DOES CHILD TEMPERAMENT PREDICT STUDENT-TEACHER RELATIONSHIP
QUALITY?

A Thesis
by
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FOREWORD

This thesis is written in accordance with the style of the *Publication Manual of the American Psychological Association (5th Edition)* as required by the Department of Psychology at Appalachian State University

Author note

I would like to thank my thesis chair, Sandra G. Gagnon, for her patience and guidance during this thesis process. Special thanks to the rest of my thesis committee, Dr. Pamela Kidder-Ashley, Dr. Amy Galloway, and Dr. Timothy Huelsman for all of your advice, time, and feedback. Finally, I would like to dedicate this thesis to my parents, Cathy and Mike Holt. I am forever indebted for all of the love and support they have provided me throughout my education.

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Abstract

A wealth of evidence attests to the critical role that student-teacher relationships play in a variety of developmental outcomes for children. These relationships are complex and multifaceted, influenced by factors both within and external to the child. The current study examines the relationships between child temperament and student-teacher relationship quality in a sample of 47 preschool children. Parents provided ratings of their preschool children's temperaments on the Behavioral Style Questionnaire. Teachers reported their perceptions of the quality of the relationships they experienced with students on the Student-Teacher Relationship Scale. It was expected that various individual and combined child temperament traits would predict student-teacher relationship quality. Results of multiple regression analysis generally did not support the hypothesis, although there was some support for an association between the interaction between two clusters of temperament traits – *Social Response/ Mood* (Mood, Adaptability, Approach) and *Stimulation/ Energy* (Threshold of Responses, Intensity of Responses, and Distractibility) – and Closeness in the student-teacher relationship. The results provide support for existing literature that questions the role of temperament in attachment and subsequent adult-child relationships. The findings indicate the need to assume a multifaceted, ecological approach to understanding the variables that predict student-teacher relationship quality, which considers the contributions of environmental variables, as well as the interactions between various within-child and environmental variables.

Does Child Temperament Predict Student-Teacher Relationship Quality?

From the beginning of life, the relationships children form with adults make substantial contributions to child development. Parent-child relationships provide the foundation for children's subsequent relationships with others, such as peers and teachers, and these relationships continue to influence children's development of social, cognitive, emotional, and behavioral competencies. It is well established that a close relationship between an adult and child promotes emotional development and self-regulation (Denham & Burton, 1996), social relationships with peers (Elicker, Egeland, & Sroufe, 1992; Griggs, Gagnon, Huelsman, Kidder-Ashley, & Ballard, 2009), and academic competencies, such as motivation, concentration, problem solving, and self-esteem (Birch & Ladd, 1997; Pianta & Harbers, 1996). Although much more is known about the roles parent-child relationships play in children's development, a considerable body of research indicates that student-teacher relationships also make substantial contributions to the development of academic, social, and behavioral skills (Birch & Ladd, 1997; Denham & Burton, 1996; Elicker et al., 1992; Griggs et al., 2009; Pianta & Harbers, 1996). It also is known that the relationships between children and adults are complex and are influenced by a variety of factors, including individual biological traits, such as intelligence and temperament, environmental variables, such as rules and parenting behaviors, and interactive behaviors and communication. The present study will examine the influence of an individual characteristic, child temperament, on student-teacher relationship quality, with the goal of identifying specific traits, or combinations of traits, that may affect the nature of the relationship. Given the important influence these relationships have on a number of child outcomes, identifying traits that may either promote

or compromise the relationship may allow for early identification of children who may be at risk for experiencing difficulties with academic, social, and behavioral functioning.

Student-Teacher Relationships

Existing conceptualizations of student-teacher relationships have been guided by well established theories of adult-child relationships. John Bowlby (1969), one of the best known theorists in this area, proposed that individuals have a set of rules, or a model, for behaviors that is based on previous and current relational experiences. This "internal working model" or "representational model" includes feelings, memories, beliefs, and experiences that have the potential to influence the expectations a person has about new relationships (Pianta, 1999). These expectations are closely linked to individuals' tolerances for certain types of interactions and behaviors.

Bronfenbrenner's General Systems Theory (GST; 1979) also provides a useful framework from which to conceptualize student-teacher relationships. This theory suggests that distal (governments, etc.) and proximal (families, teachers, etc.) influences within a child's system constantly interact with and influence his or her social development. GST has been used to explain research findings that suggest the relationship between a child and his or her teacher stabilizes the child's experiences in the classroom, provides structure and rules for peer interactions, serves as a source of security that supports the child's exploration and mastery of skills, and provides interactions that help shape the child's self-regulation (Pianta, 1999).

As is the case with all relationships between children and adults, student-teacher relationships vary in quality and character (Pianta, 2001). Pianta (2001) developed a well regarded conceptualization of student-teacher relationships that was influenced by the

assertions of previous researchers. Howes and Matheson (1992) proposed that teacher-child relationships could be characterized as close and affectionate, distant and formal, or conflictual. Birch and Ladd (1997) suggested that children possess styles of interpersonal interactions, termed *moving toward*, *moving against*, and *moving away,* that generalize to their teachers and peers.

Following these ideas, Pianta (1994) analyzed teachers' perceptions of their relationships with students and identified six classifications of relationships: *dependent*, characterized by excessive reliance on the teacher; *positively involved* (warmth and good communication), *dysfunctional* (low levels of involvement and high levels of anger and annoyance), *average-functional, angry,* (highly conflictual), and *uninvolved* (low warmth, low communication, and anger). Building on this preliminary work, Pianta (2001) refined these categories and described three types of general relationships: *conflictual, close,* and *dependent*. A relationship high in conflict is characterized by teacher reports of struggling with the student, perceiving the student as angry and unpredictable, and feeling emotionally drained and ineffective. Close relationships are characterized by affectionate, warm, and open interactions and communication. The teacher feels effective because the student uses him or her as a support. Dependent relationships are characterized by the student's overreliance on the teacher. The student reacts strongly to separation from the teacher and requests assistance when it is not needed. These behaviors lead the teacher to have concerns about the student's dependence. Pianta's (2001) conceptualization of student-teacher relationships is empirically supported, with many studies utilizing his model.

A substantial literature provides evidence for the influential role student-teacher relationships play in a variety of important social, behavioral, and academic child outcomes.

In general, close relationships characterized by warmth, support, and trust tend to predict positive child outcomes, whereas negative relationships, typified by conflict and/or dependency, are more apt to be associated with less optimal consequences (Hamre & Pianta, 2006).

Extensive empirical findings provide evidence of the benefits that close or secure student-teacher relationships have for children's development and performance. These empirical findings also provide insight about other academic-related competencies as well. Close relationships have predicted overall academic performance (Birch & Ladd, 1997; Pianta, Nimetz, & Bennett, 1997), math and reading achievement (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002), language abilities for children from minority backgrounds, and reading skills for children whose parents use authoritarian parenting styles and who may consequently be at risk for a variety of difficulties (Burchinal et al. , 2002). Close relationships also are significantly associated with children's work styles, including self-direction and responsibility (Birch & Ladd, 1997), work habits and frustration tolerance (Pianta et al., 1997), task accuracy (Liew, Chen, & Hughes, 2010), and classroom participation (Ladd, Birch, & Buhs, 1999). Finally, close relationships predict children's adjustment and adaptation to the school setting (Pianta et al., 1997; Pianta, Steinberg, & Rollins, 1995), attitudes toward school, and engagement in the school environment (Birch & Ladd, 1997).

