Family stability as a moderator of the relationship between child temperament and child adjustment

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FAMILY STABILITY AS A MODERATOR OF THE RELATIONSHIP BETWEEN
CHILD TEMPERAMENT AND CHILD ADJUSTMENT

by

Meena Choi, MA

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Abstract

Empirical literature has demonstrated a relationship between the constructs of family stability and child adjustment, as well as between child temperament and adjustment. The mechanisms through which these constructs relate to one another, however, have not been directly explored. The current study evaluates one proposed model in which family stability is hypothesized to moderate the relationship between child temperament and child adjustment, such that the relationship between child temperament and child adjustment would vary depending upon the level of molecular family stability present. Participants were 125 parents and 69 teachers of five-year-old children in kindergarten. Parents were asked to complete measures of family stability, child temperament, and child adjustment, and teachers were asked only for reports of child adjustment. Multiple regression analyses were used to evaluate the hypothesized moderation model. While the results did not support the hypothesized moderation model, several findings were worth noting. Although greater levels of the child temperament qualities of both self regulation and inhibition were related to lower levels of both parent- and teacher-reported child externalizing behavior problems as hypothesized, the predicted relationships between both child temperament qualities with child internalizing behavior problems were not found. In addition, the predicted relationship between family stability and child adjustment was not found. Possible explanations for the non-significant findings are discussed, including conceptual issues related to the age of the child participants and several methodological concerns regarding the reporting of child adjustment, sample size, and data analytic strategy. Results are also discussed in terms of avenues for further research and potential clinical applications of the findings regarding
molecular family stability.
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Chapter I

Introduction
Empirical literature has demonstrated a relationship between the constructs of family stability and child adjustment, as well as between child temperament and subsequent adjustment. A developing body of literature has begun to examine the relationships among family environment variables (e.g., parenting style, parenting behavior, parental variables), child temperament, and child adjustment in attempts to better understand how these variables interact to influence child development. The current study will evaluate one such proposed model in which family stability is hypothesized to moderate the relationship between child temperament and child adjustment.

The present review will begin with a discussion of the conceptualization and measurement of family stability, as well as research findings supporting the relationship between family stability and child adjustment.

Following the introduction of family stability and its reported relationship with child adjustment, the review will discuss child temperament and the various conceptualizations of child temperament in the empirical literature. The discussion will then continue with an exploration of the research providing evidence of the association between child temperament and child adjustment.

The third section of the present review will introduce the empirical literature regarding the relationships among family influences, child temperament, and child adjustment. Lastly, the discussion will conclude with a presentation of the present study.

*Family Stability and Child Adjustment*

The importance of family stability in the lives and adjustment of children is frequently reported in the clinical literature. Family stability has been reported as a
significant factor in shaping the outcomes of children who have experienced a variety of potentially adverse circumstances such as parental alcoholism (Hawkins, 1997), divorce (Guidubaldi, Cleminshaw, Perry, Nastasi, & Lightel, 1986; Sandler, Wolchik, Braver, & Fogas, 1991), parental death (West, Sandler, Pillow, Baca, & Gersten, 1991), maternal stress (Brody & Flor, 1997), pediatric illness (Fife, Norton, & Groom, 1988; Markson & Fiese, 2000), and low socioeconomic status (Ackerman, Kogos, Youngstrom, Schoff, & Izard, 1999; Keltner, 1990; Masten, Morison, Pellegrini, & Tellegen, 1990; Stoneman, Brody, Churchill, & Winn, 1999). Family stability is also reported to contribute to developmental outcomes in children who have not experienced such challenging situations (Boyce, Jensen, James, & Peacock, 1983; Roberts, 1988; Wolin & Bennett, 1984). Family stability is believed to provide children, regardless of circumstance, with a sense of predictability, control, and permanence.

Much of the stability literature however, has lacked consensus regarding a clearly defined, comprehensive conceptualization of the construct of family stability. Instead, many empirical studies that have garnered support for the stability construct have utilized one of a variety of loosely-articulated conceptualizations of stability that generally emphasize distal events or influences such as change in the structural aspects of the family (Masten et al., 1990). Parental divorce, family changes in residence or composition, and school changes for children (Ackerman et al., 1999; Fergusson & Lynskey, 1995; Masten et al., 1990; Stoneman et al., 1999; Vaughn, Egeland, Sroufe, & Waters, 1979) are often cited examples of such structural aspects of the family conceptualized as stability in the literature.

More recently, however, a growing body of literature has also provided support
for the importance of the stability of those family processes with more proximal influences on children and their adjustment. In such studies, authors have suggested the frequency and predictability of family rituals as an indicator of stability (Fiese & Kline, 1993), while others have suggested stability may be evidenced by the frequency of family activities and routines (e.g., Brody & Flor, 1997; Guidubaldi et al., 1986; Jensen, James, Boyce, & Hartnett, 1983; Kliewer & Kung, 1998). Similar to the distal conceptualizations of family stability, there are a variety of ways in which researchers have defined family stability as the more proximal, day-to-day, influences a child experiences in the family environment.

One conceptualization related to the more proximal notion of family stability is the concept of family rituals. Family rituals have been defined by Fiese and Kline (1993) as patterned family interactions that are ascribed symbolic meaning by family members. Family rituals include “patterned interactions,” such as the assignment of roles at dinnertime, “family traditions,” such as the frequency with which the family vacations together, and “family celebrations,” as in the case of religious holidays (Markson & Fiese, 2000; Wolin & Bennett, 1984). In their research, Wolin, Bennett, and Noonan (1979, 1984) reported improved outcomes for children and young adult children of parents with alcoholism when raised in families that deliberately executed consistent family rituals. More specifically, when at least one alcoholic parent maintained rituals in the family, the children in these families demonstrated fewer emotional and behavioral problems as children, and lower rates of alcohol problems as adults. More recent research by Fiese and colleagues (1992, 1993), utilizing the Family Rituals Questionnaire (FRQ; Fiese & Kline, 1993) in college student samples, also supports the value of family
rituals in healthy adjustment. Self-ratings of both the frequency and predictability of the occurrence of family rituals were found to significantly positively predict students’ level of general self-esteem and decreased level of anxiety. Lastly, in a sample of 6- to 12-year-old children, Markson and Fiese (2000) reported that anxiety in children was found to be inversely related to parental reporting of the degree to which family rituals are an integral part of family practices, once again suggesting adherence to family rituals as beneficial to children’s adjustment.

As suggested above, the concept of family rituals incorporates a symbolic notion of behavior. Another conceptualization related to the more proximal aspect of family stability is the concept of family routines. Jensen, James, Boyce, and Hartnett (1983) defined family routines as observable behaviors between two or more family members that occur predictably and frequently in the daily lives of families. Family routines include activities such as eating together as a family, regular chore assignments and performance, and parents reading or telling stories to their child (Jensen et al., 1983). Research regarding family routines, as assessed by the Family Routines Inventory (FRI; Jensen et al., 1983), suggests that frequent practice of such family routines is associated with better adjustment for both children and adults from a variety of adverse circumstances (Brody & Flor, 1997; Hawkins, 1997; Keltner, 1990; Kliwer & Kung, 1998).

Brody and Flor (1997) examined the influence of family routines on the adjustment of African-American schoolchildren from economically stressed and impoverished rural families. The results of the structural equation modeling analyses indicated that family routines mediated the negative influence of economic stress on both
children’s internalizing and externalizing behavior, as well as children’s academic achievement. In addition, specifically for boys, the results indicated a direct relationship between increased frequency of family routines and improved academic achievement as well as decreased internalizing behaviors.

Kliwer and Kung (1998) reported similar findings in their investigation of possible moderating family factors (e.g., frequency of family routines) of the relationship between family stress and adjustment in economically deprived schoolchildren. In this study, increased frequency of family routines was found to be a protective factor that moderated the negative impact of family stress on children’s internalizing and externalizing behavior problems. In families that maintained a high level of family routines, the relationship between family stress and children’s behavior problems was nearly completely diminished, that is, despite the intensity of familial stress present low levels of children’s behavioral problems were reported.

