless of the potential danger; enthusiastically attempting to rock climb, jumping on trampolines, and going bike riding; and not being deterred from participating in new activities when being warned of the risk level (Gifford, 2012).

Activity level scale. As stated above, activity level refers to a child's tendency to exert gross motor activity in response to environmental stimuli (Rudasill, Gallagher, & White, 2010). The Activity Level scale on the CBQ measures the level of gross motor activity including approach speed, preference for games, and energetically approaching. As predicted, the Activity Level scale on the CBQ was significantly positively correlated with the Risk Seeking factor on the STI. Children in the current study who had high levels of active/energetic approach were also more likely to approach risky and/or dangerous situations and activities. Qualitative parent examples of active, energetic, and risky approach on the STI included energetically playing on a "moon bounce" and

trampoline; jumping off of a bench in the kitchen, getting hurt, and continuing to repeat the behavior; and not being deterred from participating after getting injured during sports games (Gifford, 2012).

Impulsivity scale. Impulsivity generally refers to a range of behaviors that occur without foresight, or thought of future consequences (Evenden, 1999). The Impulsivity scale on the CBQ measures the degree of quick approach of novel situations, being the first to try new activities, and rushing into/approaching new activities without thinking about them ahead of time. As predicted, the Impulsivity scale on the CBQ was significantly positively correlated with the Risk Seeking factor on the STI. Not surprisingly, children in the current study who were categorized as acting without thinking were also more likely to approach risky and/or potentially dangerous situations. Parents were able to provide qualitative examples of this impulsive/risky form of approach on the STI. Examples of these temperament qualities included acting invincible when participating in potentially dangerous activities; jumping into the shallow end of the swimming pool despite parental reminders not to; requiring parental regulation of participation in different risky activities such as skateboarding; unrestrained approach of risky activities regardless of their danger level; and having no sense of fear (Gifford, 2012).

Relationship not hypothesized and found. One statistically significant relationship was found between the CBQ scales and the Risk Seeking STI factor that was not part of the original hypotheses. The Sadness scale was significantly negatively correlated with the Risk Seeking factor.

Sadness scale. Sadness falls into the continuum of temperamental negative emotionality. It can include irritability, negative mood, unsoothability, and high intensity negative reactions (Paulussen-Hoogeboom, Stams, Hermanns, & Peetsma, 2008). The Sadness scale on the CBQ measures the amount of negative affect and lowered mood and energy related to exposure to suffering, disappointment, and object loss. Although not included in the original hypothesis, the Sadness scale on the CBQ was significantly negatively correlated with the Risk Seeking factor on the STI (Table 24, Appendix C). Children in the current study who more willingly approached novel and potentially risky situations experienced less negative emotionality or sadness. Similarly, the Risk Seeking (STI) factor was not significantly correlated with Internalizing (SCBE).

Positive emotionality, or a lack of sadness, was evident through parent qualitative examples on Risk Seeking STI items. For example, children rated high in Risk Seeking experienced positive emotions during risky activities such as rock climbing, bike riding, and swimming. Many parents described their children as “loving” these types of activities. Some children were described as using safety precautions and good judgment before attempting a risky activity, but also thoroughly enjoying the activity (Gifford, 2012). Overall, positive emotionality was prevalent in parent examples of Risk Seeking approach.

Relationships hypothesized and not found. Two of the hypothesized relationships between the CBQ scales and the Risk Seeking STI factor were not statistically significant. Contrary to prediction, the Inhibitory Control (low) and Approach/Positive Anticipation scales were not significantly correlated with the Risk Seeking factor.

Inhibitory control scale. Inhibitory control is part of children's regulatory processes and consists of the ability to inhibit, or override, a dominant response in favor of a more acceptable response. Slow developing or low levels of inhibitory control can make it difficult for children to display controlled and appropriate responses (Beijers, Riksen-Walraven, Putnam, de Jong, & de Weerth, 2013). The Inhibitory Control scale on the CBQ measures the capacity to plan and/or suppress inappropriate responses under instructions or in novel or uncertain situations. A negative correlation was predicted between the Inhibitory Control scale and the Risk Seeking factor; however, a significant relationship was not found between the two. The majority of children in the current study who sought out adventurous and exciting situations were able to inhibit inappropriate responses when necessary.

Parents provided qualitative examples of their children demonstrating inhibitory control in risky situations via STI items. For example, a large group of children were categorized as often approaching risky situations after putting safety measures into place first (e.g. wearing a helmet before skateboarding or bike riding). Another group of children benefitted from their parents regulating their level of participation in risky situations (i.e. not allowing the child to participate in potentially risky activities). Then, other children participated in activities after they assessed particular risk levels involved, and/or observed other children doing the activity first (Gifford, 2012). Either due to self-regulation or parent-regulation, children in the current study were able to override dominant responses for more favorable/safe behaviors when participating in potentially risky activities.

Approach/positive anticipation scale. As stated above, approach/positive anticipation is associated with the surgency aspect of temperament. The Approach/Positive Anticipation scale on the CBQ measures the amount of excitement (including getting worked up and having a hard time sitting still) and positive anticipation for expected pleasurable activities. Contrary to prediction, a significant relationship was not found between the Risk Seeking factor and the Approach/Positive Anticipation scale. Although children in the current study enjoyed exciting and adventurous activities, they did not have high levels of surgency.

Many of the parent examples of approaching potentially risky situations involved putting safety measures into place prior to the approach. For example, children often participated in bike riding, rock climbing, and skateboarding after they put on helmets and protective gear. While their affect was positive during their participation of these activities, parents didn't give examples of children getting worked up by anticipating these activities (Gifford, 2012). However, the Impulsivity and Approach/Positive Anticipation CBQ scales were significantly positively correlated in the current study. This subgroup of children would be more likely to get worked up and have a hard time sitting still when expecting pleasurable and/or exciting activities.

Research Hypothesis 2

The second set of research hypotheses examined the relationships between the Approach/Avoidance dimension of temperament and non-temperament aspects related to overall adjustment (i.e. emotion understanding and internalizing behaviors). More specifically, correlations between the three Approach/Avoidance factors on the STI (Prefers Familiar/Routine, Sociability, and Risk Seeking) and the three Emotion

Understanding measures on the ECT (ECT-ID, ECT-Situations, and ECT-Behaviors) were examined. In addition, correlations between the three Approach/Avoidance STI factors and Internalizing on the SCBE were examined.

Emotion understanding. Emotion understanding can be defined as children's ability to recognize and label their own and others' emotions, tie those emotions to situations, and understand the causes of those emotions (Blankson et al., 2013). Children with well-developed emotion understanding realize that emotions give important information about how to react in social situations. Furthermore, impairments in emotion understanding have been linked to higher levels of internalizing behaviors such as anxiety and depression (Rieffe & DeRooij, 2012).

Previous research has demonstrated that anxious, more avoidant, children are proficient in recognizing basic emotions, or emotion identification (Lee, Dupuis, Jones, Guberman, Herbert, & Manassis, 2013). In line with this research, no hypotheses were made regarding avoidant children's emotion identification in the current study.

Relationship hypothesized and found. One of the hypothesized relationships between the ECT measures and STI factors was statistically significant. In line with the hypothesis, the Prefers Familiar/Routine STI factor was significantly negatively correlated with the ECT-Situations measure. The ECT-Situations measure includes 15 vignettes in which the preschooler is read a hypothetical emotion-evoking situation. For example, the character in the vignette is promised that he/she can go to the fair, and when it is time to go, his/her parents say that he/she can't attend. The preschooler has to then identify if the character would feel happy, sad, mad, scared, or no feeling. Children who were rated higher on preferring familiar and routine activities, children who could be

conceptualized as more avoidant, were less accurate in identifying emotions in these hypothetical vignettes. The higher they were rated on the Prefers Familiar/Routine factor the less accurate emotion understanding they displayed on the ECT-Situations measure. Based on previous research, this subgroup of children is likely to have more difficulty in social interactions, and is at a higher risk of developing internalizing problems such as depression and anxiety.

Relationships hypothesized and not found. Three of the hypothesized relationships between the ECT measures and STI factors were not statistically significant. Contrary to prediction, there was no significant relationship between the Sociability STI factor and the ECT-Situations and ECT-Behaviors measures; or between the Prefers Familiar/Routine STI factor and the ECT-Behaviors measure. In other words, children's sociability did not have a significant effect on the accuracy of their emotion understanding during tasks that assessed basic emotion identification, emotions in hypothetical situations, or emotions portrayed by specific behaviors. In addition, children's preferences for engaging in routine and familiar activities did not influence their ability to identify basic emotions or understand emotions portrayed by behavioral descriptions.

Internalizing. The term internalizing problems refers to a broad array of social and emotional symptoms that tend to co-occur, including anxiety, somatic (physical) complaints, depression, and social inhibition (Olson & Rosenblum, 1998). Internalizing disorders are among the most frequently diagnosed and chronic childhood problems (Crawford et al., 2011). Due to the prevalence of early appearing internalizing problems in preschool, it is important to target risk factors. Child risk factors that have been linked

with the development of internalizing problems include high levels of negative emotionality/affect, high reactivity, and low inhibitory control.

Relationships hypothesized and found. Both of the hypothesized relationships between the STI factors and the Internalizing scale on the SCBE were statistically significant. In line with hypotheses, the Prefers Familiar/Routine factor was significantly negatively correlated with the Internalizing scale, and the Sociability factor was significantly positively correlated with the Internalizing scale. It is important to reiterate that higher T-scores on the Internalizing scale represent better adjustment, and lower T-scores signify more internalizing behaviors.

The Internalizing scale on the SCBE summarizes four of the negative poles of the basic scales (depressive, anxious, isolated, and dependent). Children rated high on the depressive scale may be described as difficult to console when they cry; tired; and sad, unhappy, or depressed. Children rated high on the anxious scale could be described as worried; timid/afraid (avoiding new situations); and inhibited or uneasy in a group setting. Children rated high on the isolated scale might be described as inactive or preferring to watch others play; not responsive to peer's invitations to play; and going unnoticed in a group setting. Children rated high on the dependent scale may be described as needing the teacher's assistance/presence to function well in class; asking for help when it is unnecessary; and being clingy with the teacher in novel situations (LaFreniere & Dumas, 2003).

As predicted, the Prefers Familiar/Routine factor was significantly negatively correlated with the Internalizing scale. In other words, children in the current study who preferred familiar and routine activities were rated as having more internalizing

problems. This group of children is generally described as anxious and/or fearful, and tends to withdraw from social situations. They may often appear depressed and are socially isolated; they also can appear unhappy and show little interest in the activities of their peers. Children in this group often have poor self-concepts and show high levels of immaturity, seeking adult attention when it is not required, and giving up easily when others would persist (LaFreniere & Dumas, 2003).

Parent qualitative examples of these internalizing behaviors on high ratings of the Prefers Familiar/Routine STI factor included having difficulty in school when the routine was changed; protesting when the routine was changed; crying when the routine was changed; sitting back and observing others in the environment; and being stressed when there was a substitute in preschool (Gifford, 2012).

Also as predicted, the Sociability factor was significantly positively correlated with the Internalizing scale. In other words, children in the current study who were rated as being more sociable and outgoing were rated as being better behaviorally adjusted, and having fewer internalizing behaviors. Children who earned higher T-scores on the SCBE Internalizing scale are described as having desirable levels of adjustment and fewer internalizing problems (LaFreniere & Dumas, 2003). Parent qualitative examples of these well-adjusted behaviors on high ratings of the Sociability STI factor included being friendly and outgoing with new friends; being comfortable with having a substitute preschool teacher; easily joining conversations with peers; and finding common interests with friends during play (Gifford, 2012).