In addition to predicting academic-related outcomes, close student-teacher relationships have been associated with a number of social competencies. For example, young children's relationships with their teachers predict their ability to form and maintain positive relationships with other adults and peers (Birch & Ladd, 1998). Secure student-

teacher relationships, manifested in children's feelings of confidence to move around their environments and seek assistance from their teachers when it is needed, have positively predicted prosocial, extroverted and complex play, and negatively predicted aggressive and withdrawn behaviors during preschool (Howes, Hamilton, & Matheson, 1994). Warm, close, communicative relationships between students and their kindergarten teachers have predicted better adjustment in kindergarten and subsequent positive teacher-child interactions during second grade (Pianta et al., 1995).

In contrast, dependent and conflictual relationships have been linked to various negative academic and behavioral outcomes, including lower standardized test scores in math and reading, fewer positive work habits, frequent disciplinary problems (Hamre & Pianta, 2001), school avoidance (Birch & Ladd, 1997), behavioral problems (Pianta et al., 1995), and psychological and school adjustment difficulties (Ladd & Burgess, 2001; Pianta et al., 1997; Pianta et al., 1995). Children described by their teachers as dependent tend to achieve at lower levels, display negative attitudes about school, engage less in the school environment (Birch & Ladd, 1997), and exhibit inappropriate behaviors in the classroom (Pianta & Nimetz, 1991). Over-reliance on the teacher may signify that a child is not mature enough to navigate the school environment (Birch & Ladd, 1997). Children in conflictual relationships may be reluctant to engage in the school environment and may display fewer socially competent behaviors (Birch & Ladd, 1997). Additionally, less closeness in the relationships has been associated with increased maternal reports of internalizing behaviors (Birch & Ladd, 1997). Finally, the degree of conflict in student-teacher relationships has been associated with teachers' negative predictions of their students' levels of achievement (Pianta & Stuhlman, 2004).

The literature reviewed presents a clear case for the importance of student-teacher relationship quality for numerous child behaviors and competencies. With this information in mind, researchers have a rationale for examining specific variables that may influence the nature of the student-teacher relationship. Temperament is one such factor that is evaluated in the current study, in terms of its possible contributions to the student-teacher relationship.

Temperament

Temperament, or behavioral style, reflects individuals' experiences of and reactions to the surrounding environment (Carey, 1998). Although researchers have proposed many definitions of temperament, most consider it to be an innate, stylistic trait that is present at birth (Buss & Plomin, 1975; Goldsmith, 1987; Keogh, 2003; Kristal, 2005; Rothbart, 1989). Buss and Plomin (1975) described temperament as "broad inherited tendencies" (p. 5) in the areas of emotionality, activity, and sociability. Goldsmith (1987) suggested that temperament reflects differences in individuals' experiences and expressions of primary emotions. From this theoretical view, temperament is labeled "emotionality" (Goldsmith, 1987; Keogh, 2003; Kristal, 2005). Rothbart (1989) conceptualized temperament in terms of self-regulation and reaction.

The current study is based on the work of Thomas, Chess, and Birch (1968), who identified nine domains of temperament: activity, rhythmicity, approach/withdrawal, adaptability, intensity of reaction, threshold of responsiveness, quality of mood, distractibility, and attention span/persistence (See Table 1 for definitions of each dimension). Thomas and colleagues (1968) based their conceptualization of temperament on data derived from their classic New York Longitudinal Study (NYLS), a systematic examination of individual differences in children based on parent interviews and observations. Thomas and

colleagues (1968) observed differences in infants' behaviors across the nine dimensions and noted that these differences persisted through childhood and adolescence.

Based on their observations, Thomas et al. (1968) identified three constellations of temperament patterns, which they labeled *easy, difficult,* and *slow-to-warm*, comprising five of the nine traits – rhythmicity, approach, adaptability, intensity, and mood. Children classified as easy were characterized by a positive mood, regular biological functioning, low to mild intensity of reactions, easy adaptability, and a positive approach to new situations (Keogh, 2003; Kristal, 2005; Thomas et al., 1968). Children categorized as difficult showed irregular biological functioning, negative reactions or withdrawal in response to new stimuli, slow adaptation to changing environments, expression of negative moods, and a tendency to have intense reactions (Keogh, 2003; Kristal, 2005; Thomas et al., 1968). Children whose temperament patterns fit into the slow-to-warm category typically demonstrated low levels of activity, initial withdrawal responses to new stimuli, less intense reactions, slow adaptability to change in the environment, and relatively higher frequencies of negative mood. According to Thomas and colleagues, 65% of children in their sample fit into one of the three constellations and 35% of all children may show a combination of characteristics from more than one category (Keogh, 2003; Kristal, 2005; Thomas & Chess, 1996).

There is substantial empirical evidence for a child's preschool temperament as a predictive power for his/her academic, social, and behavioral development. Temperament has been found to predict academic skills and performance (Coplan, Barber, & Lagacé-Séguin, 1999; DiLalla, Marcus, Wright-Phillips, 2004; Martin, Gaddis, Drew, & Moseley, 1988; Stright, Gallagher, & Kelly, 2008), school adjustment (Nelson, Martin, Hodge, Havill, & Kamphaus, 1999), degree of compliance with requests (Wachs, Gurkas, & Kontos, 2004),

and student-teacher relationship quality (Rudasill, Rimm-Kaufman, Justice, & Pence, 2006; Rudasill & Rimm-Kaufman, 2009; Stright et al., 2008). Specific aspects of child temperament have been linked with various outcomes. For example, high threshold of responsiveness and high activity have predicted difficulties with school adjustment, and low persistence and high withdrawal have predicted anxiety in the school setting (Klein, 1982).

Temperament also predicts prosocial behaviors (Diener & Kim, 2004; DiLalla, 1998), social skills (Stright et al., 2008), and social competence (Griggs et al., 2009). Rudasill and Konold (2008) found that preschool children rated by their teachers as "shy," (behaviorally inhibited), were rated as more cooperative and as exhibiting more self-control in Kindergarten, whereas Kindergarten teachers tended to rate children as more assertive if they were characterized as "less shy" or "bold" children (those more likely to join immediately in on activities), in preschool. However, shy children with more focused attention were rated as more assertive in Kindergarten. Although "shy" and "bold" children exhibited behavioral differences, both were considered by their teachers to be socially competent. Contrasting evidence is provided by Rudasill and colleagues (2006), who found "boldness" to be associated with classroom disruptive behaviors.