Another line of research by Sandler and colleagues, which has highlighted the importance of stable positive events for child adjustment, also relates to the proximal aspects of family stability. Stable positive events were defined as family events which the child rated as positive (e.g., “Doing fun things with Dad”) and for which the rate of occurrence remained the same from before to after parental divorce or death. Sandler, Wolchik, Braver, and Fogas (1991) reported that among school-aged children from divorced families, better overall adjustment was associated with the stable occurrence of positive events, rather than with an increase of positive events. The authors proposed that stability of positive events in a child’s world, particularly in cases where extreme change is occurring (i.e., divorce or loss of a parent), offers children the message that the world is
a safe and somewhat predictable place. Not surprisingly, the association of stable positive events and improved child adjustment, as evidenced by lower levels of problem behavior and symptoms of depression, was also reported among children who had experienced the death of a parent (West, Sandler, Pillow, Baca, & Gersten, 1991). The data from this line of research has suggested that the negative impact of major familial changes, such as the divorce or death of a parent, on children may not be direct but instead may be influenced by change in the quality of the more proximal aspects of family environment (e.g., the occurrence of stable positive events) after the major familial change has occurred. The results from this conceptualization of family stability have therefore not only contributed to the research demonstrating the relationship between family stability and child adjustment, but have also highlighted the importance of examining possible mediating and moderating factors of the relationship between the two variables.

The conceptualization of family stability most relevant to the current study is that of Israel and colleagues. Israel and colleagues have termed those family processes that a child experiences on a regular basis with more proximal influence upon a child, “molecular family stability” (Israel & Roderick, 2001; Israel, Roderick, & Ivanova, 2002). Molecular family stability encompasses a wide range of family activities that may occur in any given household, such as daily routines (e.g., mealtimes, bedtimes, homework, chores, etc.), meaningful activities with the family (e.g., parents setting time aside to talk with the child, enjoyable weekend family activities), as well as social activities arranged and supported by the immediate family but that may occur outside of the home (e.g., contact with friends, participation in organized activities such as scouts or
team sports). The emphasis of this conceptualization of family stability is on regularity, rather than on frequency, of positive family activities, as regularity appears to be a salient factor in predicting positive child adjustment (Sandler et al., 1991; West et al., 1991).

The initial studies in this line of research examined the relationship between retrospective reports of family stability during childhood and current psychosocial adjustment in samples of young adults. More specifically, the results of these studies indicated that college students’ reports of family stability within their family of origin were found to be positively related to their current levels of reported self-esteem and negatively related to their current levels of depressed affect (Israel & Roderick, 1998, 1999, 2001; Israel, Roderick, & Ivanova, 2002). In a more recent study of undergraduate students, Sokolowski and Israel (2008) investigated the relationship between family stability, perceived anxiety control, depression and anxiety. Similarly to previous studies, the results suggested an inverse relationship between family stability and both measures of adjustment (i.e., depression and anxiety) such that, higher levels of family stability were associated with lower reported levels of depression and anxiety. The results also supported a more specific model in which perceived anxiety control was found to mediate the relationship between family stability and both depression and anxiety.

Additional studies conducted by Israel and colleagues examined family stability as reported by children and their parents and the impact molecular family stability had on the children’s concurrent adjustment. For instance, Roderick (2002) investigated the role of family stability as a mediator of the relationship between maternal attributes and child adjustment in a community sample of school-aged children and their families. As
hypothesized, family stability was found to mediate the relationship between maternal attributes (e.g., parental sense of competence) and internalizing and externalizing behavior problems in children. In addition, higher levels of family stability, as reported by both mother and child, were associated with greater child adjustment (i.e., lower levels of child internalizing, externalizing, and total problems) as reported by mothers. In addition, a study conducted by Ivanova and Israel (2006) investigated the influence of family stability as a protective factor against maladjustment for youth exposed to conditions of adversity. Once again, both mother- and child-reports of family stability were associated with more positive child adjustment and child-reported family stability was found to significantly attenuate the influence of parental distress on parent-reported child internalizing behavior problems.

More recently, Chalmers (2005), Them (2007), and Sokolowski (2008) also examined the relationship between molecular family stability and child adjustment in samples of elementary school children and their mothers. Findings from these studies were congruent with the aforementioned studies, as well as with one another, such that higher levels of family stability were related to more positive child adjustment. More specifically, both Chalmers (2005) and Sokolowski (2008) found greater levels of family stability to be associated with fewer internalizing, externalizing, and total behavior problems, while Them (2007) found a significant relationship between family stability and children’s internalizing problems.

Taken together, the family stability and related literatures suggest the importance of family stability in influencing children’s adjustment. These findings suggest that greater predictability, consistency, and regularity in the family environment is likely to be
associated with more adaptive child adjustment.

**Temperament and Child Adjustment**

The relationship between temperament and subsequent adjustment has been thoroughly examined and well established in the research literature (Rothbart & Bates, 2006). More specifically, there is strong empirical support to suggest that temperament may act as a predictor of child adjustment, and particular temperament characteristics have been reported to act as risk factors for the development of a variety of adjustment issues (Rothbart & Bates, 2006). While the extant literature has proposed and explored a number of ways through which temperament may influence adjustment (e.g., direct linear effects, mediating processes, and moderating influences), evidence has been strongest for direct linear effects, whereby temperament is viewed as a vulnerability factor that increases the likelihood of adjustment problems under various conditions (e.g., stress, poor goodness-of-fit between parenting style and child temperament, etc.) (Nigg, 2006; Rothbart & Bates, 2006).

Similarly to family stability, there are a number of different approaches to conceptualizing temperament in the research literature (e.g., Buss & Plomin, 1984; Goldsmith & Campos, 1990; Kagan, 1994; Rothbart, 1989; Thomas & Chess, 1977). The well-known and highly referred to work of Thomas and Chess in the New York Longitudinal Study (NYLS; Thomas & Chess, 1977) identified nine continuous dimensions of temperament (i.e., Activity Level, Mood, Approach/Withdrawal, Intensity, Threshold, Rhythmicity, Distractibility, Attention Span/Persistence, and Adaptability) as well as three higher-order categories of “difficult,” “easy,” and “slow to warm up.” Buss and Plomin (1975; 1984) highlighted the idea of temperament traits being endogenous
and appearing early in life when generating their three temperament dimensions of Emotionality, Activity, and Sociability (EAS). When Rowe & Plomin (1977) combined and administered a select set of items from both the NYLS and EAS scales, the temperament dimensions of Emotionality, Soothability, Activity Level, Attention Span, and Sociability were identified from an item-level factor analysis. Taking the previous temperament investigations into consideration, as well as their own research (Capaldi & Rothbart, 1992; Derryberry & Rothbart, 1988), Rothbart and colleagues (Rothbart et al., 2001) identified 15 primary temperament characteristics (i.e., Positive Anticipation, Smiling/Laughter, High Intensity Pleasure, Activity Level, Impulsivity, Shyness, Discomfort, Fear, Anger/Frustration, Sadness, Soothability, Inhibitory Control, Attentional Focusing, Low Intensity Pleasure, and Perceptual Sensitivity) and three broad dimensions of temperament: Negative Affectivity, Extraversion/Surgency, and Effortful Control.

In addition to these highly cited temperament taxonomies, there are several others in the temperament literature whereby the organization, number, and names of temperament dimensions varies by taxonomy. Despite the variations in categorization or nomenclature, there is a general consensus as to what defines temperament. Temperament is the physiological basis for individual differences in reactivity and self-regulation, in the domains of affect, activity, and attention, thought to appear early in life and remain relatively consistent over time (Campos, Campos, & Barrett, 1989; Goldsmith, Buss, Plomin, Rothbart, Thomas, Chess, Hinde, & McCall, 1987; Rothbart, Derryberry, & Hershey, 2000; Rothbart & Bates, 2006).

As research in the temperament realm has progressed, fewer studies are
examining the relationships of categories of temperament (e.g., “difficult”, “easy”, etc.) with child adjustment and a greater number of researchers are investigating the associations of specific temperament dimensions with child adjustment. While the labels used vary across studies, the existence of three broad temperament dimensions—reactivity, approach or inhibition, and self-regulation—is now widely accepted among temperament researchers as the domains that define temperament (Rothbart & Bates, 2006).

Prior to a discussion of the two temperament dimensions of interest to the present study, the temperament dimension of reactivity will be briefly introduced. Reactivity refers to emotional volatility, irritability, and demonstrable negative affect. Some researchers have referred to this temperament dimension as negative emotionality, irritability, anger, or general distress proneness (Sanson, Letcher, Smart, Prior, Toumbourou, & Oberklaid, 2009). Reactivity has been associated with both internalizing and externalizing adjustment problems (Brendgen, Wanner, Morin, & Vitaro, 2005; McClowry, Giangrade, Tommasini, Clinton, Foreman, Lynch, & Ferketich, 1994; Nelson, Martin, Hodge, Havill, & Kamphaus, 1999) and poor social skills (Murphy, Shepard, Eisenberg, & Fabes, 2004). While negative reactivity is a fundamental dimension of temperament, it was not selected for further examination in the current investigation.