Research Hypothesis 3

It was anticipated that the Prefers Familiar/Routine STI factor would be negatively correlated with Emotion Understanding, and this relationship was confirmed in Research Hypothesis 2. It was also hypothesized that Effortful Control would moderate this relationship so that the risk of having difficulty with Emotion Understanding is greater for those rated high on the Prefers Familiar/Routine factor and low on Effortful Control.

Main effects. Both the Prefers Familiar/Routine (STI) factor and the Effortful Control (CBQ) composite, had significant main effects. In other words, each of these variables significantly predicted ECT-Situations scores when controlling for the effects of the other variable. For example, children who were rated high on the Prefers Familiar/Routine (STI) factor earned lower (less accurate) scores on the ECT-Situations measure, when controlling for Effortful Control. Similarly, children who were rated high on Effortful Control (CBQ), earned higher (more accurate) scores on the ECT-Situations measure, when controlling for Prefers Familiar/Routine. Furthermore, the model that included these two variables significantly predicted 19% of the variance in children's scores on the ECT-Situations measure, which demonstrates the importance of both temperament attributes in the development of accurate emotion understanding in preschool.

Non-significant interaction effect. The addition of the moderation term (Prefers Familiar/Routine x Effortful Control) did not contribute significantly to the predictive value of ECT-Situations scores. In other words, the Prefers Familiar/Routine and Effortful Control temperament variables each uniquely contributed to children's emotion

understanding for hypothetical emotion-evoking situations (ECT-Situations); however, these two temperament variables did not interact with each other to influence preschoolers' emotion understanding.

Conclusions about prefers familiar/routine, effortful control, and emotion understanding. In the current study, children who were rated as having a high preference for routine and familiar activities had more difficulty accurately identifying emotions in hypothetical emotion-evoking situations (ECT-Situations). Research has demonstrated that children who show wariness in response to unfamiliar situations, are often categorized as behaviorally inhibited, and are more likely to experience internalizing difficulties (e.g. anxiety) (Chronis-Tuscano, et al., 2009). Therefore, the tendency to have strong preferences for the routine/familiar is an important vulnerability factor in predicting difficulty with emotion understanding, and later internalizing problems.

Effortful control by definition is the ability to inhibit a dominant response in order to perform a more desirable response. It involves the ability to focus and sustain attention as needed, and the ability to regulate behavior (Rueda, 2012). Effortful control has been linked with better social competence, and/or better emotion understanding during social situations (Moran, Lengua, & Zalewski, 2013). In the current study, children who earned higher scores on Effortful Control also earned higher (more accurate) scores on interpreting hypothetical emotion-evoking situations (ECT-Situations). Therefore, effortful control can be conceptualized as a resiliency factor in protecting children from having difficulty with emotion understanding and social competence.

Although higher scores on Effortful Control predicted higher (more accurate) scores on ECT-Situations, Effortful Control did not moderate the relationship between the Prefers Familiar/Routine factor and the ECT-Situations measure.

Research Hypothesis 4

It was anticipated that the Prefers Familiar/Routine STI factor would be negatively correlated with the Internalizing scale on the SCBE; and that the Sociability STI factor would be positively correlated with the Internalizing scale on the SCBE (based on low T-scores signifying more internalizing behaviors). Both of these original hypotheses were confirmed in Research Hypothesis 2. It was also hypothesized that Effortful Control would moderate these relationships so that: 1. The risk of having difficulty with Internalizing is greater for those rated high on the Prefers Familiar/Routine factor, and low on Effortful Control; and 2. The risk of having difficulty with Internalizing is greater for those rated low on the Sociability factor, and low on Effortful Control.

Main effects for sociability. The Sociability factor had a main effect on Internalizing scores; it significantly predicted Internalizing scores when controlling for the effects of Effortful Control. For example, children who were rated high on Sociability also displayed the best behavioral adjustment. Effortful Control did not have a significant main effect on Internalizing scores; it did not significantly predict Internalizing scores when controlling for the effects of Sociability. However, the model including Sociability and Effortful Control was approaching statistical significance in explaining 8% of the variance in Internalizing scores. These analyses demonstrated the

importance of Sociability as a resiliency factor in preventing the development of internalizing behaviors.

Interaction effect approaching significance. The addition of the interaction term (Sociability x Effortful Control) did not contribute significantly to the predictive value of Internalizing scores, but was approaching significance. In addition, the model including Sociability, Effortful Control, and their interaction, was approaching statistical significance in explaining 13% of the variance in Internalizing scores.

A simple slope analysis demonstrated that a significant slope existed for high levels of Effortful Control; but not for low levels of Effortful Control. In other words, preschoolers who were rated high in Sociability and high in Effortful Control displayed the best behavioral adjustment (i.e. fewest Internalizing behaviors). Interestingly, preschoolers who were rated low in Sociability, and high in Effortful Control, displayed the most Internalizing behaviors. This subgroup of children was rated as being socially avoidant (i.e. low scores on Sociability), but also likely hypervigilant to threat (i.e. high scores on the indices that make up Effortful Control – Attentional Focusing and Inhibitory Control). Previous research has also documented the link between increased vigilance, or heightened attentional control, towards threat and the later development of anxiety (Lonigan & Vasey, 2009).

This analysis was instrumental in demonstrating that high Effortful Control is a resiliency factor only when paired with high levels of Sociability. Children who were rated as having low Effortful Control, and low Sociability were rated as being better behaviorally adjusted than those rated high on Sociability. Children who struggle to regulate their attention and inhibitory control (i.e. effortful control) during social

interactions are likely to have more behavioral adjustment difficulties (e.g. difficulty regulating their behaviors and attending to important social cues).

Conclusions about sociability, effortful control, and internalizing. In the current study, children who were rated highly sociable, and had high levels of effortful control, were also rated as having the fewest internalizing behaviors, or demonstrating the best behavioral adjustment. Previous research has demonstrated that preschoolers learn how to process information through their own emotional experiences in social interactions. Furthermore, children's knowledge about, and regulation of, their emotions (i.e. effortful control) is directly related to their adaptive social functioning (Denham, Way, Kalb, Warren-Khot, & Bassett, 2013).

Children in the current study, who were rated low in sociability, and high on levels of effortful control, displayed the most internalizing behaviors. Previous research has supported that behaviorally inhibited children, children who are wary in social situations, have higher rates of internalizing problems. In addition, high vigilance (i.e. high attentional control) has been associated with higher levels of behavioral inhibition (low sociability) and internalizing problems (Dyson et al., 2011). Therefore, it is not surprising that this subgroup of children rated low in sociability, and high in attentional control and inhibitory control (i.e. effortful control), were also rated as having the most internalizing behaviors.

Main effects for prefers familiar/routine. The Prefers Familiar/Routine (STI) factor had a significant main effect on Internalizing (SCBE) scores, such that children who were rated high on preferring familiar activities were also rated as experiencing more internalizing behaviors, when controlling for Effortful Control. Effortful Control

did not have a significant main effect on Internalizing (SCBE) scores; it did not significantly predict Internalizing scores when controlling for Prefers Familiar/Routine. However, the model that included the Prefers Familiar/Routine and Effortful Control variables significantly predicted 10% of the variance in children's Internalizing scores, which demonstrates the importance of the Prefers Familiar/Routine variable in the development of behavioral adjustment, or pathology, in preschool.

Non-significant interaction effect. The addition of the interaction term (Prefers Familiar/Routine x Effortful Control) did not contribute significantly to the predictive value of Internalizing scores. In other words, the Prefers Familiar/Routine variable uniquely contributed to children's internalizing behaviors (SCBE), but Effortful Control did not uniquely contribute to children's internalizing behaviors (SCBE). Furthermore, the Prefers Familiar/Routine and Effortful Control variables did not interact with each other to influence preschoolers' internalizing behaviors.

Conclusions about prefers familiar/routine, effortful control, and internalizing. Children from the current study who were rated as preferring to stick with familiar activities and routine, were also rated as experiencing more internalizing behaviors. Previous research has demonstrated that children who prefer to stick with familiar routines also tend to experience frustration (because they may desire to approach, but anxiety prevents them), and negative emotionality (because their attention is focused on self-defeating thoughts and negative self-evaluations). Repeated experiences with these negative self-evaluations can lead to internalizing behaviors such as sadness, anxiety, and shyness (Eggum, Eisenberg, Reiser, Spinrad, Valiente, & Sallquist, 2012).

Effortful Control did not have a significant main effect on Internalizing scores; nor did it moderate the relationship between the Prefers Familiar/Routine factor and Internalizing. Children from the current study who were rated as having a high preference for familiar/routine activities were more vulnerable to developing internalizing behaviors regardless of their level of effortful control.

Virtues and Implications

Virtues. One of the main virtues of the current study is that it adds specific information to the body of research on the development of internalizing disorders. The most recent edition of the *Handbook of Temperament* (Zentner & Shiner, 2012) specifically recommends that additional research be conducted examining narrower constructs, narrower dimensions of temperament, to achieve greater specificity in the connection between temperament and internalizing. The current study provided greater specificity in examining the Approach/Avoidance dimension of temperament by closely examining the three Approach/Avoidance factors on the STI (Prefers Familiar/Routine, Sociability, and Risk Seeking). This close examination provided in-depth information about how these three factors on the STI related to the well-validated CBQ, as well as their connection to children's emotion understanding, and internalizing problems.

This study also provided information about temperament risk factors (avoidance, negative emotionality, and high reactivity) and protective factors (effortful control and sociability) that have the potential to lead to internalizing problems or behavioral adjustment. The information gained in this study lends itself to future work towards early interventions with preschoolers displaying temperament risk factors.

In addition, developmental psychopathology researchers have called for a multiple-level-analysis approach to studying factors that affect child outcomes. It is important to examine and understand the multiple developmental pathways that lead to psychopathology and resilience in children (Cicchetti & Curtis, 2007). The current study highlighted the temperament risk factors of avoidance, negative emotionality, and high reactivity in the Prefers Familiar/Routine factor (STI); as well as demonstrated how Effortful Control and the Sociability (STI) factor act as protective factors against the development of emotion understanding and internalizing problems. Furthermore, the qualitative parent examples on the STI allowed for a close examination of the unique aspects of temperament that contribute to different developmental outcomes.

Implications for measurement. The current study highlighted several benefits to using the STI: it breaks the Approach/Avoidance scale down into 3 facets (Prefers Familiar/Routine, Sociability, and Risk Seeking); it allows for examination of parent qualitative examples on the Approach/Avoidance dimension of temperament; and it correlates highly with the well-validated CBQ. Data obtained from the bivariate correlations between the CBQ and the STI suggest that there could be benefits to restructuring the STI Approach/Avoidance dimension in order to collect more detailed information within each facet of Approach/Avoidance. For example, the Prefers Familiar/Routine (STI) factor was positively correlated with Shyness and negatively correlated with Impulsivity on the CBQ. Furthermore, the Shyness and Fear scales on the CBQ were positively correlated. If one was to restructure the STI using information gathered from the current study, specific answers endorsing high Prefers Familiar/Routine might lead to additional questions regarding qualitative aspects of

Shyness and Fear. In other words, one could restructure the STI to include mandatory probes after parents endorsed particular items across the Approach/Avoidance dimension. This restructuring would provide greater specificity in the quality of the child's approach/avoidance tendencies.

Implications for school contexts. Longitudinal studies have demonstrated that certain temperament features are linked to children's school performance. For example, high adaptability/persistence and low activity levels are associated with better academic performance. Studies with teachers have shown that they prefer students who are less active, less distractible, and more persistent. These preferences can lead to modification of teaching behaviors directed towards these types of students including better student-teacher relationships, more willingness to help, and more patience (Fernandez-Vilar & Carranza, 2013). Based on these preferences children from the current study who were rated high on the Sociability factor, and had high levels of Effortful Control, would likely have the best student-teacher relationships. This group of children would be most likely to adapt to changes in their environment, but also have the self-regulation capacity to display good behavioral adjustment in the classroom.