Research by Rudasill and colleagues (Rudasill & Konold, 2008; Rudasill et al., 2006) provides an impetus for the current study, in that the findings demonstrate differences in the ways in which similar behavioral characteristics, or temperament traits, may play out differently in various settings. For example, in the first study, children described as "bold" were viewed by their teachers as socially competent, whereas in the second study, "bold" children tended to be perceived as displaying behavioral difficulties. The goal of the current study is to identify temperament traits that will predict the quality of the student-teacher

relationship. Previous research suggests that certain traits may elicit different perceptions from teachers, and that teachers' perceptions of their students' innate characteristics may influence the interactions they experience (Buss, Gingles, & Price, 1993; Stright et al., 2008). Temperament has predicted not only various child outcomes, but also teacher characteristics that contribute to such outcomes, such as attitudes, decisions, and behaviors toward children (Martin, 1992).

The Current Study: Temperament and Student-Teacher Relationships

In light of the extant literature attesting to the associations between student-teacher relationships and numerous outcomes for children, the identification of student characteristics (e.g., temperament) that may influence those relationships seems important. If teachers can be made aware that children who exhibit particular temperament traits may present challenges that could potentially compromise the relationships they are developing with their students, they may be able to adjust their perceptions of and responses to those children in order to promote a close relationship. In other words, teachers may have to work harder in order to establish close relationships with some of their students.

A wealth of literature provides support for associations between both overall temperament (e.g., easy/difficult) and specific temperament traits (e.g., activity, persistence) and student-teacher relationships (Rudasill et al., 2006; Rudasill & Rimm-Kaufman, 2009; Stright at al., 2008). Although it is helpful to identify these trends with respect to general temperament styles, the examination of specific traits appears to be more useful in terms of understanding children's unique characteristics and developing specific strategies to promote positive experiences for them and for their teachers.

Guerin, Gottfried, Oliver, and Thomas (1994) found that predictability, adaptability, and quality of mood predicted teacher ratings of relationship quality and perceptions of classroom behaviors, such as working hard and displaying appropriate behaviors. Effortful control, or the ability to focus attention and inhibit behaviors (similar to Thomas et al.'s 1968 conceptualization of attention span and persistence), has demonstrated associations with conflict in the student-teacher relationship (Rudasill & Konold, 2008) and, when combined with shyness, has predicted relationship conflict and increased teacher-initiated interactions (Rudasill & Rimm-Kaufman, 2009), with differences observed between boys and girls. Koles, O'Conner, and McCartney (2007) found that preschoolers' shyness predicted closeness in the student-teacher relationship, again, with differences observed between genders. For example, in boys, increased shyness predicted closer relationships, whereas for girls, higher levels of shyness were associated with less close relationships. These gender differences demonstrate the complex and multifaceted nature of these relationships.

Shyness has been examined in other studies. Rudasill and Rimm-Kaufman (2009) found that lower levels of shyness predicted higher levels of student-teacher conflict, as children in their sample who were less shy engaged in more disruptive behaviors and consequently required the teacher's attention. Also, shy children were less likely to initiate interactions with teachers or to have close relationships with them. Rudasill et al. (2006) found that, in contrast to "shy" children, children with poor language skills who were described as "bold" tended to experience conflictual relationships with their teachers.

Combinations of temperament traits have been linked to student-teacher relationship quality. For example, task-orientation (combined activity, persistence, and distractibility), personal-social flexibility (combined adaptability, approach/withdrawal and positive mood),

and reactivity (combined threshold of response, intensity, and negative mood) predicted the frequency of interactions between teachers and their preschool students with and without disabilities (Keogh & Burstein, 1988). As was the case with gender, mentioned previously, differences emerged according to disability status. For the children with disabilities, teachers interacted more frequently with those who displayed more negative temperament patterns, whereas for the children without disabilities, they interacted more with those who displayed more positive temperament patterns. Again, these findings highlight the multifaceted nature of student-teacher relationships by identifying an additional individual difference trait – disability status – that influences these relationships.

Contradictory to the previous research discussed, Sroufe (1985) investigated differing conceptualizations of Ainsworth and Wittig's (1969) Strange Situation procedure to explain infant attachment. Specifically, Sroufe (1985) critically evaluated research investigating the impact of temperamental variations on related elements of attachment, relationship history of a child, and the impact child temperament may have on caregiver's responses. Also, interaction models between relationship and temperament were investigated. Sroufe (1985) concluded that a child's behaviors are of little relevance to attachment; rather it is the appropriateness of the caregiver's responsiveness to the child and the nature of the child's responses to a caregiver that provide information about the quality of attachment. Sroufe (1985) further cautions that attachment and temperament are such divergent concepts that meaningful conclusions may not be appropriately derived from the studies he evaluated.

The previous research indicates that child temperament makes significant contributions to the relationships that develop between teachers and students, and that these relationships serve many important purposes for children. However, contrasting literature

(Sroufe, 1985) also suggests that temperament may not significantly impact relations between children and adults. Further investigation is warranted in order to understand better the role child temperament plays in the quality of adult-child relationships, specifically in the relationships between teachers and students. Some researchers have examined temperament in a global manner, on a continuum from "easy" to "difficult," whereas others have identified specific temperament traits that predict relationship quality. The current study continues the latter line of research, examining the associations between several individual and combined temperament traits and student-teacher relationship quality. The identification of specific temperament characteristics that may influence these important relationships and subsequent developmental outcomes will not only further inform our understanding of these constructs, but also may inform practice.

Research Questions/Hypotheses

The primary question addressed by this research is, "Does child temperament predict the quality of the student-teacher relationship?" Several dimensions of temperament were selected from the nine identified by Thomas, Chess, and Birch (1968). A factor analysis was performed in order to identify related temperamental traits to be utilized as predictors. Student-teacher relationship quality was measured in terms of the three categories conceptualized by Pianta (2001) – close, conflictual, and dependent. Hierarchical multiple regression analyses were performed with the temperament factors and their interactions as predictor variables, and student-teacher relationship quality as the outcome variable.

It was hypothesized that the temperament traits identified through the factor analyses would predict student-teacher relationship quality. This study is exploratory in nature, thus specific hypotheses about temperament predicted qualities of relationships were not made. It

was generally hypothesized that "positive" characteristics (i.e., positive mood, readily adapts to changes, laughing at a new stimuli) would significantly predict close relationships and "negative" traits (i.e., low threshold of environmental stimuli, very intense reactions to stimuli, and high distractibility) would predict conflictual and dependent relationships.

Method

Procedure

The current sample was selected from a larger sample of 117 children attending preschools and daycare centers in both urban and rural areas in Tennessee and North Carolina. Twenty early childhood centers were recruited for participation, using the North Carolina Division of Child Development website (http://ncchildcare.dhhs.state.nc.us/general/home.asp) and personal contacts with directors and teachers at centers in Tennessee.