**Temperament Dimensions and Adjustment Outcomes**

The two temperament dimensions of interest to the present study are inhibition and self regulation. Literature reviews of temperament studies have suggested a clear link between inhibition and internalizing behavior problems, as well as between self
regulation and externalizing behavior problems. The relationships between inhibition and externalizing behavior problems, and self regulation and internalizing behavior problems, however, remain less clear (De Pauw, Mervielde, & Van Leeuwen, 2009; Rothbart & Bates, 2006; Sanson et al., 2009).

**Inhibition.** Inhibition refers to a child’s responses to novel environmental circumstances, which include reactions towards both people and situations with which they are unfamiliar. This temperament dimension has also been referred to as approach-withdrawal, social withdrawal, sociability, shyness, and shy-inhibition (Sanson et al., 2009).

In their examination of the relationship between child inhibition and internalizing behavior problems, Coplan and colleagues (Coplan & Arbeau, 2008; Coplan, Arbeau, & Armer, 2008) utilized the label of shyness, and defined it as wariness and anxiety in the face of novelty and perceived social-evaluation that is characterized by an approach-avoidance conflict in such situations. They reported that in young children, shyness often manifests itself as nervousness and fear when encountering novel situations and may be expressed as embarrassment and self-consciousness as children get older. In their examination of kindergarten students, Coplan and colleagues (Coplan et al., 2008) reported that shyness was associated with a wide range of socio-emotional and school adjustment difficulties. More specifically, shyness was found to be associated with internalizing problems, as well as, difficulties with peers and teachers, lower perceived and demonstrated academic competence, and lower scores on child ratings of school enjoyment. These findings were consistent with their previous research which examined similar constructs in a population of preschool-aged children (Coplan et al., 2004).
In one of the few studies that examined the relationships between inhibition and both internalizing and externalizing behavior problems, Sanson and colleagues (Sanson, Pedlow, Cann, Prior, & Oberklaid, 1996) conducted a longitudinal study examining the stability and correlates of shyness from infancy to 6 years of age. Their results indicated that shyness was moderately stable from toddlerhood to age 6 and showed cross-situational consistency (i.e., shyness levels were similar at home and in school). The longitudinal data also indicated that in infancy shy children tended to be more irritable, less cooperative and manageable than more approaching infants, and were rated by both nurses and mothers as generally more “difficult” and “negative.” However, at ages 5 and 6, rather than being associated with “negative” characteristics in general, shyness was actually associated with a lack of externalizing problems (i.e., aggression and hyperactivity) and the presence of the internalizing problems of fearfulness, worrying, and distress as reported by teachers. The data from this study provided preliminary evidence that early temperamental shyness is specifically related to lower levels of aggression and hyperactivity as well as increased levels of anxious-fearful behavior in both home and school settings, in later years, at least up to the age of six.

Continuing the longitudinal examination of the shy-inhibited temperament, Prior, Smart, Sanson, and Oberklaid (2000) assessed the relationships between shy-inhibited temperament in childhood and anxiety concerns in early adolescence. Results from this investigation suggested that persistence of shyness, as well as the presence of shyness in middle childhood, increased risk for anxiety, however, the prediction from early temperament to internalizing disorder was modest. Prior and colleagues propose that it is
more likely that extremes of shy-inhibited behavior may be markers for later vulnerability to anxiety disorder in combination with additional intrinsic and extrinsic influences.

Kagan and his colleagues have examined the inhibition dimension of temperament and its relationship with internalizing behavior problems utilizing the more specific nomenclature of “behavioral inhibition”. According to these researchers, behavioral inhibition is defined as a temperamentally based disposition of children to react consistently to unfamiliar events, both social and nonsocial, with initial restraint (Kagan, Reznick, Clarke, Snidman, & Garcia-Coll, 1984). When confronted with a new environment, individual, or situation, behaviorally inhibited children will react with a designated pattern of response of withdrawal or behaving fearfully. Kagan and colleagues (Kagan, 1997; Kagan, Snidman, Zentner, & Peterson, 1999) utilizing a longitudinal sample, reported that 20% of children who had been classified as high reactive infants at 4 months of age, were classified as behaviorally inhibited children at 4 years of age. Subsequently, when these children were 7-years-old, they were found to be more vulnerable to the development of anxious symptoms. In addition, they were also found to be more subdued in their interactions with research examiners, and made fewer errors on a task requiring inhibition of reflex. Further follow-up indicated that when these behaviorally inhibited children were reassessed in early adolescence, they were significantly more likely than their behaviorally extroverted peers to be diagnosed with social anxiety, and more likely to be diagnosed with social anxiety rather than other anxiety disorders (Schwartz, Snidman, & Kagan, 1999).

Hayward, Killen, Kraemer, and Taylor (1998) reported similar findings in their examination of behavioral inhibition in childhood as a risk factor for the later
development of social phobia. Their findings indicated that retrospective reports of behavioral inhibition predicted the onset of social phobia during high school. More specifically, 22.3% of those individuals who reported being behaviorally inhibited as children, met criteria for social phobia as adolescents. This represents a risk more than four times greater than those individuals who did not report histories of behavioral inhibition.

Rubin, Burgess, and Hastings (2002) examined behavioral inhibition in early childhood and utilized a longitudinal design to examine whether inhibited temperament in toddlerhood would predict preschool aged children’s subsequent social and internalizing behavior problems. The results of this investigation indicated continuity of inhibition at age 2 to specific forms of socially wary behavior at age 4. In addition, modest correlations were reported between toddler behavioral inhibition and internalizing problems in preschool aged children.

These aforementioned studies, in addition to others (e.g., see reviews by Bates, 1989; Rothbart, Posner, & Hershey, 1995; Rothbart & Bates, 2006), have indicated a strong association between the temperament dimension of inhibition and internalizing adjustment problems in particular. Indeed, inhibited/withdrawn temperament is one of the most researched risk factors for the later development of anxiety disorders (Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2005). In light of such studies, several models proposed for the development of anxiety disorders have argued for the role of withdrawn or inhibited temperament as a construct of central importance (e.g., Chorpita & Barlow, 1998; Manassis & Bradley, 1994).
**Self-Regulation.** Self regulation refers to processes that may inhibit or facilitate reactivity and includes effortful control of attention (e.g., persistence, nondistractibility), emotions (e.g., self-soothing), and behavior (e.g., delay of gratification) (Rothbart, 1989). Self-regulation has been recognized as an important dimension of temperament that is often examined as a variable related to subsequent adjustment, more specifically, externalizing behavior problems (Bronson, 2000; Cole, Michel, & Teti, 1994).

Utilizing a typological approach to examine temperament structure, Robins and colleagues (Robins, John, Caspi, Moffitt, & Stouthamer-Loeber, 1996), identified three distinct personality “types” present in a group of American adolescent boys: resilient, overcontrolled, and undercontrolled. “Resilient” boys were those identified to respond adaptively and flexibly to situational demands, “overcontrolled” boys were those identified to respond in an inhibited manner, very introverted, yet agreeable, and more inclined to unnecessarily restrict their needs and impulses, and “undercontrolled” boys were those identified to respond in an impulsive and extroverted manner, oftentimes appearing restless and easily disrupted. When examining the associations between personality type and adjustment, Robins and colleagues found those teens identified as undercontrolled showed a general pattern of academic, behavioral, and emotional problems. More specifically, the undercontrolled adolescents performed poorly academically, engaged in significantly more serious forms of delinquency, and exhibited more externalizing behaviors than either of the other groups. In a very similar study, Hart, Hofmann, Edelstein, and Keller (1997) replicated the investigation conducted by Robins and colleagues (1996) with a sample of Icelandic youths. They identified the same three personality types: resilient, overcontrolled, and undercontrolled with similar
results. The undercontrolled youths differed significantly from those of the other two groups in their levels of aggressive behaviors and experienced more negative, aversive social interactions. Lastly, in another similar study, Newman, Caspi, Moffitt, and Silva (1997) examined whether temperamental differences at age 3 were linked to interpersonal adjustment in young adulthood. In the initial phase of this longitudinal study, Newman and colleagues identified five distinct groups of children (aged 3) based on behavioral observation: well-adjusted, undercontrolled, reserved, confident, and inhibited. Interpersonal outcomes across social contexts (i.e., social network, at home, in romantic relationships, and at work) were then assessed at age 21. The results indicated that those children who had been identified as “well-adjusted”, “reserved”, and “confident” at age 3 defined a heterogeneous range of normative adult interpersonal behavior. Those children who had been identified as “inhibited” at age 3 reported lower levels of social support, but normative adjustment of romantic relationships and at work, while those children identified as “undercontrolled” at age 3 reported lower levels of adjustment and greater interpersonal conflicts across all adult social contexts. Taken together, the results of these studies suggest that individuals with low self regulatory abilities are prone to a variety of problem behaviors, whether concurrently in childhood or in later adolescence or adulthood.