Children's development of effortful control has been specifically linked with better learning outcomes in reading and math and better classroom behaviors. Whereas, negative affectivity/emotionality has been shown to have a negative relationship with school performance (Fernandez-Vilar & Carranza, 2013). Based on results from the current study, children who were rated high on the Prefers Familiar/Routine (STI) factor would have difficulty in school due to their tendency to display negative emotionality and high reactivity. However, children from the current study who were rated as having well-

developed effortful control would likely have better academic outcomes due to their ability to override dominant responses in favor of more acceptable behaviors in the classroom.

Effortful control in school contexts. Children rated high in effortful control tend to feel more comfortable in their school environment than those rated low in effortful control, largely due to the fact that they have the skills needed to regulate their emotions and behaviors. Children rated low in effortful control tend to experience more emotional distress and social isolation, which can lead to less closeness with teachers and an increase in dislike of school. In addition, children with fewer social skills are rated as more difficult to teach, and they receive less positive feedback from their teachers (Valiente, Swanson, & Lemery-Chalfant, 2012). The current study demonstrated that children who are rated high on the Prefers Familiar/Routine (STI) factor have more difficulty understanding emotions in hypothetical situations; and this subgroup of children was also more likely to experience internalizing problems. Based on the research cited this group of children is in need of early intervention to help foster positive peer and student-teacher relationships, and to develop better effortful control early on.

Implications for school psychologists. It is believed to be best practice for school psychologists to evaluate children's environments to identify areas of need, and to directly connect assessment to intervention. Temperament is connected to a variety of school related variables including social competence. Although critical to understanding child development, temperament is not typically assessed in a standard psychoeducational battery. Therefore, there is currently a need to begin incorporating more early assessment of temperament. If school psychologists begin incorporating more

measures of temperament during preschool assessments, they would obtain valuable information about overall school readiness and adjustment (Griggs, Gagnon, Huelsman, Kidder-Ashley, & Ballard, 2009). The current study provides rich information to support the STI being used for the collection of detailed information about preschool temperament.

With an increasing focus on teacher, psychologist, school, and administrator accountability, fostering social-emotional competence has become essential in paving the way for academic success. Some researchers have suggested that incorporating social-emotional programs early on in school will assist in reducing academic underachievement. For example, current research has illustrated that school-based social-emotional interventions contributed to an 11-percentile increase in standardized achievement test scores (Rhoades, et al., 2011). Early social-emotional interventions would then serve the dual purpose of fostering social competence and better developed academic skills. Findings from the current study show that the collection of basic temperament information can provide rich information about preschoolers' temperament profiles and allow for the targeting of specific lagging temperament traits that could benefit from early intervention. For example, children in the current study who earned low ratings on the Sociability factor, and high ratings on Effortful Control, would be a prime target for early intervention to prevent the development of difficulty with emotion understanding and internalizing problems.

Limitations

SES/education level. A strength of the current study was the ethnic composition, with approximately 50% of the population being European-American; however, the

sample was relatively homogenous in socio-economic status due to the preschool being part of a university setting. The SCBE was standardized with a similar gender distribution as the current study (50% female & 50% male); and the ethnicity makeup of the SCBE standardization population was also similar to the current study (68% of the participants were White, 20% were Black, 7% were Hispanic, and 4% were Asian). The current study population differed from the SCBE standardization population most in parent education level. All parents from the current study sample obtained at least some college education; whereas, only 30% of the SCBE parent population obtained post-high school education (LaFreniere & Dumas, 2003). Future studies may attempt to recruit participants from both a university setting and a community based preschool to allow for more diversity in socio-economic background.

Power. A second limitation to the current study was that the regression analyses were slightly underpowered. The regression analysis predicting Emotion Understanding (ECT-Situations) had $n = 63$ complete data sets; and the regression analyses predicting Internalizing (SCBE) had $n = 66$ complete data sets for each regression. In order to detect a medium effect size (.15) for a regression model including 3 predictors, with a desired power level of .80 or higher, you need a sample size of at least 76. Future studies might consider imputing the mean for missing data in order to increase statistical power.

Generalizability. The current study sample is likely only generalizable to comparable preschool samples on university campuses. The sample was representative of a highly educated group of parents, with an employment connection to the university, who were largely part of middle-class families.

Social-emotional information. The current study did not include a measure of child psychopathology. While parents may have provided this information during their completion of the STI, there were no formal questions regarding clinical diagnoses or social-emotional difficulties for the preschoolers included in this study. Future studies may consider including direct questions about early social-emotional diagnoses and/or early interventions that the children are participating in. This would allow for differentiation between behavioral responses that fall along the normal continuum of temperamental differences, and responses that fall within the clinical classification.

Future Directions

The current study demonstrated the importance of effortful control, the ability to inhibit a dominant response for a more favorable response, control of attention, and behavioral regulation (Rueda, 2012). Children with poorly developed effortful control are at-risk of becoming behaviorally inhibited, anxious, and/or depressed (Fox & Pine, 2012). The current study highlighted the importance of effortful control in that it had a main effect on children's emotion understanding scores (higher effortful control was associated with more accurate emotion understanding). In addition, the interaction effect of Sociability x Effortful Control was approaching significance in predicting Internalizing scores. In other words, children who were rated as highly sociable, and had high levels of effortful control, displayed the best behavioral adjustment (fewest internalizing behaviors).

Future studies may consider targeting a population of preschoolers who are avoidant and have poorly developed effortful control. These studies and/or early interventions could train avoidant preschoolers on how to better control their attention.

The purpose of this training would be to help preschoolers attend more to neutral stimuli and less to the stimuli they perceive as threatening (Fox & Pine, 2012); this practice would allow for the development of effortful control over time.

Future studies may also wish to include a clinical population of children in order to better understand temperament risk and resiliency factors within this group. The majority of the participants in the current study fell within the normal continuum of temperamental differences. Children at the extreme ends of this continuum were shown to be at an increased risk of developing difficulties with emotion understanding and internalizing problems. It is important to continue to study children who fall at the extreme ends of the normal temperament continuum, and a population of children who fall in the clinical range of experiencing behavioral difficulties. The connections between avoidance, high reactivity, negative emotionality, effortful control, emotion understanding, and internalizing may be more pronounced when examining a population of children with clinical diagnoses of internalizing problems.

Conceptual Summaries

Tables 21 and 22 are conceptual summaries of the relations between the Approach/Avoidance dimension of temperament (STI and CBQ), Emotion Understanding (ECT), and Internalizing (SCBE). Table 21 is a conceptual summary of the bivariate correlations; and Table 22 is a conceptual summary of the hierarchical regressions.

Table 21

Conceptual Summary for Correlations

<u>STI Factors</u>	<u>CBQ Scales</u>		<u>Emotion</u>	<u>Internalizing (SCBE)</u>	
	Positive Correlation	Negative Correlation	<u>Understanding (ECT)</u> Negative Correlation	Positive Correlation	Negative Correlation
Prefers Familiar/Routine	<ul style="list-style-type: none"> • Shyness 	<ul style="list-style-type: none"> • Impulsivity 	<ul style="list-style-type: none"> • High Prefers Familiar / Routine was associated with poor ECT-Situations scores (hypothetical emotion-evoking situations) 		<ul style="list-style-type: none"> • High Prefers Familiar / Routine was associated with more Internalizing behaviors
Sociability	<ul style="list-style-type: none"> • Smiling & Laughter • Activity Level • Impulsivity 	<ul style="list-style-type: none"> • Shyness 	<ul style="list-style-type: none"> • No significant correlations 	<ul style="list-style-type: none"> • High Sociability was associated with better behavioral adjustment (less internalizing behaviors) 	
Risk Seeking	<ul style="list-style-type: none"> • High Intensity Pleasure • Activity Level • Impulsivity 	<ul style="list-style-type: none"> • Sadness 	<ul style="list-style-type: none"> • No significant correlations 	<ul style="list-style-type: none"> • No significant correlations 	<ul style="list-style-type: none"> • No significant correlations

Table 22

Conceptual Summary for Hierarchical Regressions

	Emotion Understanding (ECT-Situations)	Internalizing (SCBE)
Prefers Familiar/Routine (STI)	<ul style="list-style-type: none"> Significant main effect; high scores on Prefers Familiar/Routine predicted less accurate Emotion Understanding on ECT-Situations measure when controlling for Effortful Control 	<ul style="list-style-type: none"> Significant main effect; high scores on Prefers Familiar/Routine predicted more internalizing behaviors on the SCBE when controlling for Effortful Control
Sociability (STI)	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Significant main effect; high scores on Sociability predicted less internalizing behaviors on SCBE when controlling for Effortful Control
Effortful Control (CBQ)	<ul style="list-style-type: none"> Significant main effect; high scores on Effortful Control predicted more accurate Emotion Understanding on ECT-Situations measure when controlling for Prefers Familiar/Routine 	<ul style="list-style-type: none"> No significant main effect when controlling for Sociability No significant main effect when controlling for Prefers Familiar/Routine
Prefers Familiar/Routine x Effortful Control	<ul style="list-style-type: none"> No significant interaction 	<ul style="list-style-type: none"> No significant interaction
Sociability x Effortful Control	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Interaction effect approaching significance; significant simple slope for high Effortful Control

Closing Narrative

The findings from the current study are illustrated through a narrative of two preschoolers: one who is vulnerable to developing adjustment problems, and one with a well-adjusted behavioral profile. The purpose of these narratives is to give practical examples of the research findings. Two preschoolers and their parents recently volunteered to participate in a research study regarding preschool temperament. Each parent completed a parent-questionnaire (CBQ) and an interview with a research assistant (STI). Their preschool teacher completed a behavioral questionnaire for each of these students (SCBE), and each preschooler met with a research assistant to answer questions about emotion understanding (ECT).

Hailey (4-years-old), and her mother Mrs. Smith, participated in the research study regarding preschool temperament. When Mrs. Smith was interviewed about Hailey's temperament (STI) she described Hailey as always preferring to stick with routines. For example, she becomes upset if they do not drive the exact same route each time they drive to preschool in the morning. In addition, if Hailey is asked to try a new activity she often hangs back and needs a lot of coaxing and explanations before she is willing to try the activity (high ratings on Prefers Familiar/Routine). When Mrs. Smith completed her parent questionnaire (CBQ), she described Hailey as being uneasy around people she has known for some time; acting shy around new people; and being uncomfortable asking other children to play (high Shyness). In addition, Mrs. Smith shared that Hailey takes a long time to approach new situations, and is among the last children to try new activities (low Impulsivity). Mrs. Smith also rated Hailey as having difficulty with attention and inhibitory control (low Effortful Control). When Hailey met

with the research assistant, she was read 15 vignettes that included emotion-evoking situations. Unfortunately, Hailey was not able to earn credit for many of these vignettes because she did not understand the puppet's emotions in different situations (low scores on ECT-Situations). Hailey's classroom teacher completed her rating scale (SCBE) and shared that Hailey is a child who rarely smiles; is ignored by peers; is hesitant to join most activities; and often appears fearful in school (low scores on Internalizing scale; high internalizing behaviors). Hailey is a preschooler who is vulnerable to developing adjustment problems, and is in need of early intervention to develop better effortful control and emotion understanding skills. Potentially, early intervention will work toward ameliorating the development of more long-term adjustment difficulties including anxiety, social isolation, student-teacher relationship difficulties, and depression.