Directors of the childhood centers were contacted by phone regarding participation. Nineteen of the 20 directors agreed to participate. Upon verbal agreement, written consent was first obtained from the preschool directors in order to recruit parents and teachers. Informed consent forms (see Appendix A) were mailed to the centers to be distributed to the teachers of children from ages 3 to 5 years. The teachers then sent the forms home to parents. Both parents and teachers returned the consent forms to the researchers in self-addressed, stamped envelopes. Once the researchers received informed consent, packets of questionnaires were compiled in counterbalanced order using a Latin Square algorithm and then mailed to the teachers, who then sent the questionnaire packets home to parents. After the parents and teachers completed the questionnaires, they returned them to the researchers in self-addressed, stamped envelopes. A small monetary compensation was provided for the

participants for each child they rated from funds granted by Appalachian State University's
University Research Council. Institutional Approval for this study was granted on May 6,
2009 (see Appendix B).

Measures

Behavioral Style Questionnaire (BSQ). The BSQ (McDevitt & Carey, 1978) is a 110-
item caregiver rating scale designed to measure specific behaviors related to the nine
dimensions of temperament identified by Thomas, Chess, and Birch (1968) in children ages 3
to 7 years. The BSQ was normed on 350 children from families who were primarily middle
class Euro-Americans living in the United States. The nine subscales of the BSQ (activity
level, rhythmicity, approach-withdrawal, adaptability, intensity, mood, attention
span/persistence, distractibility, and sensory threshold) are aligned with Thomas and
colleagues' (1968) model of temperament described previously (See Table 1). To complete
the first 100 items on the BSQ, the caregiver rates the frequency of behaviors observed in his
or her child on a 6-point Likert scale, with responses ranging from 1 ("Almost Never") to 6
("Almost Always"). For the next nine 9 items, raters provide a general impression of each of
the nine dimensions of temperament. On the final item, the rater indicates his or her
perceptions of the overall manageability of the child. For the current study, category scores
for individual subscales, which are mean scores, will be utilized.

The Activity subscale comprises 13 items that assess the child's level of activity,
including physical motion during sleep, eating, play, dressing, and other daily activities. A
high score indicates a higher activity level. The Adaptability subscale includes 12 items that
measure the ease with which a child's reaction to stimuli can be redirected or changed in a
desired way, with high scores indicating that a child is slow to adapt. The

Approach/Withdrawal subscale consists of 11 items that measure the nature of the child's

initial response to new people, situations, foods, and other stimuli. A higher score reflects

more withdrawal. The Mood subscale is made up of 12 items that assess the degree of

friendliness and positive behaviors typically displayed in various situations, with high scores

indicating a more negative mood. The Intensity subscale consists of 12 items that measure

the strength of emotional responses. A high score indicates high intensity. The Distractibility

scale includes 10 items that assess the extent to which interruptions in the environment

influence ongoing behavior, with high scores reflecting high distractibility. The

Persistence/Attention Span subscale is made up of 10 items that measure the length of time

an activity is pursued by a child, with or without obstacles. High scores indicate low

persistence. The Sensory Threshold subscale comprises 11 items that assess the amount of

sensory stimulation (i.e., visual, auditory, tactile, or olfactory,) needed to evoke discernable

responses from the child. High scores indicate that a child is overly sensitive to sensory

stimuli. The Rhythmicity subscale includes nine items that measure the consistency of a

child's daily biological functions, with high scores indicating that a child is arrhythmic.

Test-retest reliability and internal consistency (alpha) estimates provide support for

the BSQ's reliability. Test-retest reliability coefficients ranged from .67 (Threshold) to .94

(Rhythmicity), with a median score of .81. Alpha reliabilities ranged from .47 to .80 with a

median score of .70. Substantial evidence for the validity of the BSQ has been provided by

studies that have examined the relationships between temperament and clinical diagnoses and

other measures (Carey & McDevitt, 2000).

Student Teacher Relationship Scale (STRS). The STRS (Pianta, 2001) is a 28-item

self-report instrument that assesses a teacher's perception of his or her relationship with a

student, based on the types of behaviors the child exhibits when interacting with the teacher and the teacher's beliefs about how the student feels toward him or her. To complete the STRS, teachers rate items on a 5-point Likert-type rating scale, with responses ranging from 1 ("Definitely Does Not Apply") to 5 ("Definitely Applies").

The STRS was normed on 275 teacher respondents, all of whom were females teaching in preschool through third-grade classrooms. The normative sample included teachers of Caucasian (70%), African American (10%), and Hispanic American (10%) ethnic groups, with 5% from "Other" ethnic backgrounds. The student sample consisted of 1,535 children between the ages of 4 years, 1 month and 8 years, 8 months ($M = 5$). Fifty-three percent of the students rated were male and 47% were female. Sixty-three percent of the student sample was Caucasian, 18% African American, 10% Hispanic American, 1.7% Asian American, and 7% was from another ethnic background or did not report their race/ethnicity.

The STRS provides three subscale scores (Conflict, Closeness, and Dependency) and a Total Scale score. The Conflict subscale, made up of 13 items, measures the degree to which a teacher perceives his or her relationship with a specific student as negative and conflictual. High scores on this scale suggest that the teacher perceives the student as angry or unpredictable and that he or she may struggle with the student, consequently feeling emotionally drained and ineffective with regard to that particular student. The Closeness subscale, made up of 11 items, measures the degree to which a teacher experiences affection, warmth, and open communication with a specific student. High scores on this scale indicate the perception that the student effectively uses the teacher as a resource, views the teacher as supportive, and demonstrates positive overall well-being. The Dependency subscale, made up of 5 items, measures the degree to which a teacher perceives a particular student's

overreliance on him or her, as well as the student's strong reactions to separation from the teacher and frequent requests for help when it is not needed. The Total Scale measures the teacher's perceptions of the overall quality of the relationship with the student. Higher Total Scale scores indicate a more positive and effective relationship, with high levels of closeness and low levels of conflict and dependency. The current study will use raw scores from the Conflict, Dependency, and Closeness subscales to measure the relationships between the teachers and children.

Test-retest reliability coefficients for the three subscales and the total scale were all significant and ranged from $r = .76$ to $r = .92$. Internal consistency coefficients ranged from .64 (Dependency) to .92 (Conflict) for the overall sample, although there was some variance among ethnic groups and gender. Pearson product-moment correlations were computed among the subscales and between each of the subscales and the Total Scale score to measure the construct validity of the STRS. The correlations were all statistically significant and ranged from $r = .125$ (Closeness and Dependency) to $r = .913$ (between Conflict and the Total). The weak correlation between the Closeness and Dependency scale may be due to the small number of items that make up the Dependency scale. Additional validity evidence is provided by studies reporting that the STRS correlates in the predicted directions with concurrent and subsequent measures of academic performance and performance on standardized tests (Hamre & Pianta, 2001), peer relations (Birch & Ladd, 1998), and behavioral competencies and difficulties in elementary school (Pianta, 1994; Pianta et al., 1995). Many investigations have demonstrated that the STRS does not overlap with other teacher ratings of problem behavior or social competence in the classroom, providing evidence of discriminate validity (Birch & Ladd, 1997, 1998; Howes et al., 1994).