Eiden, Edwards, and Leonard (2007) examined the relationship between self regulation and externalizing behavior problems in a longitudinal study that assessed children’s self regulatory abilities at age 3 and externalizing behavior problems at age 3, as well as in kindergarten. The results indicated that self regulation predicted both concurrent problem behaviors, as well as externalizing problems in kindergarten, even
when controlling for stability in problem behaviors. More specifically, the data indicated that children who displayed poor self regulation skills in the preschool years were more likely to display externalizing problem behaviors when assessed in kindergarten.

In another longitudinal study examining the relationship between children’s self regulatory abilities and externalizing behavior problems, Hill, Degnan, Calkins, and Keane (2006) assessed children’s self regulation at age 2 and externalizing behavior problems at ages 2, 4, and 5. The results indicated that while most children followed the normative developmental pathway of externalizing behavior problems peaking at age 2 and showing a distinct decline with age (Tremblay, 2000), those girls with poor self regulatory abilities (i.e., poor emotion regulation and inattention) were most likely to exhibit high levels of externalizing behavior problems that were sustained across time. For boys, only inattention was predictive of a chronic-clinical longitudinal profile indicating externalizing behavior problems over time.

Olson, Sameroff, Kerr, Lopez, and Wellman (2005) examined associations between self regulation and externalizing behavior problems in a sample of 3-year-olds, controlling for co-occurring cognitive and social risk factors. The results indicated that toddlers’ self regulatory abilities were negatively associated with externalizing problem behavior in the early preschool period, despite the consideration of other influences such as cognitive and social risk factors, as well as other relevant child temperament traits such as irritable reactivity. The data from this investigation was unique in that the relationship between self regulation and externalizing behavior generalized across the reports of multiple informants (i.e., mothers, fathers, and teachers), in multiple
assessment settings (i.e., home and preschool), and with multiple measures of self regulation (i.e., behavioral observation and parent report).

In an investigation examining the role that children’s self regulation during the transition to kindergarten plays in children’s subsequent behavioral and academic performance in first grade, Suchodoletz and colleagues (Suchodoletz, Trommsdorff, Heikamp, Weiber, & Gollwitzer, 2009) reported results consistent with previous studies. The findings indicated that self regulation was predictive not only of classroom behavior, but academic performance as well. More specifically, greater self regulation in kindergarten was related to less externalizing behavior and higher academic performance in the first grade. This association remained, even after controlling for children’s cognitive abilities.

A number of additional studies have investigated the associations between children’s self regulation and adjustment and have yielded similar results. The extant literature has been fairly consistent in providing evidence of a negative relationship between children’s self regulation and externalizing behavior problems (Eisenberg, Spinrad, & Eggum, 2010). This association is evident in the toddler and preschool years (Kochanska, Barry, Aksan, & Boldt, 2008; Raaijmakers, Smidts, Sergeant, Maassen, Posthumus, & van Engeland, 2008; Rydell, Berlin, & Bohlin, 2003; Spinrad, Eisenberg, Gaertner, Popp, Smith, Kupfer, Greveng, Liew, & Hofer, 2007) as well as in numerous studies of school-aged children and adolescents (e.g., Eisenberg, Spinrad, Fabes, Reiser, & Cumberland, 2004; Eisenberg, Fabes, Guthrie, Murphy, Maszk, Holmgren, & Suh, 1996; Eisenberg, Guthrie, Fabes, Shepard, Losoya, Murphy, Jones, Poulin, & Reiser, 2000; Gardner, Dishion, & Connell, 2008; Krueger, Caspi, Moffitt, White, &
Stouthamer-Loeber, 1996; Lengua, 2008; Martel, Nigg, & VonEye, 2009; Oosterlaan & Sergeant, 1996).

Temperament, Molecular Family Stability, and Child Adjustment

As evidenced in the literature review presented thus far, both molecular family stability and temperament have empirically established relationships with child adjustment. While the establishment of these relationships provides a starting point for the examination of the development of problem behavior, further investigation is required to examine how these variables may influence child development.

One theory cited by temperament theorists and researchers is a vulnerability/resilience model, whereby the relationship between temperament and child adjustment is influenced by ecological and contextual factors (Nigg, 2006). As not every child with an inhibited temperament becomes an individual with an anxiety disorder, or every child low in self regulatory abilities becomes a dysregulated, aggressive individual, there are additional variables that must influence the ultimate pathway to adjustment despite early temperamental vulnerabilities. There has, however, been limited progress in detailing models of developmental interplay between temperament and environment, despite the large numbers of studies on temperament (Bates, Pettit, Dodge, & Ridge, 1998; Degnan, Almas, & Fox, 2010). In particular, there have been no studies conducted examining the relationship between temperament, molecular family stability, and child adjustment, however, there have been a few studies that have examined the relationship between temperament, other aspects of the family environment (i.e., various parenting and parental variables), and adjustment.
In one such study, Bates, Pettit, Dodge, and Ridge (1998) investigated the relationship between child temperament (i.e., impulsivity-unmanageability), parenting (i.e., restrictive control), and children’s externalizing behavior problems. Child temperament and parental restrictive control were assessed in infancy/toddlerhood and externalizing behavior was assessed at ages 7 to 11 years. The findings suggested that parental restrictive control (i.e., reactive efforts, such as prohibitions, warnings, and scoldings to manage inconvenient or potentially harmful child actions) moderated the relationship between early unmanageability and later externalizing behavior problems, such that those children who were rated high in impulsivity-unmanageability were more likely to display externalizing behavior problems when parental restrictive control was low, as compared to those who experienced high levels of parental restrictive control. In other words, the parenting variable of restrictive control acted as a protective factor against later externalizing behavior problems for those children with early self regulatory difficulties.

Similar findings were reported in a more recent study conducted by Karreman, Haas, Tuijl, Aken, and Dekovic (2010) in their examination of the relationships among temperament characteristics, parenting, and problem behavior in a sample of three-year-olds. Karreman and colleagues reported that impulsivity and anger were aspects of temperament found to be positively associated with externalizing problems. In addition to this relationship, impulsivity was also found to be negatively associated with internalizing problems. While several moderation models were examined, only the interaction effect of impulsivity and positive parental control for externalizing problem behavior was found to be statistically significant. This finding that positive parental
control (i.e., clearly setting limits, sensitive parenting, structuring the child’s environment) buffered the relationship between impulsivity and externalizing behavior problems lends further support to the idea of parenting variables acting as protective factors in the association between child temperament and child adjustment.

Further support for family environment acting as a protective factor was found by Coplan, Arbeau, and Armer (2008), who explored the moderating role of maternal personality and parenting characteristics in the relationship between shyness and adjustment in kindergartners. The authors speculated that “fretful” parenting (i.e., the combination of maternal neuroticism, behavioral inhibition system sensitivity, and overprotective parenting) would represent a maladaptive family environment for shy children and that “warm/supportive” parenting (i.e., maternal agreeableness and authoritative parenting style) would “buffer” shy children from negative adjustment outcomes. Similar to previous studies, shyness was associated with internalizing behavior problems, difficulties with peers and teachers, and lower perceived and demonstrated academic competence. Furthermore, the results indicated that the relationships between shyness and internalizing behavior problems were particularly pronounced among children with mothers higher in “fretful” parenting and lower in “warm/supportive” parenting.