Sara (4-years-old), and her mother Mrs. Jones, also participated in the research study regarding preschool temperament. When Mrs. Jones was interviewed about Sara's temperament (STI) she described Sara as enjoying playing with others in the classroom and being enthusiastic when playing with her friends. For example, she shared that Sara is great at making new friends when they visit the playground, and she is excited to include new children into her group of friends (high ratings on Sociability). When Mrs. Jones completed her parent questionnaire (CBQ), she described Sara as often smiling and laughing out loud when playing with other children (high Smiling & Laughter). In addition, she shared that Sara has a good amount of energy and likes to play active games (high Activity Level). Mrs. Jones also shared that Sara is able to control her attention and can self-regulate her behaviors (high Effortful Control). When Sara met with the research assistant, she was also read 15 vignettes that included emotion-evoking

situations. Sara did an excellent job differentiating between the emotions of happy, sad, mad, scared, or no feeling to provide accurate answers to the hypothetical vignettes (high scores on ECT-Situations). Sara's classroom teacher completed her rating scale (SCBE) and shared that Sara is a child who has a positive attitude in school; is often eager to participate in group activities; appears to have a positive self-concept; and is well-integrated into the preschool environment (high scores on Internalizing scale; high overall behavioral adjustment; no internalizing concerns). Sara is a well-adjusted preschooler who can serve as a positive peer model in a social skills group to foster the development of effortful control and emotion understanding for children having difficulty with these skills.

Appendices

Appendix A

Table 23

Historical Sketch of Temperament

Author(s)	Definitions
Allport (1920's)	The characteristic phenomena of an individual's nature, including his susceptibility to emotional stimulation, his customary strength and speed of response, the quality of his prevailing mood, and all the peculiarities of fluctuation and intensity of mood, these being the phenomena regarded as dependent on constitutional make-up and therefore largely hereditary in origin.
Buss and Plomin (1984)	Temperament is inherited personality traits that are present in early childhood. The three personality traits include: emotionality, activity, and sociability as being the foundation for personality.
Eysenck (1940's)	Temperament is more or less a stable enduring system of affective behavior.
Goldsmith and Campos (1987)	Temperament is individual differences in emotionality including individual differences in fear, anger, sadness, pleasure, interest, etc.
Kagan and Snidman (2004)	Temperament is a reflection of features that are inherent in the individual at birth, or an inherited biology.
Rothbart (2007)	Temperament is defined as individual differences in emotional, motor, and attentional reactivity measured by latency, intensity, and recovery of response, and self-regulation processes such as effortful control that modulate reactivity.

Historical Sketch of Temperament

Author(s)	Definitions
Strelau (1998)	Temperament is relatively stable across time as compared with other phenomena and is characterized by cross-situational consistency. Temperament has a biological basis and refers mainly to behavioral reactions such as intensity, energy, strength, speed, tempo, fluctuation, and mobility.
Thomas and Chess (1977)	Thomas and Chess posited one of the most popular definitions of temperament. They are known as the founders of contemporary temperament research in children and consider temperament as a behavioral style. They thought that temperament was best viewed as the ‘how’ of behavior. They believed it differed from ability, which is concerned with the ‘what’ and ‘how well’ of behaving, and from motivation, which accounts for why a person does what he/she is doing. They believed that temperament concerned the way in which a person behaves.

Appendix B

Exploratory Factor Analysis

A principal components analysis, using direct oblimin rotation, was performed (Gifford, 2012) to assist in determining which factors comprised the Approach/Avoidance scale on the STI. As shown in Table 24 the tests of assumptions were established for the STI Approach/Avoidance scale. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO = .73) was acceptable, and the Bartlett's Test of Sphericity was significant ($p < .000$). The KMO provides a measure of sampling adequacy to determine if principal components analysis is appropriate to use with the existing sample size. KMO values between 0.5 and 1.0 indicate that principal components analysis is appropriate, and a KMO value of 0.6 is a suggested minimum. The established KMO value (.73) confirmed that the sample size was appropriate to use with principal components analysis. Bartlett's Test of Sphericity is a test statistic used to examine the hypothesis that variables are uncorrelated in the population (Fabrigar & Wegener, 2012). The Bartlett's Test of Sphericity was significant ($p < .000$) indicating correlated variables.

Table 24

<i>Tests of Assumptions of STI</i>		
KMO Sampling Adequacy		.73
Bartlett's Test of Sphericity	χ^2	535.07
	<i>df</i>	120
	<i>p</i>	.000

$p < .000$

The individual item loadings within the Approach/Avoidance STI scale were examined (Table 25) and helped to create the names of each factor. Items 68, 61, 66, 69, 70, and 64 loaded onto Factor 1: Prefers Familiar/Routine. Items 74, 76, 73, 72, 78, 75, and 77 loaded onto Factor 2: Sociability. Finally, items 63, 71, and 65 loaded onto Factor

3: Risk Seeking. The pattern matrix for the STI Approach/Avoidance factors is shown in the table below.

Table 25

Pattern Matrix of STI Approach/Avoidance: Item Loadings on Three Main Factors

Item	Factor		
	Prefers Familiar/Routine	Sociability	Risk Seeking
Item 68: seeks departure from routine	-.81	-.04	-.05
Item 61: prefers routine	.81	.08	.01
Item 66: familiar	.63	-.33	.21
Item 69: asked to try new activity	.56	.36	-.27
Item 70: seeks adventure, excitement	-.49	-.09	.41
Item 64: novel but not risky	.47	.28	-.19
Item 73: lively enthusiasm in group	.06	-.71	-.003
Item 74: approach unfamiliar adults in familiar settings	-.15	-.69	-.05
Item 72: preference for company	.02	-.69	-.21
Item 76: if approached by less familiar children	.05	.69	-.08
Item 75: approach familiar adults	.19	-.67	-.03
Item 78: initiates with peers outside circle of friends	.04	.66	-.10
Item 77: approaches well known adults outside immediate family	.12	.59	-.02
Item 63: approaches pleasant though told could get hurt	.08	.15	.91

Pattern Matrix: Item Loadings on Three Main Factors

Item	Factor		
	Prefers Familiar/Routine	Sociability	Risk Seeking
Item 71: seeks fun though understands that may hurt someone	.18	-.03	.88
Item 65: risky	.20	-.03	-.73

The principal components analysis determined that three factors comprise the Approach/Avoidance scale on the STI. The two STI items with the highest loadings on their respective factors were chosen in order to name each factor. The three STI factors are Prefers Familiar/Routine, Sociability, and Risk Seeking. These factors and their respective two highest loaded items are shown in Table 26.

Table 26

<i>Approach/Avoidance Factors and Items</i>	
Factor	Item
Prefers Familiar/Routine	68: To what extent does the child seek situations that depart from the routine? 61: To what extent does the child prefer routine situations as opposed to novel situations?
Sociability	74: To what extent does the child approach unfamiliar adults in familiar surroundings? 73: How lively and enthusiastic versus subdued is your child when interacting in a group setting?
Risk Seeking	63: To what extent would the child approach a pleasant situation after being told that someone could get hurt? 71: Would the child engage in a fun activity even after understanding that someone could get hurt?

Appendix C

Descriptive Data

The following tables provide descriptive data for the different measures used in the current study (STI, CBQ, ECT, and SCBE).

Table 27

Descriptive Data for the STI

Factor	<i>M</i>	<i>SD</i>	Minimum	Maximum
Prefers Familiar/Routine	2.90	.56	1.83	4.83
Sociability	3.83	.63	2.43	5.00
Risk Seeking	3.11	1.02	1.00	5.00

Note. The Likert scale for this measure ranged from 1 (low on that factor) to 5 (high on that factor).

Table 28

Descriptive Data for the ECT and SCBE

Measure	<i>M</i>	<i>SD</i>	Minimum	Maximum
ECT-Situations	35.12	5.89	15	42
SCBE - Internalizing	49.01	8.54	31	70

Note. The minimum possible ECT-Situations score was 15, and the highest possible score was 45. The SCBE Internalizing scale was calculated based on T-scores with a mean of 50 and a standard deviation of 15.

Table 29

Descriptive Data for the CBQ

Scale	<i>M</i>	<i>SD</i>	Minimum	Maximum
Activity Level	4.78	.84	2.43	7.00
Anger/Frustration	4.25	1.17	1.50	6.67
Approach/Positive Anticipation	5.15	.84	2.33	6.83
Attentional Focusing	5.21	.98	2.33	7.00
Discomfort	3.97	1.36	1.17	6.83
Falling Reactivity/Soothability	4.94	1.05	2.00	6.83
Fear	4.14	1.24	1.83	6.83
High Intensity Pleasure	4.83	1.05	2.50	7.00
Impulsivity	3.97	1.07	1.33	6.67
Inhibitory Control	4.90	.84	1.83	6.33
Low Intensity Pleasure	5.90	.65	4.00	7.00
Perceptual Sensitivity	5.55	.90	2.83	7.00
Sadness	4.29	.93	2.29	6.14
Shyness	3.64	1.34	1.00	6.83
Smiling & Laughter	5.98	.64	4.00	7.00
Effortful Control	5.07	.76	2.75	6.83

Note. The Likert scale for this measure ranged from 1 (low on that scale) to 7 (high on that scale).

Appendix D

Table 30

Correlation Matrix for Prefers Familiar/Routine STI factor and all CBQ Scales

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Prefers Familiar/Routine	1.00	-.20	.08	-.12	-.16	.19	-.12	.18	-.16	-.50^b	-.04	-.13	-.02	.09	.40^b	-.18
2. Activity Level		1.00	.32 ^b	.36 ^b	-.13	-.05	-.09	.13	.49 ^b	.55 ^b	-.37 ^b	-.02	-.01	.06	-.19	.19
3. Anger / Frustration			1.00	.32 ^b	-.20 ^a	.24 ^a	-.50 ^b	.36 ^b	.05	.15	-.35 ^b	-.09	-.16	.50 ^b	.21 ^a	-.08
4. Approach / Positive Anticipation				1.00	-.04	.12	-.07	.25 ^a	.14	.30 ^b	-.03	.15	.16	.41 ^b	-.18	.21 ^a
5. Attentional Focusing					1.00	-.04	.12	-.25 ^a	-.001	-.08	.25 ^a	.21 ^a	-.03	.03	-.16	.18
6. Discomfort						1.00	-.33 ^b	.26 ^a	.002	-.04	-.06	.07	-.01	.32 ^b	.20	.06
7. Falling Reactivity / Soothability							1.00	-.16	-.05	-.03	.45 ^b	.32 ^b	.47 ^b	-.28 ^a	-.24 ^a	.34 ^b
8. Fear								1.00	.04	.06	-.24 ^a	-.11	.07	.51 ^b	.28 ^a	-.14
9. High Intensity Pleasure									1.00	.51 ^b	-.29 ^b	.09	.05	-.06	.01	.09
10. Impulsivity										1.00	-.37 ^b	-.02	-.02	.09	-.54 ^b	.22 ^a
11. Inhibitory Control											1.00	.22 ^a	.32 ^b	-.14	-.13	.19
12. Low Intensity Pleasure												1.00	.37 ^b	-.02	-.07	.41 ^b
13. Perceptual Sensitivity													1.00	.16	-.12	.32 ^b
14. Sadness														1.00	.03	.07
15. Shyness															1.00	-.25 ^a
16. Smiling and Laughter																1.00