Results

Identification of Temperament Factors

Following Keogh & Burstein's (1988) analyses as an example, a second order principal components analysis with Oblimin rotation ($\delta = 0$) was performed to reduce the number of temperament scales used as predictors in the current study. Using the 47 participants for whom complete data were available, three components were extracted from the nine temperaments items. Loadings of variables on components, communalities, and percents of variance are shown in Table 2. These three components (Social Response and Mood, Stimulation and Energy, and Task Orientation and Rhythmicity) will be used as predictors for the current sample of preschoolers in the hierarchical multiple regressions that follow.

The labels for the three components that emerged from the factor analyses were derived by examining the definitions of the temperament traits each component comprised as well as the BSQ items that make up each of the subscales/domains. Social Response and Mood reflects the level of friendly behavior and pleasantness a child exhibits, the way in which a child responds to new stimuli, and the way a child responds and adapts to changes in his/her environment. The Stimulation and Energy component represents the energy level of a child's responses when hurt, frustrated, or feeling bad; the ease with which a child is affected by stimuli in his/her environment; and the level of intensity needed from an outside stimulus to evoke a response (e.g. does the child look up when the phone rings or is the child's behavior disrupted when there is thunder outside). The Task Orientation and Rhythmicity component reflects a child's ability to continue an activity when faced with an obstacle, the

predictability of a child's bodily functions, and the level of activity a child exhibits in everyday life.

Descriptive Statistics

Descriptive statistics are presented in Table 3. Means of the current sample for the STRS scales were different from the normative sample. Specifically, the current sample had less conflict ($M_{sample} = 19.17$, $M_{norm} = 24.40$; $t_{47} = -4.08$, $p < .001$) and greater closeness ($M_{sample} = 45.79$, $M_{norm} = 42.01$; $t_{47} = 4.20$, $p < .001$) than the normative sample reported by Pianta (2001). There was no difference between the two samples on dependency.

Due to the use of component scores for temperament, comparisons of BSQ means for the current sample and standardization sample are less relevant. It should be noted, however, that the current sample has higher levels of rhythmicity ($M_{sample} = 3.09$, $M_{norm} = 2.75$; $t_{47} = 3.90$, $p < .001$) and approach ($M_{sample} = 3.21$, $M_{norm} = 2.99$; $t_{47} = 2.21$, $p = .032$), and lower levels of intensity ($M_{sample} = 4.21$, $M_{norm} = 4.52$; $t_{47} = -3.84$, $p < .001$) and threshold ($M_{sample} = 3.67$, $M_{norm} = 3.98$; $t_{47} = -3.29$, $p = .002$) than those of the standardization sample reported by McDevitt and Carey (1978). There were no differences on the other BSQ scales.

Pearson product-moment correlations and Cronbach's alphas are presented in Table 3. Pearson product-moment correlations indicate that there were no significant relationships between the independent components and the relationship scale scores. The correlations found among the components and the relationship quality scale scores were weak (ranging from $r = -.20$ to $r = .29$). However, the interaction between the Social Response/Mood and the Stimulation/ Energy components did yield some significant correlations. This interaction significantly correlated ($r = .44$, $p < .01$) with closeness in the student-teacher relationship. The interaction between the Social Response/Mood component and the Stimulation/Energy

component was also significantly correlated ($r = .35$, $p < .05$) with dependency in the student-teacher relationship.

Tests of the Hypotheses (Hierarchical Multiple Regression Analyses)

To test the study hypotheses, hierarchical multiple regression analyses were performed. In separate regressions, a single student-teacher relationship scale (Closeness, Conflict, or Dependency) was regressed on the three composite temperament variables (that resulted from the principal components analysis: Social Response and Mood, Stimulation and Energy, and Task Orientation and Rhythmicity) in Step 1, with the four interactions among the temperament composites added to the model in Step 2 (predictors were centered before creating the interaction variables). Thus, a total of three hierarchical multiple regressions were performed. The results of these analyses are presented in Table 4.

None of the three multiple regressions allowed for the prediction of any of the study's criterion variables. When regressing Closeness in the student-teacher relationship on the temperament variables, neither Step 1 ($\Delta R^2 = .02$, $\Delta F_{(3, 43)} = 0.29$, $p = .84$), Step 2 ($\Delta R^2 = .19$, $\Delta F_{(4, 39)} = 2.31$, $p = .08$), nor the full model ($R^2 = .21$, $F_{(7, 39)} = 1.46$, $p = .21$) was statistically significant. Similarly, when regressing Conflict in the student-teacher relationship on the temperament variables, neither Step 1 ($\Delta R^2 = .09$, $\Delta F_{(3, 40)} = 1.35$, $p = .27$), Step 2 ($\Delta R^2 = .04$, $\Delta F_{(4, 36)} = 0.38$, $p = .82$), nor the full model ($R^2 = .13$, $F_{(7, 36)} = 1.36$, $p = .27$) was statistically significant. Finally, when regressing Dependency in the student-teacher relationship on the temperament variables, neither Step 1 ($\Delta R^2 = .04$, $\Delta F_{(3, 43)} = 0.64$, $p = .60$), Step 2 ($\Delta R^2 = .11$, $\Delta F_{(4, 39)} = 1.26$, $p = .30$), nor the full model ($R^2 = .15$, $F_{(7, 39)} = 1.00$, $p = .45$) was statistically significant.

Discussion

The purpose of this study was to investigate the associations between child temperament and student-teacher relationship quality. Specifically, this study examined the ability of combinations of child temperament variables to predict levels of closeness, conflict, and dependency within the student-teacher relationship. In order to provide an empirical basis for selecting the specific temperament domains to use as predictors, exploratory factor analyses were conducted with the current dataset. Three distinct components emerged and were labeled Social Response and Mood (Mood, Adaptability, Approach), Stimulation and Energy (Threshold of Responses, Intensity of Responses, and Distractibility), and Task Orientation and Rhythmicity (Persistence, Rhythmicity, Activity). Using these components as predictors, both individually and interactively, the hypothesis was not supported. In general, temperament did not demonstrate significant associations with student-teacher relationship quality. Positive correlations did emerge between the interaction of Social Response/Mood and Stimulation/Energy with Closeness and Dependency.

The results of the multiple regression analyses were not significant, which is consistent with previous research described by Sroufe (1985), whose examination of the attachments between infants and parents in the context of Ainsworth's Strange Situation procedures (Ainsworth & Wittig, 1969) highlights disagreement about the contributions of temperament to attachment. Sroufe (1985) claimed that "…temperament constructs seem to have little power in explaining security of attachment" (p. 12) and distinguished between a temperament and relationship interpretation of the attachment literature. According to a temperament perspective, variations in attachment patterns are due, at least in part, to individual differences in temperament. In contrast, Sroufe (1985) reported the relationship

interpretation views temperament and attachment as "fundamentally different constructs" (p. 12) and purports that variations in attachment reflect purely relational behaviors. The implications of considering different interpretations of the attachment literature are critical to our understanding of children's individual behaviors. For example, depending on one's perspective (e.g., temperament versus relationship view of attachment), similar behaviors (e.g., crying,) may be attributed to different constructs. For instance, temperament researchers may assert that a child cries frequently because he or she is innately predisposed to have a negative mood. In contrast, attachment researchers are unlikely to examine, non-contextually, a child's propensity to display a discrete behavior like "crying"; rather, they are more likely to focus on the relationship contexts in which a child does or does not exhibit the behavior and may attribute this same child's crying to the relationship he or she has with the caregiver.