Lastly, Williams and colleagues (Williams, Degnan, Perez-Edgar, Henderson, Rubin, Pine, Steinberg, & Fox, 2009) examined the impact of behavioral inhibition and parenting style on both internalizing and externalizing behavior problems from early childhood through adolescence. Behavioral inhibition was assessed at 14 and 24 months of age, parenting style (i.e., authoritative, authoritarian, and permissive/inconsistent) was
assessed at 7 years of age, and parental report of child internalizing and externalizing behavior problems was gathered at 4, 7, and 15 years of age. The results of this study indicated that toddlers with higher behavioral inhibition exhibited higher levels of internalizing behavior problems in preschool and maintained their level of internalizing problems across childhood and adolescence, when controlling for parenting style. In contrast, heightened levels of behavioral inhibition did not impact the level of externalizing behavior problems in preschool, but did contribute to a greater decline in these problems across childhood and adolescence. Further, the results suggested that greater authoritative parenting (i.e., warm, involved, clearly communicating, pleasant parenting) was associated with less of an increase in internalizing behavior problems over time, while greater authoritarian parenting (i.e., hostile, punishing, punitive, directive parenting) was associated with a steeper decline in children’s externalizing behavior problems. These results, in addition to those of the aforementioned studies, highlight the importance of considering parenting/family environment factors in the relationship between child temperament and child adjustment. While the empirical evidence is limited, the results that have been published thus far are supportive of parenting/family environment variables acting as protective factors to particular temperament vulnerabilities (e.g., Arcus et al., 1992; Bates et al., 1998; Coplan et al., 2008; Karreman et al., 2010; Park et al., 1997; Williams et al., 2009).

The Present Study

In the context of the literature reviewed above, the present study has several goals. The current investigation sought to explore and gather additional empirical support for the relationships between molecular family stability and child adjustment, as
well as child temperament and child adjustment. All three variables also were examined in the moderation model being proposed in this study, whereby molecular family stability is hypothesized to moderate the relationship between child temperament and child adjustment. These relationships were observed in a sample of kindergarten-age children, an age cohort hypothesized to be particularly developmentally salient and yet to be examined with regards to the relationship with family stability and the proposed moderation model.

As suggested in the literature review, molecular family stability has been examined in a wide range of age groups (i.e., children between the ages of 7 and 12 years old and college students between the ages of 18 and their mid-twenties) and results have suggested that molecular family stability is positively related to adjustment (Chalmers, 2005; Israel et al., 2001, 2002; Ivanova, 2002; Luft, 2006; Roderick, 2002; Sokolowski, 2008; Them, 2007). One major objective of the present study then, is to extend downward in age and replicate the findings of the investigative group’s previous studies regarding the relationship between molecular family stability and child adjustment. The exploration of family stability in a population of kindergarten students and their families presents an opportunity to examine potential early effects of family stability and the relationship(s) it may have with children’s psychosocial adjustment.

Family stability is hypothesized to be particularly salient for children during kindergarten, as this developmental period is often the first major transition in which children are expected to independently conform to a structured setting away from their home environment for an extended period of time. Despite the fact that more than half of the children in the United States reportedly attended preschool (National Center for
Education Statistics, 1998; U.S. Census Bureau, 2000), kindergarten remains a distinct period of adjustment to increased academic expectation, as well as expectation to practice attentional, behavioral, and emotional self-regulation, exhibition of pro-social skills, and conformity to school regulations (Duda & Minick, 2006; Ladd & Price, 1987; Rimm-Kaufman, Pianta, & Cox, 2000). The number of changes experienced during this transition period, as well as the increased demands placed upon children’s resources, are likely to result in a child’s greater reliance upon the stability and support from their home environment.

Family stability is also hypothesized to play a predominate role in children’s lives during this developmental period as kindergarten children continue to be highly dependent upon their parents to create the experiences they will learn from and the environment to which they will react. Whereas older children may be able to find other individuals to provide such support or independently create some facet of their life in which they feel a sense of control, kindergartners continue to rely significantly upon parental facilitation to develop self-regulatory and coping skills necessary to succeed in school, more so than in later developmental periods (Keenan, 2000). Research has suggested that young children with parents who are able to provide a home environment which supports the practice of children’s efforts at self-regulation, via consistent and predictable routines thought to encourage and allow planful and goal-directed behavior to emerge, perform better academically and exhibit lower levels of both internalizing and externalizing behavior (Brody & Flor, 1997). The exact mechanisms as to how family stability serves as a protective factor and facilitator of positive child adjustment remain unclear. However, research does suggest the relationship is a salient one during this
developmental period and worthy of further examination (Coplan, Arbeau, & Armer, 2008; Rimm-Kaufman & Pianta, 2000; Wildenger, McIntyre, Fiese, & Eckert, 2008). To summarize, due to the number of changes children experience during kindergarten, as well as the increased demands placed upon their resources, and the high level of children’s dependence on their parents to organize their worlds, it is hypothesized that the stability and support from the home environment plays a significant role at this time. More specifically, it is hypothesized that higher levels of molecular family stability (i.e., a more predictable/routinized family environment) will be associated with more positive child adjustment (i.e., fewer internalizing, externalizing, and total problems).

Another major objective of the present study is to replicate the findings of much of the temperament literature regarding the relationship between child temperament and child adjustment. Inhibition and self regulation were selected to be examined as temperament risk factors related to children’s adjustment to kindergarten transition as both are thought to be dimensions of temperament particularly sensitive to, and affected by, the onslaught of novelty and increased regulatory expectations brought about by this developmental period. In particular, the unfamiliarity of the new environment (e.g., new authority figures, new peers, new/increased academic, social, emotional, and behavioral expectations and demands, etc.) is thought to exacerbate the influence of the temperament dimension inhibition on children’s adjustment. Specifically, it is hypothesized that the novelty of kindergarten transition may be overwhelming for those children on the more reticent end of the inhibition spectrum, thereby increasing their temperamental tendency to turn inward, leading to greater internalizing behavior problems. Similarly, the increased regulatory expectations of kindergarten transition are thought to exacerbate the
influence of the temperament dimension self regulation on children’s adjustment. Specifically, it is hypothesized that the increased regulatory expectations of kindergarten transition may be too restrictive for those children on the more under-regulated end of the self regulation spectrum, thereby increasing their temperamental tendency to be dysregulated, leading to greater externalizing behavior problems.

Although both molecular family stability and child temperament have been found to be significantly related to child psychosocial outcome, the mechanisms through which these variables may interact has not been empirically examined. One model suggested in the literature review views family environment/parenting variables as serving a protective role by attenuating the influence of child temperament on children’s behavior problems (e.g., Arcus et al., 1992; Bates et al., 1998; Coplan et al., 2008; Karreman et al., 2010; Park et al., 1997; Williams et al., 2009). With this empirical data and model as support, the current investigation hypothesizes that molecular family stability (as a family environment/parenting variable) may act as a moderator between child temperament and adjustment, such that the relationship between child temperament and child adjustment varies depending upon the level of molecular family stability present. A previous study conducted by Chalmers (2005) supports the assumption of molecular family stability being viewed as a parenting behavior, as molecular family stability was found to be associated with two established parenting variables: consistent/effective discipline and parental monitoring.

In addition to the contribution to the research literature, the examination of a possible mechanism through which molecular family stability ultimately influences child outcome may help to advance the clinical applicability of findings to thereby increase the
effectiveness of intervention and prevention efforts. This is particularly salient to the population being examined as research has suggested that early school problems (i.e., behavioral, social, and academic) remain remarkably stable and often forecast later school success and achievement (Rimm-Kaufman & Kagan, 2005; Rimm-Kaufman & Pianta, 2000). Therefore, early recognition, intervention, and/or prevention are key to directing children’s school performance towards a positive and successful trajectory.

Based on the research literature reviewed in the preceding sections, the specific hypotheses to be explored in the present investigation are as follows:

1. Molecular family stability will be predictive of child psychosocial adjustment. Specifically, it is hypothesized that:
   a. Greater levels of molecular family stability will predict lesser levels of parent- and teacher-reported child internalizing behavior problems.
   b. Greater levels of molecular family stability will predict lesser levels of parent- and teacher-reported child externalizing behavior problems.

2. The child temperament dimension of inhibition will be predictive of child psychosocial adjustment. Specifically, it is hypothesized that:
   a. Greater levels of inhibition will predict higher levels of parent- and teacher-reported child internalizing behavior problems.
   b. To a lesser degree, greater levels of inhibition will predict lower levels of parent- and teacher-reported child externalizing behavior problems.
3. The child temperament dimension of self regulation will be predictive of child psychosocial adjustment. Specifically, it is hypothesized that:
   a. Greater levels of self regulation will predict lower levels of parent- and teacher-reported child externalizing behavior problems.
   b. To a lesser degree, greater levels of self regulation will predict higher levels of parent- and teacher-reported child internalizing behavior problems.