^a $p < .05$; ^b $p < .01$

Table 31

Correlation Matrix for Sociability STI factor and all CBQ Scales

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Sociability	1.00	.23^a	-.01	.22	.08	-.04	.11	-.21	.08	.54^b	-.04	.12	.09	.10	-.67^b	.38^b
2. Activity Level		1.00	.32 ^b	.36 ^b	-.13	-.05	-.09	.13	.49 ^b	.55 ^b	-.37 ^b	-.02	-.01	.06	-.19	.19
3. Anger / Frustration			1.00	.32 ^b	-.20 ^a	.24 ^a	-.50 ^b	.36 ^b	.05	.15	-.35 ^b	-.09	-.16	.50 ^b	.21 ^a	-.08
4. Approach / Positive Anticipation				1.00	-.04	.12	-.07	.25 ^a	.14	.30 ^b	-.03	.15	.16	.41 ^b	-.18	.21 ^a
5. Attentional Focusing					1.00	-.04	.12	-.25 ^a	-.001	-.08	.25 ^a	.21 ^a	-.03	.03	-.16	.18
6. Discomfort						1.00	-.33 ^b	.26 ^a	.002	-.04	-.06	.07	-.01	.32 ^b	.20	.06
7. Falling Reactivity / Soothability							1.00	-.16	-.05	-.03	.45 ^b	.32 ^b	.47 ^b	-.28 ^a	-.24 ^a	.34 ^b
8. Fear								1.00	.04	.06	-.24 ^a	-.11	.07	.51 ^b	.28 ^a	-.14
9. High Intensity Pleasure									1.00	.51 ^b	-.29 ^b	.09	.05	-.06	.01	.09
10. Impulsivity										1.00	-.37 ^b	-.02	-.02	.09	-.54 ^b	.22 ^a
11. Inhibitory Control											1.00	.22 ^a	.32 ^b	-.14	-.13	.19
12. Low Intensity Pleasure												1.00	.37 ^b	-.02	-.07	.41 ^b
13. Perceptual Sensitivity													1.00	.16	-.12	.32 ^b
14. Sadness														1.00	.03	.07
15. Shyness															1.00	-.25 ^a
16. Smiling and Laughter																1.00

^a $p < .05$; ^b $p < .01$

Table 32

Correlation Matrix for Risk Seeking STI factor and all CBQ Scales

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Risk Seeking	1.00	.23^a	-.16	-.01	-.04	-.11	.06	-.19	.48^b	.37^b	-.02	-.02	.06	-.31^a	-.19	.02
2. Activity Level		1.00	.32 ^b	.36 ^b	-.13	-.05	-.09	.13	.49 ^b	.55 ^b	-.37 ^b	-.02	-.01	.06	-.19	.19
3. Anger / Frustration			1.00	.32 ^b	-.20 ^a	.24 ^a	-.50 ^b	.36 ^b	.05	.15	-.35 ^b	-.09	-.16	.50 ^b	.21 ^a	-.08
4. Approach / Positive Anticipation				1.00	-.04	.12	-.07	.25 ^a	.14	.30 ^b	-.03	.15	.16	.41 ^b	-.18	.21 ^a
5. Attentional Focusing					1.00	-.04	.12	-.25 ^a	-.001	-.08	.25 ^a	.21 ^a	-.03	.03	-.16	.18
6. Discomfort						1.00	-.33 ^b	.26 ^a	.002	-.04	-.06	.07	-.01	.32 ^b	.20	.06
7. Falling Reactivity / Soothability							1.00	-.16	-.05	-.03	.45 ^b	.32 ^b	.47 ^b	-.28 ^a	-.24 ^a	.34 ^b
8. Fear								1.00	.04	.06	-.24 ^a	-.11	.07	.51 ^b	.28 ^a	-.14
9. High Intensity Pleasure									1.00	.51 ^b	-.29 ^b	.09	.05	-.06	.01	.09
10. Impulsivity										1.00	-.37 ^b	-.02	-.02	.09	-.54 ^b	.22 ^a
11. Inhibitory Control											1.00	.22 ^a	.32 ^b	-.14	-.13	.19
12. Low Intensity Pleasure												1.00	.37 ^b	-.02	-.07	.41 ^b
13. Perceptual Sensitivity													1.00	.16	-.12	.32 ^b
14. Sadness														1.00	.03	.07
15. Shyness															1.00	-.25 ^a
16. Smiling and Laughter																1.00

^a $p < .05$; ^b $p < .01$

Appendix E

Tables 33-35 depict the model, coefficients, and ANOVA summaries for the hierarchical regression predicting Emotion Understanding (ECT) from the Prefers Familiar/Routine factor (STI), Effortful Control (CBQ), and their interaction.

Table 33

Model Summary for Predicting Emotion Understanding (ECT) from Prefers Familiar/Routine (STI) and Effortful Control (CBQ)

Predictor	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	<i>SE</i>	Emotion Understanding ECT - Situations		<i>df</i> 1	<i>df</i> 2	<i>p</i> -value
					ΔR^2	ΔF			
<u>Model 1</u>									
Prefers Familiar/Routine	.43	.19**	.16	5.71	.19	6.93	2	60	.002
Effortful Control									
<u>Model 2</u>									
Prefers Familiar/Routine	.44	.20	.15	5.73	.01	.51	1	59	.48
Effortful Control									
Prefers Familiar/Routine x Effortful Control									

p* < .05; *p* < .01

Table 34

Coefficients Table for Predicting Emotion Understanding (ECT) from Prefers Familiar/Routine (STI) and Effortful Control (CBQ)

Predictor	Emotion Understanding ECT - Situations				
	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i> -value
<u>Model 1</u>					
Prefers Familiar/Routine	-3.32	1.31	-.30**	-2.5	.01
Effortful Control	2.14	.91	.28*	2.35	.02
<u>Model 2</u>					
Prefers Familiar/Routine	-8.66	7.61	-.78	-1.14	.26
Effortful Control	-.97	4.47	-.13	-.22	.83
Prefers Familiar/Routine x Effortful Control	1.05	1.49	.59	.71	.48

* $p < .05$; ** $p < .01$

Table 35

ANOVA Table for Predicting Emotion Understanding (ECT) from Prefers Familiar/Routine (STI) and Effortful Control (CBQ)

Predictor	SS	Emotion Understanding		F	p-value
		<u>ECT - Situations</u>			
		<i>df</i>	<i>MS</i>		
<u>Model 1</u>					
Regression	451.61	2	225.8	6.93**	.002
Residual	1955.0	60	32.59		
<u>Model 2</u>					
Regression	468.22	3	156.07	4.75**	.005
Residual	1938.39	59	32.85		

* $p < .05$; ** $p < .01$

Tables 36-38 depict the model, coefficients, and ANOVA summaries for the hierarchical regression predicting Internalizing (SCBE) from the Sociability factor (STI), Effortful Control (CBQ), and the interaction between them.

Table 36

Model Summary for Predicting Internalizing (SCBE) from Sociability (STI) and Effortful Control (CBQ)

<u>Internalizing</u>									
Predictor	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	<i>SE</i>	ΔR^2	ΔF	<i>df</i> 1	<i>df</i> 2	<i>p</i> -value
<u>Model 1</u>									
Sociability	.29	.08	.05	7.79	.08	2.80	2	63	.07
Effortful Control									
<u>Model 2</u>									
Sociability	.36	.13	.09	7.64	.05	3.53	1	62	.07
Effortful Control									
Sociability x Effortful Control									

p* < .05; *p* < .01

Table 37

Coefficients Table for Predicting Internalizing (SCBE) from Sociability (STI) and Effortful Control (CBQ)

<u>Internalizing</u>					
Predictor	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i> -value
<u>Model 1</u>					
Sociability	3.25	1.59	.25*	2.04	.05
Effortful Control	1.19	1.12	.13	1.07	.29
<u>Model 2</u>					
Sociability	-14.54	9.59	-1.11	-1.52	.14
Effortful Control	-11.23	6.71	-1.21	-1.68	.10
Sociability x Effortful Control	3.42	1.82	1.98	1.88	.07

* $p < .05$; ** $p < .01$

Table 38

ANOVA Table for Predicting Internalizing (SCBE) from Sociability (STI) and Effortful Control (CBQ)

<u>Internalizing</u>					
Predictor	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i> -value
<u>Model 1</u>					
Regression	339.93	2	169.96	2.80	.07
Residual	3826.51	63	60.74		
<u>Model 2</u>					
Regression	545.97	3	181.99	3.12*	.03
Residual	3620.47	62	58.40		

* $p < .05$; ** $p < .01$

Tables 39-41 depict the model, coefficients, and ANOVA summaries for the hierarchical regression predicting Internalizing (SCBE) from the Prefers Familiar/Routine factor (STI), Effortful Control (CBQ), and the interaction between them.

Table 39

Model Summary for Predicting Internalizing (SCBE) from Prefers Familiar/Routine (STI) and Effortful Control (CBQ)

<u>Internalizing</u>									
Predictor	<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	<i>SE</i>	ΔR^2	ΔF	<i>df</i> 1	<i>df</i> 2	<i>p</i> -value
<u>Model 1</u>									
Prefers Familiar/Routine	.31	.10*	.07	7.73	.10	3.41	2	63	.04
Effortful Control									
<u>Model 2</u>									
Prefers Familiar/Routine	.32	.10	.06	7.76	.01	.42	1	62	.52
Effortful Control									
Prefers Familiar/Routine x Effortful Control									

p* < .05; *p* < .01

Table 40

Coefficients Table for Predicting Internalizing (SCBE) from Prefers Familiar/Routine (STI) and Effortful Control (CBQ)

<u>Internalizing</u>					
Predictor	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i> -value
<u>Model 1</u>					
Prefers Familiar/Routine	-3.85	1.66	-.28*	-2.32	.02
Effortful Control	1.08	1.11	.12	.98	.33
<u>Model 2</u>					
Prefers Familiar/Routine	1.90	9.05	.14	.21	.83
Effortful Control	4.50	5.40	.49	.83	.41
Prefers Familiar/Routine x Effortful Control	-1.14	1.77	-.54	-.65	.52

* $p < .05$; ** $p < .01$

Table 41

ANOVA Table for Predicting Internalizing (SCBE) from Prefers Familiar/Routine (STI) and Effortful Control (CBQ)

<u>Internalizing</u>					
Predictor	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i> -value
<u>Model 1</u>					
Regression	406.73	2	203.37	3.41*	.04
Residual	3759.71	63	59.68		
<u>Model 2</u>					
Regression	431.95	3	143.98	2.39	.08
Residual	3734.49	62	60.23		

* $p < .05$; ** $p < .01$

Appendix F

Table 42

<i>Approach/Avoidance Literature Review</i>			
Reference	Article Summary	Sample	Measure(s) Cited
<p>Bjornebekk, G., & Diseth, A. (2010). Approach & avoidance temperaments and achievement goals among children. <i>Personality and Individual Differences, 49</i>, 938-943.</p>	<p>The present study investigates the relations between temperaments and achievement goals in a sample of 661 elementary school students to test the validity of the Elliott & Thrash (2002) model in an alternative sample by means of a more contemporary 2 x 2 achievement goal framework. A structural equation model supports previous findings that approach temperament serves as predictor of mastery–approach goals, performance approach goals and avoidance temperament of mastery–avoidance goals, performance–avoidance goals.</p>	<p>* 661 elementary school students</p>	<p>* Relationships between achievement goals; SEM supports approach temperaments & mastery approach goals</p>

Approach/Avoidance Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Chronis-Tuscano, A., Degnan, K.A., Pine, D.S., Perez-Edgar, K., Henderson, H.A., Diaz, Y., Raggi, V.L., & Fox, N.A. (2009). Stable early maternal report of behavioral inhibition predicts lifetime social anxiety disorder in adolescence. <i>Journal of the American Academy of Child & Adolescent Psychiatry, 48</i> , 928-935.	The current study used a prospective longitudinal design to determine whether stable early BI predicted the presence of psychiatric disorders and continuous levels of social anxiety in adolescents. It was hypothesized that stable BI would predict the presence of adolescent psychiatric diagnoses, specifically SAD. Results: Stable maternal-reported early BI was associated with 3.79 times increased odds of a lifetime SAD diagnosis, but not other diagnoses, during adolescence (95% confidence interval 1.18Y12.12). Stable maternal-reported early BI also predicted independent adolescent and parent ratings of ongoing social anxiety symptoms.	* 126 adolescents 14-16 years old who were first recruited at 4 months of age from hospital birth records. * Temperament was measured at multiple time points between the ages of 14 months and 7 years.	* Behavioral inhibition & social anxiety disorder * In adolescence, diagnostic interviews were conducted with parents and adolescents, and continuous measures of adolescent- and parent-reported social anxiety were collected.