Vaughn, Lefever, Seifer, and Barglow's (1989) results support Sroufe's (1985) findings; temperament and attachment are distinct constructs. Vaughn and colleagues (1989) examined the relationships between temperament scores and indexes of emotionality observed at separation and reunion episodes during the Strange Situation procedure. Vaughn et al.'s results provide evidence to further support Sroufe's (1985) claims that temperament did not demonstrate significant effects on attachment security, thus suggesting that temperamental difficulty and attachment security are not directly related.

The previously described studies by Sroufe (1985) and Vaughn et al. (1989) provide information that should be considered in the interpretation of the current findings, particularly since the basis for Pianta's (1999) conceptualization of student-teacher relationships is, at least in part, based on the attachment literature. To assert that

temperament does not play a significant role in relationship quality requires the assumption that attachment behaviors are remarkably different from temperament and therefore can be distinctively separate from attachment behaviors. Although Sroufe (1985) did find that temperamental characteristics were correlated with attachment variables, temperament did not appear to be a significant independent predictor of attachment classifications. Sroufe (1985) concluded that attachment results from the caregiver-infant relationship, rather than a child's temperament. His conclusion supports the relationship perspective and suggests that temperament does not play a critical role in the caregiver-infant attachment. Thus, although the student-teacher relationship differs in significant ways from the infant-caregiver attachment, the lack of statistical findings in the current study appears to both support and be supported by the tradition and empirical evidence of the attachment literature represented by attachment researchers, which supports a relationship perspective rather than a temperament interpretation of the attachment (Sroufe, 1985; Vaughn et al., 1989).

There is existing empirical support for the two significant findings that emerged from the current study, as other researchers have found associations between similar temperament dimensions and student-teacher relationship quality. The current analyses revealed interactions between the Social Response/Mood (Mood, Adaptability, Approach/Withdrawal) and Stimulation/Energy (Threshold of Responsiveness, Intensity, Distractibility) components as predictive of closeness and dependency in the student-teacher relationship. Temperament characteristics that indicate a child's quality of mood, ability to adapt to changes in his or her environment, and readiness to join in new activities interact with characteristics that indicate the level of intensity needed from outside stimuli to evoke a response from the child and the energy level of responses to internal and/or external stimuli. Guerin et al. (1994) findings

indicated that mood, distractibility, intensity of reactions, and adaptability significantly

correlated with student-teacher relationship quality in a sample of adolescents. It is important

to note that in the context of the current multiple regression analyses, in which only unique

variance was considered, these relationships appear to have been obscured and therefore, it is

necessary to attend to the zero-order correlations in order to observe the associations.

The extant literature described provides contradictory evidence about the relationship

between child temperament and student-teacher relationship quality. There is support for

both the lack of associations in the current study and for the significant findings that

emerged. The differing identification of temperament factors, or clusters, within the

temperament research suggests further investigation of what these factors mean and what

implications they may have in the classroom and for student-teacher relationship seems

warranted. Previous studies also support the need for such investigation. For example, Keogh

and Burstein (1988) identified three factors – Task Orientation (Activity, Persistence, and

Distractibility), Personal-Social Flexibility (Adaptability, Approach/Withdrawal, Positive

Mood), and Reactivity (Threshold of Response, Intensity, Negative Mood) – that are closely

related to those identified in the current study. Their factors were found to predict

interactions between students and teachers and between students and peers among children

with disabilities.

When attempting to understand how the current study findings relate to the extant

(contradictory) literature, it is important to consider differences in the participants. The

existing studies' samples ranged from infancy (Berry & O'Conner, 2010; Vaughn et al.,

1989) to adolescence (Guerin et al., 1994) and included children from various ethnicities and

socio-economic statuses. Furthermore, some previous studies have examined temperament

and student-teacher relationship quality among children with and without disabilities, and the current study did not assess disability status. Differences in sample characteristics certainly may have contributed to the lack of significant findings in the current study, which are in contrast to some of the extant findings. The varying temperament factors or components examined within the literature may also be related to the differences between the characteristics of the current sample (higher levels of rhythmicity and approachability and lower levels of intense reactions and threshold to stimulus) and those within the literature.

Additionally, the use of a preschool sample may provide an explanation for the findings with regard to student-teacher relationship quality. The relationships between preschool children and their teachers are different than student-teacher relationships in later educational settings, as are the expectations for students at these different grade levels. It is possible that these differences may have contributed to the current lack of statistically significant findings. For example, preschool settings are not as formal as kindergarten and early elementary classrooms and thus, preschool teachers' roles and responsibilities and interactions with the children are different. Teachers of school-age children are responsible for actual academic instruction, whereas in many, if not most preschools, the teachers' roles are more about nurturing the children and guiding them through the day. Additionally, because school work in later grades requires a greater degree of independence, it is possible that temperament traits begin to exert a more influential role as children enter early elementary grades. Thus, it may be that temperament is a better predictor of student-teacher relationships in school-age children than for preschoolers.

It is important to note that the attachment between an infant and caregiver simply parallels the student-teacher relationship. The attachment classification an infant and

caregiver share is not expected to be predicted by discrete temperamental traits of the infant but rather the "goodness of fit" between the infant and the caregiver. The conceptualization of attachment differs from other important relationships, including the student-teacher relationship, as attachment is proposed as an evolutionary, adaptive means of humans in which the bond between infant and caregiver enhances the infant's chances of survival (Bretherton, 1992). Attachment research simply provides a basis from which to understand early adult-child relationships. Furthermore, infants rely heavily on their caregivers due to their need to survive. Preschool aged children likely experience a more reciprocal relationship with their teachers, indicating another significant difference among the relationship between an infant and a caregiver and that of a student and teacher.

Limitations

The current sample was relatively homogeneous in terms of race and parent education levels, though children from both rural and urban settings were represented. This lack of diversity limits the generalizability of the findings to a more heterogeneous sample of preschool children. The current sample of preschool aged children had higher levels of rhythmicity and approachability and lower levels of intense reactions and threshold of responsiveness than the BSQ normative sample; furthermore, there was a lack of variance among the ratings. Also, the small sample size may have prevented significant results from emerging. A larger sample size would have provided more power, resulting in a greater likelihood of statistical significance. For instance, the change in R^2 for Step 2 of the multiple regression analyses for Closeness (.19) and for Dependency (.11) were large effects and would be noteworthy findings if they were statistically significant.