4. Molecular family stability plays a moderating role in the relationship between child temperament and child adjustment. Specifically, it is hypothesized that:
   a. At higher levels of family stability, the relationship between child inhibition and both parent- and teacher-reported child internalizing behavior problems will be significantly reduced.
   b. At higher levels of family stability, the relationship between child self regulation and both parent- and teacher-reported child externalizing behavior problems will be significantly reduced.

5. Since the relationship between the child temperament dimension of inhibition and child externalizing behavior problems is being examined in an exploratory manner, similarly the hypothesis regarding moderation is also tentative.

6. Since the relationship between the child temperament dimension of self regulation and child internalizing behavior problems is being examined in an exploratory manner, similarly the hypothesis regarding moderation is also
tentative.
Chapter II

Methods
Participants

Information was collected with regard to 125 kindergarten students (64 boys and 61 girls) recruited from several elementary schools in a suburban school district, located outside of a large city in a southwestern state. The sample size was determined by a power analysis with the effect size set at .15 and the desired power set at .80, a commonly cited conventional level of power (Cohen & Cohen, 1983).

The majority of the 125 parent participants identified themselves as biological mothers of the child participant (n=113), 6 as biological fathers, and 6 as guardians. Parental reports regarding the number of years the child spent attending daycare and/or preschool indicated that 40 (32%) of the kindergarten students had spent 0 to 1 year, 32 (26%) had spent 1 to 2 years, 15 (12%) had spent 2 to 3 years, 15 (12%) had spent 3 to 4 years, and 23 (18%) had spent 4 to 5 years attending daycare and/or preschool outside of the home prior to beginning kindergarten.

The children were all under six years of age, more specifically they ranged from five years-and-six months to five years-and-eleven months of age ($M = 69.69$ months, $SD = 1.84$). The parents ranged in age from 23 to 54 years of age ($M = 35.49$ years, $SD = 5.60$). In terms of marital status, 99 (79%) parents reported themselves as currently married, 11 (9%) as divorced, 12 (10%) as single-never married, and 3 (2%) as "Other" (e.g., separated, engaged, not reported).

In terms of ethnicity, a majority of the participants, 105 (84%), identified themselves as Caucasian, while 4 (3%) participants identified themselves as African-American, 12 (10%) as Hispanic/Latino, and 4 (3%) as “Other” (i.e., often bi-, or multi-racial). When asked to report their child’s ethnicity, a majority of the participants, 94
(75%) identified their children as Caucasian, while 3 (2%) participants identified their children as African-American, 17 (14%) as Hispanic/Latino, 1 (1%) as Asian or Pacific Islander, and 10 (8%) as “Other” (i.e., often bi-, or multi-racial).

In the current sample, the total estimated household yearly income ranged from $0 to over $200,000. More specifically, reports of total estimated household yearly income were as follows: 2 (2%) participants reported income less than $10,000, 4 (3%) participants reported income ranging from $10,000 to $14,999, 8 (6%) participants reported income ranging from $15,000 to $24,999, 9 (7%) participants reported income ranging from $25,000 to $34,999, 19 (15%) participants reported income ranging from $35,000 to $49,999, 25 (19%) participants reported income ranging from $50,000 to $74,999, 27 (22%) participants reported income ranging from $75,000 to $99,999, 28 (23%) participants reported income ranging from $100,000 to $149,999, 1 (1%) participant reported income ranging from $150,000 to $199,999, 1 (1%) participant reported income of $200,000 or more, and 1 (1%) participant did not report their total estimated household yearly income. For data analytic purposes, however, income groups were coded into the following five categories: (1) under $34,999 (n=23, 19%); (2) from $35,000 to $49,999 (n=19, 15%); (3) from $50,000 to $74,999 (n=25, 20%); (4) from $75,000 to $99,999 (n=27, 22%); (5) greater than $100,000 (n=30, 24%).

Sixty-nine teachers provided the teacher-reports of child adjustment in the current sample. Statistically, the subset of the sample which contained both parent- and teacher-reports of child adjustment (n=69) were not found to differ from the subset of the sample which contained only parent-reports of child adjustment (n=56) on any demographic (i.e., child age, child sex, pre-kindergarten experience, and estimated household yearly
income) or study (i.e., molecular family stability, child temperament, and parent-reported child adjustment) variable.

Measures

Demographics. A questionnaire was developed for parents to report demographic characteristics of the participating family. Parents were asked questions pertaining to the sex, age, and ethnicity of the child, as well as their own age, ethnicity, relationship to the child participant, the family income level, current household composition, and the child participant’s pre-kindergarten experience with daycare or preschool.

Stability of Activities in the Family Environment-Parent version (SAFE-P). The SAFE-P is a parent report version of the SAFE (Israel & Roderick, 2001; Israel, Roderick, & Ivanova, 2002) and is a 23-item questionnaire that assesses the degree of regularity of family activities both within and outside of the home (SAFE stability), as well as the degree to which the regularity of the activities is perceived as positive (SAFE liking). Higher values indicate greater stability or greater liking. A third score, SAFE stable positive, is conceptually thought of as an integration of the information reflected in both the stability and liking ratings. That is, the SAFE stable positive score reflects only the stability of activities that were perceived as positive. Calculation of the SAFE stable positive score is based upon individually determined stability items rated by the participant as 2 or greater on the liking scale (i.e., items endorsed as liked). The stability ratings that the participant assigned to each of these positive activities is then summed for a total SAFE stable positive score.

The present study included analyses utilizing both the total stability and stable-positive scores. Each item in the stability portion of the parent measure is rated by
participants on a 7-point Likert scale, ranging from 0 (“not at all”) to 6 (“extremely”).
For instance, one question asked, “How regular is the mealtime routine in your house?”
In the liking portion of the parent measure the parent’s perception of the child’s liking of
the regularity for each item is also rated by the parent on a 7-point Likert scale, ranging
from 0 (“not at all”) to 6 (“very much”). For example, participants were asked, “How
much does your child like or dislike the regularity of the mealtime routine in your
house?” The individual items are then summed for a total stability score or stable
positive score with a potential range from 0 to 138.

A recent investigation examining the psychometric properties of the SAFE-P
indicated that the measure demonstrated satisfactory internal consistency, with
Cronbach’s alphas of .76 for the total stability score and .79 for the stable positive score,
as well as good test-retest reliability, with a test-retest reliability coefficient of .86 for the
total stability score and .83 for the stable positive score (Israel, Ivanova, Roderick,
Sokolowski, Chalmers, & Them, 2010). The validity of the SAFE-P has been suggested
by its significant relationships to measures of child adjustment as well as maternal sense
of competence, parental monitoring and discipline, daily hassles, and stressful life events
(Chalmers, 2005; Ivanova & Israel, 2006; Roderick, 2002).

*Children’s Behavior Questionnaire- Very Short Form (CBQ-VSF).* The CBQ-VSF
(Putnam & Rothbart, 2006) is a pared down version of the well-established and widely
utilized Children’s Behavior Questionnaire (CBQ; Rothbart, Ahadi, & Hershey, 1994;
Rothbart, Ahadi, Hershey, & Fisher, 2001) developed specifically for the efficient
measurement of three empirically derived and theoretically informative broad aspects of
temperament (i.e., Surgency/Extraversion, Negative Affectivity, and Effortful Control) in
children between the ages of 3 and 8 (Rothbart, Ahadi, & Evans, 2000; Zentner & Bates, 2008; Morris, Silk, Steinberg, Sessa, Avenevoli, & Essex, 2002; Grist & McCord, 2010). The CBQ-VSF contains 36 items, for which parents (using a seven-point Likert scale) rate how well the statement describes their child, with 1 indicating that the statement is “extremely untrue of my child” and 7 indicating that the statement is “extremely true of my child”. Parents are also directed to indicate whether an item is “not applicable” because they have never witnessed their child in the specified situation. The present study utilized only two of the three broad factor scores: Surgency (whereby the constructs and scale scores defining this factor are consistent with the temperament dimension referred to as inhibition throughout the literature review) with higher scores indicating decreased levels of inhibition and Effortful Control (whereby the constructs and scale scores defining this factor are consistent with the temperament dimension referred to as self regulation throughout the literature review) with higher scores indicating increased self regulation.