Approach/Avoidance Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Crawford, N.A., Schrock, M., & Woodruff-Borden, J. (2011). Child internalizing symptoms: Contributions of child temperament, maternal negative affect, and family functioning. <i>Child Psychiatry & Human Development</i> , 42, 53-64.	The current study examines the relationship between child negative affect, effortful control, maternal negative affect, family functioning, and internalizing symptoms in a sample of preschool-aged children using a path analysis approach. Results support a complex model for the influence of both direct and indirect factors on internalizing symptoms in preschool-aged children.	* 65 children ages 3-5 years old & their mothers	* Measures of: child temperament; family environment; maternal personality; child internalizing symptoms
Elliot, A.J., & Thrash, T.M. (2002). Approach-avoidance motivation in personality: Approach and avoidance temperaments and goals. <i>Journal of Personality & Social Psychology</i> , 82, 804-818.	The present research examined the role of approach and avoidance motivation in models of personality. Specifically, it examined the hypothesis that approach and avoidance temperaments represent the foundation of several basic dimensions espoused in the trait adjective, affective disposition, and motivational system approaches to personality.	* Study 1: 165 undergraduate students * Study 2: 167 undergraduate students	* Extraversion & neuroticism = Costa & McCrae's NEO-FFI * Positive & negative emotionality = Watson & Clark's GTS * BAS & BIS = Carver & White's BAS & BIS scales * Response Bias = Paulhus' Balanced Inventory of Desirable Responding (BIDR)

Approach/Avoidance Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Elliot, A.J., & Thrash, T.M. (2010). Approach and avoidance temperament as basic dimensions of personality. <i>Journal of Personality</i> , 78, 865-906.	This research comprises 6 studies designed to examine approach and avoidance temperament as basic dimensions of personality. In Study 1= direct measures of approach and avoidance temperament. In Study 2 = the approach and avoidance temperament variables are not epiphenomena of response biases. In Study 3 = test-retest stability of the temperament variables. In Study 4 = approach and avoidance temperament are separate from other like-valenced variables and may be construed as the core of these variables. In Study 5 = approach and avoidance temperament are separate from chronic promotion and prevention foci. In Study 6 = documented the temperament variables as antecedents of achievement goals and achievement goals as proximal predictors of performance.	* 6 separate studies * Study 1 = 149 undergraduates completed Approach/Avoidance Temperament Questionnaire * Study 2 = 150 undergraduates * Study 3 = 161 undergraduates * Study 4 = 141 undergraduates * Study 5 = 139 undergraduates * Study 6 = 233 undergraduates	* Self-report measures of individual differences in approach and avoidance temperament to assess conceptually relevant variance, evidence of temporal stability, and predictive utility * Approach/Avoidance Temperament Questionnaire: 12 items (6 assessing approach & 6 assessing avoidance) * Balanced Inventory of Desirable Responding * EPQ-R to assess extraversion & neuroticism * Positive & Negative Affect Schedule to assess positive & negative emotionality (20 items) * Carver & Whites BAS & BIS scales * Regulatory Focus Questionnaire = chronic promotion and prevention foci * Achievement Goal Questionnaire (12 items) * Exam performance & GPA

Approach/Avoidance Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Fox, N.A., & Pine, D.S. (2012). Temperament and the emergence of anxiety disorders. <i>Journal of the American Academy of Child and Adolescent Psychiatry</i> , 51, 125-128.	* Study review	* Review of studies	* Examines attention-bias modification & therapy to reduce anxiety
Hane, A.A., Fox, N.A., Henderson, H.A., & Marshall, P.J. (2008). Behavioral reactivity and approach-withdrawal bias in infancy. <i>Developmental Psychology</i> , 44, 1491-1496.	799 infants screened at 4 months and at 9 months, infants who showed extreme patterns of motor and negative ($n = 75$) or motor and positive ($n = 73$) reactivity and an unselected control group ($n = 86$) were administered the LabTab, and baseline EEG data were collected. Negatively reactive infants showed significantly more avoidance than positively reactive infants and displayed a pattern of right frontal EEG asymmetry. Positively reactive infants exhibited significantly more approach behavior than controls and exhibited a pattern of left frontal asymmetry.	* 779 infants screened at 4 months for motor & emotional reactivity * 234 infants were assessed further at 9 months	* LABTAB * EEG * Results support the notion that approach-withdrawal bias underlies reactivity in infancy.

Approach/Avoidance Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Helfinstein, S.M., Fox, N.A., & Pine, D.S. (2012). Approach-withdrawal and the role of the striatum in the temperament of behavioral inhibition. <i>Developmental Psychology</i> , 48, 815-826.	Behavioral inhibition is a temperament characterized in infancy and early childhood by a tendency to withdraw from novel or unfamiliar stimuli. Children exhibiting this disposition, relative to children with other dispositions, are more socially reticent, less likely to initiate interaction with peers, and more likely to develop anxiety over time. Until recently, a dominant model attributed this disposition to reductions in the threshold for engaging the circuitry supporting fear learning, particularly the amygdala. Recent work, however, also has implicated striatal circuitry and other regions that constitute components of a presumed reward system. A series of studies found that behaviorally inhibited adolescents display heightened activation of striatal structures to cues indicating an opportunity to receive reward.	* Infancy - Adolescence	* Literature table linking novelty, attention, & reward to behavioral inhibition

Approach/Avoidance Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Lahat, A., Degnan, K.A., White, L.K., McDermott, J.M., Henderson, H.A., Lejuez, C.W., & Fox, N.A. (2012). Temperamental exuberance and executive functioning predict propensity for risk taking in childhood. <i>Development and Psychopathology</i> , 24, 847-856.	Used a multilevel approach to examine developmental trajectories in risk-taking propensity. We examined the moderating role of specific executive function components, attention shifting and inhibitory control, on the link between exuberant temperament in infancy and propensity for risk taking in childhood. Risk taking was assessed using a task previously associated with sensation seeking and antisocial behaviors. The results indicated that exuberance and attention shifting, but not inhibitory control, significantly interacted to predict propensity for risk taking. Exuberance was positively associated with risk-taking propensity among children who were relatively low in attention shifting but unrelated for children high in attention shifting.	* 291 infants seen at 4, 9, 24, & 36 months in the lab * Executive functioning was assessed at 48 months * Risk taking propensity was measured at 60 months	* Balloon analogue risk task (BART-Y) (youth-BART) * LAB-TAB * Dimensional Change Card Sort * Day-Night Stroop * Grass-Snow Stroop * Verbal IQ from WPPSI * Created longitudinal exuberance profiles = observed positive reactivity at 4 months; positive approach at 9 months; & positivity, approach, and sociability during risk-taking paradigm at 24 & 36 months

Approach/Avoidance Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Leerkes, E.M. (2011). Maternal sensitivity during distressing tasks: A unique predictor of attachment security. <i>Infant Behavior & Development, 34</i> , 443-446.	The extent to which maternal sensitivity during a non-arousing free play task and during distressing tasks at 6 months predicted infant–mother attachment security was examined. When considered simultaneously, only maternal sensitivity during distressing tasks predicted subsequent attachment security. Infant temperament was unrelated to attachment security.	* 101 mothers & infants * Mothers were 15-37 years old ($M = 27.79$ years); 64% had a college degree * Race: 72% European American; 25% African American * Median income = \$65K * 70 families were available at the 16-month follow-up	* 6 month laboratory visit for 10 minute free-play episode and 2 emotion eliciting tasks * ‘fear’ task consisted of a loud remote-controlled truck approaching infant for 3 sequences * ‘frustration’ task consisted of a gentle forearm restraint * Parent Caregiver Involvement Scale * Infant Affect was coded * Infant Behavior Questionnaire – Revised * Strange Situation in laboratory at 16 months old

Approach/Avoidance Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Olson, S.L., & Rosenblum, K. (1998). Preschool antecedents of internalizing problems in children beginning school: The role of social maladaptation. <i>Early Education & Development, 9</i> , 117-129.	The quality of children's social adaptation in preschool was related to levels of internalizing problem behavior following transition to kindergarten. Measures of peer acceptance, social skills, and social problem-solving ability were assessed in 79 4-5 year old children, and related to teacher's ratings of anxious/withdrawn behavior assessed concurrently and one year later. Girls tended to show higher levels of stability in internalizing problem behavior than boys. As predicted, preschool-age children with relatively high rates of internalizing problem behavior tended to manifest lower levels of social competence than others. Moreover, low levels of social competence in preschool were robust predictors of internalizing problems across the two time periods.	<ul style="list-style-type: none"> * 79 four and five-year-old preschoolers * All Caucasian children * Both university & community based preschools * SES = lower to upper middle class * Follow-up assessments conducted 1 year after original study with 56 children 	<ul style="list-style-type: none"> * Teachers completed a 42 item Behavior Problem Checklist; 2 factors = Conduct Problems & Anxiety-Withdrawal * Sociometric Measure of Peer Acceptance * Preschool Interpersonal Problem-Solving Test * Teachers rated children on the Preschool Competence Questionnaire (measured social competence) * Peabody Picture Vocabulary Test-Revised (PPVT-R)

Approach/Avoidance Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Putnam, S.P., & Stifter, C.A. (2002). Development of approach and inhibition in the first year: parallel findings from motor behavior, temperament ratings and directional cardiac response. <i>Developmental Science</i> , 5, 441-451.	Approach and inhibition were measured via latencies to touch low- and high-intensity objects, directional cardiac response to low- and high-intensity sounds and maternal ratings of positive and fearful emotionality. Inhibition showed considerable increases in all three domains from 6 to 12 months. Also reflecting increases in inhibitory processes, correlations between individual infants' responses to low- and high-intensity sounds were significantly smaller at 12 than at 6 months. Limited cross-domain validity was obtained linking large cardiac decelerations, low latencies to reach for toys and high ratings of positive emotionality. These findings are consistent with previous reports documenting relatively greater gains in inhibition than approach during the second half of the first year.	* 139 infants at 6 and 12 months (132 complete sets of data) * Part of larger longitudinal study * Primarily Caucasian	* Two measures of cardiac activity (baseline ECG & cardiac response to white noise tones) * Peek-a-boo game, free play, toy presentation, & gentle arm restraint * Latency to touch toys was coded * Mothers completed the Infant Behavior Questionnaire at both visits

Approach/Avoidance Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Sabol, T.J., & Pianta, R.C. (2012). Recent trends in research on teacher-child relationships. <i>Attachment & Human Development, 14</i> , 213-213.	This paper updates the conceptual framework and continues the necessary integration between disciplines by exploring three areas of research: (1) concordance between children's relationships with teachers and parents; (2) the moderating role of teacher-child relationships for the development of at-risk children; and (3) training teachers from a relational perspective. Each of the three areas of research on teacher-child relationships is examined in light of recent findings and considers implications for understanding the nature and impact of relationships between teachers and children.	* Meta-analysis	* Meta-analysis * Examines three areas: concordance between relationships with teachers and parents; moderating role of teacher-child relationships for at-risk children; and training teachers from a relational perspective