Also, there is some concern about the use of different raters to obtain the data for the study, as comparisons were made between parent-rated child temperament and teacher-rated student-teacher relationship quality. Existing studies have found low convergence between parents' and preschool teachers' ratings of child temperament (Northam, Prior, Sansom, & Oberklaid, 1987) and behavior problems (Hinshaw, Han, Erhardt, & Huber, 1992), suggesting that a lack of rater agreement may have influenced the current findings. It is possible that if a multi-method, multi-informant approach had been implemented, in which teacher-ratings of child temperament and third-party observations of temperament and relationship quality had been included, the findings about the relationships among the constructs may have been more meaningful.

Additionally, the selection of the temperament dimensions and use of the BSQ may have limited the findings. Previous studies have relied on different conceptualizations of temperament. For example, Rothbart and Bates (1997) referred to self-regulation and reaction to the environment, Buss and Plomin (1975) focused on emotionality, activity, and sociability, and Goldsmith (1987) referred to the expression of primary emotions and personal reflection of an individuals' experiences. It is possible that different temperament variables may have produced significant findings.

Future Research

Future research should include a larger, more diverse sample in order to find more robust results that may be generalized to the larger preschool population. Research using twins in different classrooms may be useful in controlling for temperament's possible impact on student-teacher relationship quality.

Preschool assessment should be ecological and include data from multiple informants using multiple methods (Neisworth & Bagnato, 2005). Future research should follow these guidelines and utilize both teacher ratings of child temperament and third-party observations of both child temperament and student-teacher relationship quality. It also would be useful to consider other predictor variables in addition to temperament, such as teaching stress or parenting variables.

Future research also should investigate interactions among independent temperament variables (Mood, Adaptability, Approach/Withdrawal, Threshold, Intensity, Distractibility, Activity, Rhythmicity, Persistence) in order to gain a more meaningful understanding about the specific influence child-temperament has on the quality of student-teacher relationships. As previously mentioned, it may be beneficial to rely on different conceptualizations of temperament provided by researchers other than Thomas, Chess, and Birch (1968).

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Appendix A

APPALACHIAN STATE UNIVERSITY
Informed Consent for Participants in Research Projects Involving Human Subjects

Title of Project: <u>Ecological Correlates of Child Temperament</u>   Investigators: <u>Sandra Glover Gagnon, Marissa Swaim</u>

I. Purpose of this Research/Project

The purpose of this research is to study how preschool children's temperaments, or their individual ways of responding emotionally to their environments, relate to different social and behavioral characteristics. Previous research indicates that child temperament affects the ways in which they get along with their parents, teachers, and friends, and that these individuals play important roles in the development of young children's thinking abilities, social skills, and readiness for school. We are interested in learning more about the relationships between these aspects of early child development and in developing strategies for promoting positive experiences for children in preschool and future school settings.

In order to carry out this study, we need to collect information from parents about their own children and from teachers regarding their students. Any child between the ages of 3 and 5 years is eligible to participate in the study. We need to collect information for at least 100 students so that our results will be meaningful.

II. Procedures

If you, as a parent or teacher, would like to participate, please sign this form, keep one copy for your records, and return a signed copy to us in the self addressed, stamped envelope provided. Once we receive your signed consent form, teachers will receive packets of questionnaires to complete for participating children in their classes. For parents, we will ask your child's teacher to send a packet of questionnaires home. Upon completion of the questionnaires, we ask that you return the packet to your child's teacher, who will then return, along with their own completed packets, to us in a self-addressed, stamped envelope that we will provide. Following is a list of the questionnaires we will be asking you to fill out:

TEACHER QUESTIONNAIRES	TIME REQUIRED	PARENT QUESTIONNAIRES	TIME REQUIRED
Behavior Assessment Scale for Children	10-20 mins	Behavior Assessment Scale for Children	10-20 mins
Penn Interactive Peer Play Scale	10 mins	Penn Interactive Peer Play Scale	10 mins
Student-Teacher Relationship Scale	10-15 mins	Behavioral Style Questionnaire	20-30 mins
Index of Teaching Stress	20-25 mins	Parent-Child Relationship Inventory	15-20 mins
Adult Temperament Questionnaire	15-20 mins	Parenting Stress Index	20-30 mins
ESTIMATED TIME FOR TEACHER MEASURES	**65-90 minutes per child**	**ESTIMATED TIME FOR PARENT MEASURES**	**75-90 minutes per child**

III. Risks

To the best of our knowledge, you should experience no more risk of harm than you would in everyday life.

IV. Benefits

You will not receive any more benefit from participating in this study than you would experience from your regular involvement with the daycare or preschool. However, participation in the study will help us understand more about relationships between young children and their parents, teachers, and friends, which may in turn inform us about how to promote healthy school adjustment. You may also find it interesting to think about your child or the children with whom and how you relate to one another.

V. Extent of Anonymity and Confidentiality

Participation in this study is confidential; *no one but the members of the research team will have access to the information you provide*. In order to maintain the confidentiality of responses, names of children will be used on the questionnaires only for initial identification purposes. Once the forms are completed, children's names will be converted to identification numbers and the information will be entered into a computer database according to the numbers. The computer files will be password protected and will be available only to members of the research team. The actual questionnaires and Informed Consent forms will be kept in a locked file cabinet in the office of the primary researcher.

It is important to note that neither parents nor teachers will have access to the information provided by one another about the children. The purpose of this level of confidentiality is to ensure participants' comfort in their ability to responding honestly and without concerns that their responses will be viewed by anyone else involved with the child. In addition, any information published or presented from this research will contain no reference to any names or other identifiable information of children, parents or teachers. Questionnaires and informed consent forms will be shredded 5 years after the conclusion of the study. Computer files will be maintained by the primary researchers for 8 years and will be destroyed after that time has elapsed.

Information gained from the study will be used and reported only for the purposes described in this Informed Consent form. At no time will the researchers release the results of the study to anyone other than the individuals working on the project (*listed above*) without your written consent.

VI. Compensation

We realize that your time is very valuable and plan to provide a small monetary reimbursement for your time and energy. The first 80 parents and teachers to return their packets will each receive $10 (teachers will receive $10 per packet completed). Pending continued availability of funds, parents and teachers beyond the first 80 will also be reimbursed.

VII. Freedom to Withdraw

Permission to participate in this study is completely voluntary. If you should decide that you do not want to have your child's information included in the study or decide to withdraw your consent at any time during the course of the study, no penalty will be involved.

VIII. Approval of Research

This research project has been approved, as required, by the Institutional Review Board of Appalachian State (IRB Protocol #05-40; Approval Date: 12/0104 / Expiration Date 05/05/10) and the daycare center or preschool listed below.

IX. Parent / Teacher Responsibilities

I voluntarily agree to participate in this study. I have the following responsibilities: *I agree to complete the requested questionnaires and return them to the research team as soon as possible.*

X. Parent / Teacher Permission

I have read and understand the Informed Consent form and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent. I understand that the information I provide will not be shared with anyone outside of the research team. In addition, I understand that I will not have access to the information provided by someone else about my own child (*parents*) or about students in my class (*teachers*).