The CBQ-VSF has demonstrated satisfactory internal consistency for both Surgency and Effortful Control, with Cronbach’s alphas of .75 and .74, respectively. It has also exhibited longitudinal stability with test-retest reliability coefficients of .73 for Surgency and .63 for Effortful Control (Putnam & Rothbart, 2006). Although considerably smaller than those test-retest reliability coefficients typically sought by questionnaire creators, they were higher than stability correlations for temperament in early childhood over comparable intervals as reported in previous studies (Geurin & Gottfried, 1994).
Child Behavior Checklist (CBCL/1½-5). The CBCL/1½-5 (Achenbach & Rescorla, 2000) is a well-established 99-item parent-report measure of behavior problems and child competencies for children between the ages of 1½ and 5 years. Each item is rated on a three-point Likert scale, ranging from 0 (“not true of my child”) to 2 (“very true of my child”). The CBCL/1½-5 yields a total problems scale, internalizing and externalizing broadband syndrome scores, and seven narrowband syndrome scores (i.e., Emotionally Reactive; Anxious/Depressed; Somatic Complaints; Withdrawn; Sleep Problems; Attention Problems; Aggressive). For the present study, analyses were performed utilizing only the internalizing and externalizing broadband scores.

The CBCL/1½-5 has been demonstrated to have strong psychometric properties (Achenbach & Rescorla, 2000). The CBCL/1½-5 has demonstrated test-retest coefficients of .90 for internalizing behavior problem scores and .87 for externalizing behavior problem scores. In addition, the measure has demonstrated excellent internal consistency with Cronbach’s alphas of .89 for the internalizing and .92 for the externalizing problems scales. Validity is suggested from a comparison of demographically-matched referred and non-referred samples that differed significantly on all CBCL/1½-5 scales and items. Furthermore, children with subclinical/clinical internalizing and externalizing scores were five and six times more likely, respectively, to be clinically referred than children with lower scores (Achenbach & Rescorla, 2000).

Caregiver-Teacher Report Form (C-TRF). The C-TRF (Achenbach & Rescorla, 2000) is a well-established 99-item caregiver/teacher-report measure of behavior problems and child competencies for children between the ages of 1½ and 5 years developed as an analogue to the CBCL/1½-5. Similarly, each item is rated on a three-
point Likert scale, ranging from 0 (“not true”) to 2 (“very true”). The C-TRF also yields
the same scores as the CBCL/1½-5, with the exception of the Sleep Problems scale. For
the present study, analyses were performed utilizing only the internalizing and
externalizing broadband scores.

As with the CBCL/1½-5, the C-TRF has been demonstrated to have strong
psychometric properties (Achenbach & Rescorla, 2000). The C-TRF has demonstrated
test-retest coefficients of .77 for internalizing behavior problems and .89 for externalizing
behavior problems as well as excellent internal consistency with Cronbach’s alphas of .89
and .96 for the internalizing and externalizing problems scales, respectively.

Procedures

Parents of kindergarteners were invited to participate in the study via a cover
letter briefly introducing the researchers and the project. This cover letter was
accompanied by an informed consent document, informing parents of their rights as
research participants (e.g., that participation was voluntary and could be discontinued at
anytime and that responses would remain confidential), a teacher release form (i.e.,
giving parental consent to allow their child’s teacher to complete a child adjustment
measure), and a contact information sheet (i.e., names, address, and telephone number).
Parents expressing interest in participating in the study were asked to sign both the
informed consent and teacher release forms, as well as complete the contact information
sheet, and return all three forms in a pre-addressed, stamped envelope.

Upon receipt of these forms, a packet of materials including the parent measures
and a stamped and labeled return envelope was then mailed to the parent. In addition, a
copy of the teacher-report of child adjustment was submitted to the participating child’s
teacher for completion.

In appreciation of their cooperation each participating family and teacher was
entered into a random drawing for one of nine Visa gift cards.
All procedures followed guidelines for research with human participants and were
approved by the University’s Institutional Review Board.
Chapter III

Results
Preliminary Analyses

Prior to statistical analyses regarding the hypotheses of the present investigation, the data were screened for missing data and preliminary evaluations for the assumptions of normality, linearity, and homoscedasticity were performed. All 125 cases had completed parent reports (although in one of these cases the parent did not complete the "regularity" portion of the SAFE, and in two of these cases the parents did not complete the "liking" portion of the SAFE). Of the 125 total cases, 69 cases had corresponding teacher reports. Assumptions of normality, linearity, and homoscedasticity were supported, with the exception of the distributions of the C-TRF Internalizing raw scores and C-TRF Externalizing raw scores. Both distributions were significantly positively skewed ($z = 2.03$ and $z = 2.14$, respectively) and kurtotic ($z = 3.97$ and $z = 4.46$, respectively), suggesting that teachers in the present sample generally reported child internalizing and externalizing problems at levels below the present sample means and that more of the variance in scores is likely due to the result of infrequent extreme deviation as opposed to frequent modestly-sized deviations. The distributions of the C-TRF $T$-scores, however, were not significantly skewed or kurtotic, and as further analyses did not indicate any differences in the patterns of the bivariate correlations of the C-TRF raw and $T$-scores with the other variables, the raw scores were used in the analysis of the hypotheses.

The data were also analyzed for associations between the main study variables and the demographic variables, of child sex, child age, pre-kindergarten experience, and total annual household income. Independent sample $t$-tests were performed to examine possible sex differences. Significant differences between male and female children were
found with regard to parent-reported child effortful control/self regulation and teacher-reported child externalizing behavior problems. More specifically, parents reported female children as having greater self regulatory abilities as compared to male children \((t = -3.63, \ p < .01)\) and teachers reported higher levels of externalizing behavior problems in male children as compared to female children \((t = 2.79, \ p < .01)\). There were no significant sex differences with regard to other study variables.

The demographic variables of age and pre kindergarten experience were analyzed via correlational analyses. No statistically significant correlations emerged, suggesting that neither child age nor pre kindergarten experience are associated with the study variables. Correlations were also used to explore possible relationships between total annual household income and the study variables. Analyses indicated statistically significant relationships between household income and both the SAFE total stability score \((r = .27, \ p < .01)\) and the SAFE stable positive score \((r = .30, \ p < .01)\). More specifically, greater annual household income was associated with higher levels of parent-reported family stability.

As preliminary analyses indicated significant sex differences in parent-reported child effortful control/self regulation and teacher-reported child externalizing behavior problems, and a significant association between family stability and total annual household income, parallel regression analyses were conducted for all subsequent regression analyses involving these reported variables. One regression was performed controlling for the effect of the demographic variable and one regression was performed without controlling for the effect of the demographic variable. As the analyses that accounted for the effect(s) of the demographic variable(s) appeared to provide a more
comprehensive picture of the nature of the relationships and did not change the overall outcome of any analyses, a conservative approach was taken and all regression results described hereafter reflect the consideration of these subject variables.

**Descriptive Statistics**

Means and standard deviations of the measures of molecular family stability (SAFE-P) and child temperament (CBQ-VSF) are presented in Table 1. (As noted at the bottom of Table 1, higher scores on the CBQ-VSF: Surgency scale indicate increased levels of *surgency* and, therefore, decreased levels of *inhibition*).

The current means and standard deviations of the SAFE-P were similar to those found in previous investigations of this measure in nonclinical samples (Chalmers, 2005; Roderick, 2002; Sokolowski, 2008; Them, 2007; A. Israel, personal communication, October 21, 2011). In addition, the SAFE-P continued to demonstrate satisfactory internal consistency, with Cronbach’s alphas of .83 for the total stability score and .86 for the stable positive score.

The means and standard deviations, as well as the current sample Cronbach’s alphas for both Surgency (α = .77) and Effortful Control/Self Regulation (α = .70), of the CBQ-VSF were also comparable to those of the nonclinical samples used in the development of the measure (Putnam & Rothbart, 2006; Rothbart et al., 2001).

The means and standard deviations for the measures of child adjustment (CBCL/1½-5 and C-TRF) are presented in Table 2. The current mean T-scores for the CBCL/1½-5 and C-TRF all fell in the average range. Overall, however, the mean raw scores and mean T-scores for the present sample were consistently approximately one-half standard deviation less than the mean raw scores and mean T-scores for the samples.
used in the development of the measure, indicating that parents and teachers in the present study reported fewer child adjustment problems (both internalizing and externalizing) in comparison to those of the normative sample (Achenbach & Rescorla, 2000).