Approach/Avoidance Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Stansbury, K., & Harris, M.L. (2000). Individual differences in stress reactions during a peer entry episode: Effects of age, temperament, approach behavior, and self-perceived peer competence. <i>Journal of Experimental Child Psychology</i> , 76, 50-63.	The purpose of the current study was to determine whether a standardized peer entry paradigm would produce stress responses in 3- and 4-year-olds and how such stress responses would relate to temperament, observed approach to peers, and self-perceived peer competence. Physiological stress reactions were measured by activity of the hypo- thalamic-pituitary-adrenal (HPA) system. The 4-year-old group showed significantly less avoidance of the new peers and was rated higher on approach temperament. This older group also showed larger HPA stress responses to the new peer situation. Finally, discrepancy between self-reported peer competence and behavior in the peer entry situation was associated with larger stress responses on average.	* 63 Euro-Caucasian preschoolers residing in Minneapolis * Age ranged from 36 to 54 months * Sample consisted of 22 three-year-old girls, 16 three-year-old boys, 13 four-year-old girls, and 12 four-year-old boys	* Peer entry paradigm * Child Behavior Questionnaire (to assess temperament) * Pictorial Scale of Perceived Competence & Social Acceptance for preschoolers – peer acceptance subscale * Approach/avoidance behaviors were coded from videotapes of the peer entry paradigm

Approach/Avoidance Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Szewczyk-Sokolowski, M., Bost, K.K., & Wainwright, A.B. (2005). Attachment, temperament, and preschool children's peer acceptance. <i>Social Development, 14</i> , 379-397.	This study examined the relations between preschool children's attachment security, temperament, and peer acceptance. Results revealed significant associations between security and temperament. In addition, both attachment and temperament made significant and unique contributions to peer acceptance whereas temperament was found to be a stronger predictor of children's peer rejection. These findings underscore the dynamic interplay of inter- and intrapersonal factors that influence preschool children's peer relations.	* 98 preschoolers and mothers * Ages 36 to 74 months * Southeast * 78% European American; 20% African American; 2% Asian or Latin	* Waters Attachment Behavior Q-set * Classroom socio-metric data used to measure children's peer acceptance * 2 home visits to assess attachment security * Infant Characteristics Questionnaire – measured temperament

Appendix G

Table 43

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Anthony, L.G., Anthony, B.J., Glanville, D.N., Naiman, D.Q., Waanders, C., & Shaffer, S. (2005). The relationships between parenting stress, parenting behaviour, and preschoolers social competence and behaviour problems in the classroom. <i>Infant and Child Development, 14</i> , 133-154.	<p>This study examined the direct relationship between parenting stress and children's behaviour in two types of preschool programmes: private day care centres and Head Start.</p> <p>Parenting stress was significantly related to teacher ratings of social competence, internalizing behaviours, and externalizing behaviours, and the effects of parenting behaviour do not appear to mediate this relationship. Parenting stress was most strongly related to children's social competence. Parents' reports of expectations for their child's behaviour appear to weakly moderate the relationship between externalizing behaviour and parenting stress.</p>	<p>* 229 children attending 2 Baltimore City Head Start programs & 78 children from 3 private daycare centers in Baltimore & Columbia and their parents & teachers</p> <p>* Age range from 26 to 59 months old (mean 48 months)</p> <p>* Both Head Start programs consisted mostly of low-income African American families; private daycare centers served diverse ethnically & SES backgrounds</p>	<p>* Teachers completed the Social Competence and Behavior Evaluation (SCBE)</p> <p>* Parenting Behaviour Checklist (PBC)</p> <p>* Parenting Stress Index – Short Form (PSI-SF)</p> <p>* Used hierarchical multiple regression analyses</p>

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Gouly, K.K., Brotman, L.M., & Huang, K-Y. (2008). Construct validation of the Social Competence Scale in preschool-age children. <i>Social Development, 17</i> , 380-398.	This study evaluated the utility of the social competence scale (SCS)-parent version, a measure of social competence developed for children of elementary school age, for use with preschool-age children. Using data from both samples, we assessed the factor structure, internal consistency, and stability of the SCS, and whether the SCS discriminated the high-risk sample from the community sample. Results support the utility and construct validity of the SCS for use in preschoolers. The total SCS scale was relatively stable over 24 months during the preschool period and was correlated with other measures of social competence, parent ratings of emotion regulation, lability and behavior problems, and tests of child cognitive ability.	<ul style="list-style-type: none"> * 261 preschoolers in NY – 2 samples (community sample & high risk sample) * Average age was 3.69 years * 52% female * Race approximately 46% African American, 14% Latino, 17% White, 10% Asian, 13% Mixed Ethnicity 	<ul style="list-style-type: none"> * Social Competence Scale (SCS) – 12 item measure * Social Skills Rating Scale – Preschool Version (SSRS) * Emotion Regulation Checklist (ERC) * Penn Interactive Peer Play Scale (PIPPS) * Parent report preschool version of the NYRS (disruptive behavior & peer relationships) * Child Behavior Checklist (CBCL) * Parenting Stress Index – Short Form (PSI-SF) * Differential Abilities Scale (DAS) – cognitive ability

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Griggs, M.S., Gagnon, S.G., Huelsman, T.J., Kidder-Ashley, P., & Ballard, M. (2009). Student-teacher relationships matter: Moderating influences between temperament and preschool social-competence. <i>Psychology in the Schools</i> , 46, 553-567.	This study employs such a model to investigate the interactive influence of child temperament and student-teacher relationship quality on peer play behaviors. Results indicate that (a) student-teacher relationships characterized by low conflict and low dependence are associated with less disruptive peer play, and (b) the association between temperament and disruptive play is attenuated in low conflict student-teacher relationships. Implications for school psychologists include the importance of student-teacher relationships in the context of preschool assessment and intervention planning.	<p>* Part of larger study of 117 preschool children (40 – 68 months olds); primarily White</p> <p>* Part of 19 participating preschool centers in Tennessee or North Carolina</p> <p>* Only 44 matched parent-teacher dyads were included</p> <p>* Age range from 40 to 68 months (mean age 53 months)</p>	<p>* Behavioral Style Questionnaire</p> <p>* Student-Teacher Relationship Scale (STRS)</p> <p>* Penn Interactive Peer Play Scale (PIPPS)</p>

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Gunter, L. Caldarella, P., Korth, B.B., & Young, K.R. (2012). Promoting social and emotional learning in preschool students: A study of Strong-Start pre-K. <i>Journal of Early Childhood Education, 40</i> , 151-159.	This study evaluated the effects of a Social Emotional Learning (SEL) curriculum, Strong Start Pre-K, on the social and emotional competence of 52 preschool students using a quasi-experimental, non-equivalent control group design. Teachers rated students' emotional regulation, internalizing behaviors, and the quality of the student-teacher relationship. Results indicated significant decrease of internalizing behaviors and more improvement in the student-teacher relationship in the treatment conditions. Results also supported the use of the optional booster lessons contained in the curriculum. Treatment integrity and social validity ratings of Strong Start Pre-K were high.	* Teachers & students from Title 1 preschool in Utah * 52 preschoolers completed the study * 66% Hispanic, 26% Caucasian, 3% Mixed Ethnicity, 2% African American, 1% Native American	* All teacher ratings * Preschool Behavioral and Emotional Rating Scale (PreBERS) * Preschool and Kindergarten Behavior Rating Scales, 2 nd Edition (PKBS-2) * Student-Teacher Relationship Scale (STRS)

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Hamre, B.K., Pianta, R.C., Mashburn, A.J., & Downer, J.T. (2012). Promoting young children's social competence through the preschool PATHS curriculum and MyTeachingPartner professional development resources. <i>Early Education and Development, 23</i> , 809-832.	Children's (n = 980) social competence during prekindergarten was assessed as a function of their teachers' (n = 233) exposure to the Preschool Promoting Alternative Thinking Strategies (PATHS) curriculum and 2 levels of support through MyTeachingPartner, a Web-based approach to professional development. Children in classrooms that implemented PATHS had increased levels of teacher-reported social competence over the course of the year. There were no associations between the use of PATHS and reductions in teacher-reported social problems. The results also suggested that teachers who used the MyTeachingPartner website more often reported greater gains in children's social competence.	* 980 preschoolers * 233 preschool teachers	* PATHS curriculum * MyTeachingPartner web program

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
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</i> , 40, 947-959.	The present study examined the factor structure, internal consistency, and construct validity of the parent version of the Social Competence and Behavior Evaluation-30 for preschoolers (SCBE-30; LaFreniere, P. J. (1990). Social competence and behavior evaluation-30. Principal components analysis was used to identify the factor structure of the parent version of the SCBE-30 (N=218 preschool children). To assess construct validity, a compliance task was utilized to determine whether children identified as high on anxiety/withdrawal, anger/aggression, or social competence with the parent version of the SCBE-30 (n=20 for each group) could be distinguished behaviorally on several observational variables.	* 218 preschoolers * Principal components analysis of SCBE-30 parent version	* SCBE-30 * Parent version of SCBE * 3 factor structure: anxiety/withdrawal; anger/aggression; social competence * Results of the current study suggested that the parent version of the SCBE-30 demonstrated both internal consistency and construct validity, and findings paralleled many of the results from LaFreniere and Dumas' validation of the teacher version of the SCBE-30.

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
LaFreniere, P.J., & Dumas, J.E. (1996). Social competence and behavior evaluation in children ages 3 to 6 years: The short form (SCBE-30). <i>Psychological Assessment</i> , 8, 369-377.	The factor structure and scale characteristics of the shortened version of the Social Competence and Behavior Evaluation Scale (SCBE; P. J. LaFreniere & J. E. Dumas, 1995) are presented for a Quebec sample and 3 U.S. samples, as well as age and gender differences in the prevalence of emotional and behavioral problems and social competence throughout the preschool years. Principal-components analyses identified 3 factors in all 4 samples: social competence (SC): anger-aggression (AA); and anxiety-withdrawal (AW). Each 10-item scale was shown to have high inter-rater and test-retest reliability, internal consistency, and temporal stability over a 6-month period.	<ul style="list-style-type: none"> * Principal components analysis for SCBE for 1 Canadian and 3 US samples * PCA identified 3 factors: Anger-aggression (AA); Anxiety-withdrawal (AW); and Social-competence (SC) * Ages 30 – 78 months 	<ul style="list-style-type: none"> * SCBE * 80 item Likert rating scale * Assesses social competence, emotion regulation & expression, and adjustment difficulties * Typically completed by preschool teachers * Contains 8 scales * Separates behaviors into externalizing & internalizing profiles

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
LaFreniere, P.J., Dumas, J.E., Capuano, F., & Dubeau, D. (1992). Development and validation of the preschool socioaffective profile. <i>Psychological Assessment, 4</i> , 442-450.	An analysis of the Preschool Socioaffective Profile (PSP) using a sample of 608 preschoolers revealed high internal consistency, interrater reliability, and stability for the 8 10-item scales and identified 3 coherent factors representing externalizing and internalizing behavior problems and social competence. Boys scored higher than girls on externalizing measures, but not on internalizing measures, which were largely orthogonal. Using a typological approach, the anxious-withdrawn group was found to be the least interactive with peers; the angry-aggressive group, the most interactive and most rejected; and the competent group, highest in sociometric status. Finally, substantial coherence was reported between laboratory observations of mother-child interaction and PSP classification.	* 608 preschoolers	* Pre-cursor to SCBE (PSP)

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
McCabe, P.C., & Altamura, M. (2011). Empirically valid strategies to improve the social and emotional competence of preschool children. <i>Psychology in the Schools, 48</i> , 513-540.	In this paper, research on the importance of social and emotional competence in young children is reviewed as it relates to immediate and long-term outcomes. Assessments of social and emotional development and behavioral adjustment are briefly reviewed, followed by a review of intervention programs with demonstrated empirical efficacy. Although preliminary evidence supports the utility of these intervention programs, additional research on short- and long-term efficacy is recommended, and more programs designed specifically for early childhood are needed.	* Preschool age	* Meta-analysis