_____   _____   _____
Parent / Teacher signature *(circle one)*   Printed Name   Date

_____
Child's Name   Age   Date of Birth   Parent's Name(s)

_____ _____
Name of preschool/daycare center   Child's Teacher

_____
Home or Work Address   City   State   Zip   Phone   email
Best times to contact you _____
Special Comments_____

Should I have any questions about this research or its conduct, I may contact:

Sandra Glover Gagnon   828-262-8683 / gagnonsg@appstate.edu
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Assistant Professor
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Robert L. Johnson   828-262-2692 / johnsonrl@appstate.edu
Administrator, IRB   Telephone/e -mail
Graduate Studies and Research
Appalachian State University
Boone, NC 28608

Appendix B

To: Sandra Gagnon
Psychology
CAMPUS MAIL

From: _____

      Jay Cranston, MD, Chair, Institutional Review Board

RE: Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)

Date: 5/06/2009

Study #: 09-0247
Study Title: Ecological Correlates of Child Temperament (old 05-40)

Submission Type: Renewal
Expedited Category: (7) Research on Group Characteristics or Behavior, or Surveys, Interviews, etc.

Renewal Date: 5/06/2009
Expiration Date of Approval: 5/05/2010

This submission approval has been renewed by the above Institutional Review Board for the period indicated.
Study Specific Details:

Additional investigators have been included at various times in the renewal process, but have not been sent a copy of the renewal.

Investigator's Responsibilities:

Federal regulations require that all research be reviewed at least annually. It is the Principal Investigator's responsibility to submit for renewal and obtain approval before the expiration date. You may not continue any research activity beyond the expiration date without IRB approval. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.

You are required to obtain IRB approval for any changes to any aspect of this study before they can be implemented. Should any adverse event or unanticipated problem involving risks to subjects occur it must be reported immediately to the IRB.

Table 1

Temperament dimensions and definitions

Dimension	Definition
Activity level	This includes amount of physical activity during everyday life activities (i.e. bathing, eating, playing, and dressing), and during inactive periods.
Rhythmicity (regularity)	The predictability and/or unpredictability of hunger, elimination, and sleep-wake cycles.
Approach or withdrawal	The nature of the initial response to new stimuli (i.e. New food, toy, or person). Approach responses are positive (smiling, laughing, swallowing new food, reaching for a new toy, etc.). Withdrawal reactions are negative (crying, grimacing, moving away, spitting new food out, etc.).
Adaptability	The way a child responds or adapts to a new environment or to a change in his/her current environment. The ease in which a child is able to be redirected when there is a change in his/her environment.
Threshold of responsiveness	The intensity of sensory stimulation, social contact, or environmental stimulation needed to evoke a response from the child.
Intensity of reaction	The energy level of response, regardless of Its quality or direction.
Quality of mood	The level of pleasantness and friendly behavior versus unpleasant, crying, and unfriendly behavior.
Distractibility	The ease with which a child's behavior is affected by outside stimuli.
Attention span and persistence	Attention span is considered the length of time a child practices a particular activity. Persistence refers to the continuation of an activity even when faced with barriers.

Table 2

Components, Loadings, Communalities, and Percents of Variance for Second-Order Principal Components

Analysis and Oblimin Rotation of BSQ Scales

Scale	Social Response/ Mood	Stimulation/ Energy	Task Orientation/ Rhythmicity	h^2
Mood	.84			.56
Adaptability	.80			.52
Approach	.68			.49
Threshold		.83		.80
Intensity		.71		.71
Distractibility		.66		.76
Persistence			.80	.69
Rhythmicity			.71	.73
Activity			.58	.70
% of variance	31.77	20.43	14.00	

Note. Loadings over .55 (30% overlapping variance) are displayed

Table 3

Descriptive Statistics and Correlations among Study Variables

	1	2	3	4	5	6	7	8	9	10
1. Social Response/ Mood										
2. Stimulation/ Energy	.10									
3. Task Orientation/ Rhythmicity	.45**	-.08								
4. Social Response/ Mood x Stimulation/ Energy	.31*	.05	-.04							
5. Social Response/ Mood x Task Orientation/ Rhythmicity	.14	-.06	.09	-.40**						
6. Stimulation/ Energy x Task Orientation/ Rhythmicity	-.05	.00	.25	-.01	-.39*					
7. Social Response/ Mood x Stimulation/ Energy x Task Orientation/ Rhythmicity	-.48**	-.01	-.40**	-.43**	.28†	-.26†				
8. STRS Closeness	.13	.00	.02	.44**	-.03	-.05	-.14			
9. STRS Conflict	.10	-.20	.29	.01	.13	.05	-.04	-.13		
10. STRS Dependency	.22	.11	.07	.35*	-.07	.05	-.19	.26†	.52***	
Mean	0.09	0.11	-0.03	0.24	0.96	-0.13	-0.12	45.76	19.67	9.81
SD	1.71	1.39	1.27	2.43	2.81	1.23	3.00	6.31	9.23	4.09

Note. Main diagonal contains Cronbach's coefficient alpha. The data above represent individuals for whom all data are present, thus $N = 43$.

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

Table 4

Hierarchical Multiple Regression Analyses: Closeness, Conflict, and Dependency from Temperament and Temperament Interactions

	Criterion					
	Closeness		Conflict		Dependency	
Predictor	ΔR^2	B	ΔR^2	B	ΔR^2	B
Step 1	.02		.09		.04	
Social Response/ Mood		.55		.05		.51
Stimulation/ Energy		.11		-1.03		.14
Task Orientation/ Rhythmicity		-.39		.17		-.16
Constant		45.60		19.60		9.83
Step 2	.19		.04		.11	
Social Response/ Mood		-.31		-.14		.13
Stimulation/ Energy		.24		-1.00		.21
Task Orientation/ Rhythmicity		.29		1.90		.03
Social Response/ Mood x Stimulation/ Energy		1.44*		.62		.63
Social Response/ Mood x Task Orientation/ Rhythmicity		.43		.63		.18
Stimulation/ Energy x Task Orientation/ Rhythmicity		.20		.89		.36
Social Response/ Mood x Stimulation/ Energy x Task Orientation/ Rhythmicity		.12		.31		-.01
Constant		44.98		19.08		9.55
Total R^2	.21		.13		.15	
N	47		47		47	

† *p* < .10.

VITA

Heather Ann Holt was born in Burlington, NC, on July 27th, 1985. She attended school within the Alamance-Burlington School System and graduated from Western Alamance High School in 2003. The following autumn she entered Appalachian State University and in May 2007 she was awarded her Bachelor's of Science degree in Psychology. In the spring of 2007, Ms. Holt accepted a position in the graduate program of School Psychology at Appalachian State University and began study toward Masters of Arts and Specialists degrees in School Psychology. During the 2009-2010 school year, she served as a school psychology intern in the Alamance-Burlington School System. Heather will be awarded her degrees in August 2010 upon completion of program requirements.

Ms. Holt's home address is 2661 Pitt Rd., Elon, North Carolina. Her parents are Mr. Michael D. Holt and Cathy H. Holt.