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Rhoades, B.L., Warren, H.K., Domitrovich, C.E., & Greenberg, M.T. (2011). Examining the link between preschool social-emotional and first grade academic achievement: The role of attention skills. <i>Early Childhood Research Quarterly</i> , 26, 182-191.	The present study examines the associations between preschool emotion knowledge, kindergarten attention skills, and first grade academic competence in a sample of mostly disadvantaged children. Results indicate that attention during kindergarten is a significant mediator of this association, even after accounting for the effects of maternal education, family income, and children's age, sex, and receptive vocabulary skills. The findings provide further support for the implementation of preventive curricula that focus on both social and emotional development as well as attentional development as one strategy for improving future academic success in young children.	<ul style="list-style-type: none"> * 341 preschool children * Sampled from an urban school district in Northeastern U.S. over 3 years * Year 1 = 12 classrooms * Year 2 = 24 classrooms * Year 3 = 22 classrooms * Most participants met income eligibility criteria for Headstart * 69% African American; 18% Multiracial; 12% Hispanic; 1% White * Children were approximately 4.5 years old at the start of the study 	<ul style="list-style-type: none"> * Promoting Alternative Thinking Strategies (PATHS curriculum) * Peabody Picture Vocabulary Test, Revised (PPVT-R) * Affect Knowledge Test (AKT) – receptive & expressive identification of emotions portion * Kusche Emotion Inventory (KEI) – recognition of emotional expressions * Emotion Situation Knowledge – knowledge of normal emotional reaction elicited from vignettes * Leiter Revised Attention Sustained Task (Leiter-R AS) * Woodcock-Johnson Tests of Achievement (Letter/Word ID; Applied Problems; Dictation subtests)

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Rich, E.C., Shepherd, E.J., & Nangle, D.W. (2008). Validation of the SSRS-T, preschool level as a measure of positive social behavior and conduct problems. <i>Education and Treatment of Children, 31</i> , 183-202.	Evidence for the validity of the Social Skills Rating System for Teachers, Preschool Level (SSRS-T) as a measure of positive social skills and conduct problems was examined in a sample of Head Start preschoolers. One feature of the study was the comparative analysis of the original published factor structure of the Social Skills Scale (i.e.. Cooperation, Assertion, and Self-Control subscales) versus the factor structure newly derived by Fantuzzo and colleagues (i.e.. Interpersonal Skills, Verbal Assertion, and Self-Control factors). Overall the SSRS-T, Preschool Level appeared to be a time-efficient means of capturing both positive and negative aspects of social behavior in one instrument.	* 82 preschoolers enrolled in 4 Headstart programs * 77 students were Caucasian; 2 were African American; 2 Hispanic; 1 Native American * Age range was 36 to 62 months (M = 48 months)	* Social Skills Rating System – Teacher Form * Child Behavior Checklist Caregiver-Teacher Report Form (Aggressive Behavior subscale) * Preschool Social Behavior Scale – Teacher Form (relational aggression factor) * Sociometric rating scale administered individually to each preschooler * Enactive Social Knowledge Interview (friendliness ratings) – hypothetical social dilemmas and responses acted out with puppets

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Santos, A.J., Peceguina, I., Daniel, J.R., Shin, N., & Vaughn, B.E. (2013). Social competence in preschool children: Replication of results and clarification of a hierarchical measurement model. <i>Social Development</i> , 22, 163-179.	This study tested assumptions and conclusions reached in an earlier confirmatory factor analysis (CFA) study of the social competence (SC) construct for preschool children. Significant sex differences were found for peer acceptance (favoring girls) and for initiating affectively neutral interactions (boys had higher rates), and the sex by sample interaction also was significant for initiating interactions (i.e., effect significant only in the Portuguese sample). In CFAs, the hypothesized structure of SC fits the data and was invariant across sample and age within sample in both measurement and structural tests. The model was invariant at the measurement level for sex within sample tests, but not at the structural level. The results replicate and extend understandings of SC reported in the original study.	<ul style="list-style-type: none"> * 408 children * Ages 3-5 years old * 50% from Portuguese & 50% from American preschools * Both samples were from middle-class SES backgrounds 	<ul style="list-style-type: none"> * Social Competence Assessment: Direct observations; California Child Q-sort (CCQ); & preschool Q-sort (PQ) * Social Motivation & Engagement: classroom observations * Behavioral & Psychological Attribute Profile: CCQ & PQ * Peer Acceptance: sociometric ratings

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Sheridan, S.M., Knoche, L.L., Edwards, C.P., Bovaird, J.A., & Kupzyk, K.A. (2010). Parent engagement and school readiness : Effects of getting ready intervention on preschool children’s social-emotional competencies. <i>Early Education and Development, 21</i> , 125-156.	This study reports the results of a randomized trial of a parent engagement intervention (Getting Ready) designed to facilitate school readiness among disadvantaged preschool children, with a particular focus on social-emotional outcomes. Statistically significant differences were observed between treatment and control participants in the rate of change over a 2-year period on teacher reports for certain interpersonal competencies (i.e., attachment, initiative, and anxiety/withdrawal). Practice or Policy: The intervention appears to be particularly effective at building social-emotional competencies beyond the effects experienced as a function of participation in Heat Start programming alone.	<ul style="list-style-type: none"> * Part of a larger correlational study examining the Getting Ready intervention * 28 Head Start classrooms in a Midwestern state over 4 years in 19 different elementary schools * Children were ages 3 to 5 years old * 220 children; 214 parents; 29 Head Start teachers * 32% White; 17% Black; 25% Hispanic; 3% Native American; and 21% Other Ethnicity * 98% received some form of public assistance 	<ul style="list-style-type: none"> * Devereux Early Childhood Assessment (DECA) * Social Competence and Behavior Evaluation – short form (SCBE-30) * Getting Ready Intervention

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Shin, N., Vaughn, B.E., Kim, M., Krzysik, L., Bost, K.K., McBride, B., Santos, A.J., Peceguina, I., & Coppola, G. (2011). Longitudinal analyses of a hierarchical model of peer social competence for preschool children. <i>Merrill-Palmer Quarterly</i> , 57, 73-103.	Authors tested a hierarchical model in which Social Competence (SC) is assumed to be a second-order latent variable by using longitudinal data (N = 345). They also tested the degree to which peer SC at Time 1 predicted changes in positive adjustment from Time 1 to Time 2, based on teacher and peer ratings. Longitudinal confirmatory factor analyses (CFAs) demonstrated invariance of both the measurement and the structural models across age levels and yielded a cross-time path weight of .74 for the second-order factor. Analyses of latent means suggested significant increases in SC scores from the first year to second year of participation, and longitudinal cases in their second year of participation had higher scores than did age peers who entered the program as older children.	<ul style="list-style-type: none"> * Data was used from 2 different studies * Full sample N = 961 children * Grouped children 36 to 48 months in one group and 48 to 60 months in the other group * 490 children were from NAEYC accredited centers * 471 children were from Head Start programs 	<ul style="list-style-type: none"> * Children were observed across all available day-care program settings (e.g. free play, group activities, meal times, playground, transitions) * Social competence indicators: California Child Q-sort (CCQ); Preschool Q-set (PQ); Bronson's adaptation of a Q-sort; direct observation of initiated interaction and visual attention to peers; 2 sociometric interviews * Positive Adjustment: Asher-type rating scale involving peers rating how much they enjoy playing with each child in his/her class; Teacher rating using the Child Characteristics Questionnaire (ChCQ); Social Competence and Behavior Evaluation Scale-short (SCBE-30)

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Vaughn, B.E., Shin, N., Kim, M., Coppola, G., Krzysik, L., Santos, A.J., Peceguina, I., Daniel, J.R., Verissimo, M., DeVries, A., Elphick, E., Ballentina, X., Bost, K.K., Newell, W.Y., Miller, E.B., Snider, J.B., & Korth, B. (2009). Hierarchical models of social competence in preschool children: A multisite, multinational study. <i>Child Development, 80</i> , 1775-1796.	The generality of a multilevel factorial model of social competence (SC) for preschool children was tested in a 5-group, multinational sample (N = 1,540) using confirmatory factor analysis. The model fits the observed data well, and tests constraining paths for measured variables to their respective first-order factors across samples also fit well. Equivalence of measurement models was found at sample and sex within-sample levels but not for age within sample. In 2 groups, teachers' ratings were examined as correlates of SC indicators. Composites of SC indicators were significantly associated with both positive and negative child attributes from the teachers' ratings. The findings contribute to understanding of both methodological and substantive issues concerning SC in young children.	<ul style="list-style-type: none"> * All samples together have an N = 1,540 * 471 children from Head Start * 476 children from a community sample * 358 children from two NAEYC-accredited centers managed by a major Southeastern university * 111 children from four kindergarten classrooms in the Netherlands * 124 children from community centers in Portugal 	<ul style="list-style-type: none"> * California Child Q-sort (CCQ) * Preschool Q-set (PQ) * Bronson's adaptation of a Q-sort * Direct observations of initiated interaction and visual attention to peers * 2 sociometric interviews * Child Characteristics Questionnaire (ChCQ) * Social Competence and Behavior Evaluation Scale – short (SCBE-30) * Interpersonal Competence Scale (ICS) * Teacher Rating of Social Skills (TRSS) * Social Behavior Scale (SBS)

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Reference	Article Summary	Sample	Measure(s) Cited
Walker, O.L., & Henderson, H.A. (2012). Temperament and social problem solving competence in preschool: Influence on academic skills in early elementary school. <i>Social Development, 21</i> , 761-779.	The goals of the current study were to examine whether children’s social problem solving (SPS) skills are a mechanism through which temperament influences later academic achievement and whether sex moderates these associations. The results indicated that high ratings of inhibitory control in preschool, but not shyness, predicted better kindergarten and first-grade academic skills. Furthermore, children’s SPS competence mediated the relations between both shyness and inhibitory control on later academic skills. The child’s sex did not moderate these associations. The results suggest that preventative efforts targeting early SPS skills may buffer against later academic adjustment problems among temperamentally extreme children.	<ul style="list-style-type: none"> * 1117 children from NICHD SECCYD * Longitudinal study from birth to 15 years old * Phase II data from preschool & 1st grade used for current study * 82% White, 12% African American, 1% Asian, less than 1% American Indian, 4% Other. 	<ul style="list-style-type: none"> * Children’s Behavior Questionnaire (CBQ) – caregiver report * Social Problem Solving Test – Revised at 54 month lab visit * Academic Rating Scale - Teacher ratings of math thinking and language and literacy skills * T-tests & SEM used for analyses

Social Competence Literature Review

Reference	Article Summary	Sample	Measure(s) Cited
Ziv, Y. (2013). Social information processing patterns, social skills, and school readiness in preschool children. <i>Journal of Experimental Child Psychology</i> , 113, 306-320.	The links among social information processing, social competence, and school readiness were examined in this short-term longitudinal study with a sample of 198 preschool children. Findings provided support for our hypothesis that both social information processing and social competence are related to school readiness. Social competence also partially mediated the link between social information processing and school readiness, thereby supporting our hypothesis about an indirect path in which mental processes are translated into social skills and then translated into school readiness.	* 198 preschool age children * 48 to 61 months (mean age 55 months) * Some recruitment through local Head Start programs for SES diversity * 47% White; 25% Black; 19% Asian; 8% Latino	* Social Information Processing Interview – Preschool Version (SIPI-P): child assessment * Teacher Assessments: competent social behavior scale & problem behavior scale from the Personal Maturity Scale; Social Skills Rating System; Child Behavior Checklist; & Problem Behavior Index * School Readiness: Picture Vocabulary from WJ-III; Preschool Learning Behavior Scale * Used SEM analyses

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