Correlational Analyses

Bivariate correlations among the molecular family stability (SAFE-P), child temperament (CBQ-VSF), and child adjustment (CBCL/1½-5 and C-TRF) measures are presented in Table 3. A number of the hypotheses regarding bivariate relationships were not supported.

With regard to the relationship between molecular family stability and child adjustment, all correlations were in the predicted direction (i.e., greater family stability was associated with lower internalizing and externalizing problems). However, only one correlation, between the SAFE-P Stable Positive scores and the CBCL/1½-5 Externalizing behavior problems scores, reached a level of statistical significance ($r = -0.16$, $p<.05$).

The correlations of both the parent- and teacher-reported child internalizing behavior problems with the parent-reports of both child surgency/inhibition and child effortful control/self regulation were not in the hypothesized direction. Based on previous literature it was predicted that CBQ-VSF Surgency scores would be negatively correlated with child internalizing behavior problems scores, such that as child surgency decreased (alternatively indicating increased child inhibition) child internalizing behavior problems would increase. It was also predicted that CBQ-VSF Effortful Control/Self Regulation scores would be positively correlated with child internalizing behavior
problems scores, such that as child effortful control/self regulation increased so too would child internalizing behavior problems. In the case of parent-reported child internalizing behavior problems and the measures of child temperament, the correlations were of small enough magnitude that they may functionally be considered of zero-order magnitude rather than the hypothesized positive correlation. However, the correlations regarding teacher-reported child internalizing behavior problems and child temperament were more robust but opposite to the predicted directions. There was a statistically significant positive correlation between the C-TRF Internalizing Behavior Problems scale and the CBQ-VSF Surgency scale and a statistically significant negative correlation between the C-TRF Internalizing Behavior Problems scale and the CBQ-VSF Effortful Control/Self Regulation scale. In other words, contrary to predictions, the findings indicated that lower levels of child surgency (or higher levels of child inhibition) and higher levels of child effortful control/self regulation were associated with lower child internalizing behavior problems.

The hypotheses regarding the relationships between child temperament and child externalizing behavior problems were supported by statistically significant correlations indicating that (1) lower levels of surgency (or greater levels of inhibition) were related to lower levels of both parent- and teacher-reported child externalizing behavior problems; and that (2) greater levels of effortful control/self regulation were related to lower levels of both parent- and teacher-reported child externalizing behavior problems.

In addition to the correlational analyses regarding the hypotheses of the present investigation, several other notable correlational findings were observed. One such association worth noting was the similarity of the correlations between the CBQ-VSF
Surgency scale and the CBQ-VSF Effortful Control/Self Regulation scale found in the current sample (i.e., $r = -.18, p < .05$) with that of the correlations reported from the samples used in the development of the measure (i.e., $r = -.19, p < .01$ and $r = -.10, p < .05$; Putnam & Rothbart, 2006).

The correlations examining the levels of parent and teacher agreement regarding child behavior problems in the current investigation, as well as the comparison of this parent-teacher agreement with that found in the samples used in the development of the measure are also noteworthy. The cross-informant agreement on child internalizing behavior problems for the current sample was a non-statistically-significant finding of $r = .03, p = .39$, whereas the cross-informant agreement on child externalizing behavior problems was $r = .40, p < .01$. Comparatively, parent-teacher agreement on child internalizing behavior problems reported for the sample used in the development of the Achenbach measures (i.e., CBCL/1½-5 and C-TRF) was $r = .30, p < .01$ and parent-teacher agreement on child externalizing behavior problems was $r = .58, p < .01$ (Achenbach & Rescorla, 2000).

Lastly, correlations among the study variables were also examined separately by child sex. A number of differences among the correlations involving child temperament and child adjustment variables can be observed between the sexes, as displayed in Tables 4 and 5. Most notably are the sex differences observed among the correlations between molecular family stability and child temperament, as well as the correlations between child temperament and child adjustment.

In the associations between the SAFE-P: Total Stability and SAFE-P: Stable Positive Scores with the CBQ-VSF: Surgency and CBQ-VSF: Self Control/Self
Regulation Scores, the positive correlations all approached significance for male children but did not for female children. However, the correlations among the measures of child temperament and teacher reports of child adjustment indicated that while there were strong and statistically significant relationships between both child temperament variables with teacher-reported adjustment (both internalizing and externalizing behavior problems) for female children, none of these relationships were found to be significant for male children. These results suggest that there may be relationships among the variables of molecular family stability, child temperament, and child adjustment that vary by sex in this developmental period.

*Product Term Regression Analyses Testing the Moderation Model*

The central hypothesis of the present investigation, which proposes that molecular family stability moderates the relationship between child temperament and child adjustment, was analyzed using the product term regression analysis procedures set forth by Jaccard and Turrisi (2003). Four series of multiple regression analyses were conducted, the first examined molecular family stability as a moderator of the relationship between child surgency/inhibition and child internalizing behavior problems, the second examined molecular family stability as a moderator of the relationship between child effortful control/self regulation and child externalizing behavior problems, the third was an exploratory examination of molecular family stability as a moderator of the relationship between child surgency/inhibition and child externalizing behavior problems, and the fourth was an exploratory examination of molecular family stability as a moderator of the relationship between child effortful control/self regulation and child internalizing behavior problems. Each of these series of multiple regression analyses was
conducted twice, once utilizing the parent-report of adjustment (i.e., CBCL/1½-5) and once utilizing the teacher-report of adjustment (i.e., C-TRF).

Prior to performing the multiple regression analyses, all predictor variables (i.e., molecular family stability, as measured by the SAFE Total score, and child temperament, as measured by either the CBQ-VSF Surgency or CBQ-VSF Effortful Control/Self Regulation score) were mean-centered to control for the effects of multicollinearity as suggested by Jaccard and Turrisi (2003).

Generally speaking, in the first step of the multiple regression analyses, the moderation model is tested by regressing the dependent variable (i.e., child adjustment) on both the predictor variable (i.e., child temperament) and the proposed moderator variable (i.e., molecular family stability). Next, the full interaction moderation model is tested by regressing the dependent variable on the predictor variable, the proposed moderator variable, and the product term of the predictor and moderator variables (i.e., child temperament x molecular family stability). When the full interaction model is found to be statistically significant (as indicated by the omnibus F test) and the regression coefficient for the product term indicates that the interaction effect is a significant predictor of the dependent variable, moderation is inferred.

*Molecular family stability as a moderator of the relationship between child surgency/inhibition and parent-reported child internalizing behavior problems.* In the first series of multiple regression analyses conducted, molecular family stability was first examined as a moderator of the relationship between child surgency/inhibition and parent-reported child internalizing behavior problems. The findings of this analysis are summarized in Table 6. First, parent-reported child internalizing behavior problems were
regressed both on child surgency/inhibition and molecular family stability in step one, and the product of child surgency/inhibition with molecular family stability was entered in step two. The squared multiple correlation for the interaction model was 0.044 ($F(4,118) = 1.37, p = .249$; standard error of the estimate = 6.34), indicating a non-significant model. This finding suggests that the interaction between child surgency/inhibition and molecular family stability does not significantly impact parent-reported child internalizing behavior problems.

*Molecular family stability as a moderator of the relationship between child surgency/inhibition and teacher-reported child internalizing behavior problems.* In the second part of the first series of multiple regression analyses conducted, molecular family stability was examined as a moderator of the relationship between child surgency/inhibition and teacher-reported child internalizing behavior problems. The findings of this analysis are summarized in Table 7. First, teacher-reported child internalizing behavior problems were regressed both on child surgency/inhibition and molecular family stability in step one, and the product of child surgency/inhibition with molecular family stability was entered in step two. The squared multiple correlation for the interaction model was 0.100 ($F(4,62) = 1.726, p = .156$; standard error of the estimate = 5.33), indicating a non-significant model. This finding suggests that the interaction between child surgency/inhibition and molecular family stability does not significantly impact teacher-reported child internalizing behavior problems.

*Molecular family stability as a moderator of the relationship between child effortful control/self regulation and parent-reported child externalizing behavior problems.* In the second series of multiple regression analyses conducted, molecular
family stability was first examined as a moderator of the relationship between child
effortful control/self regulation and parent-reported child externalizing behavior
problems. The findings of this analysis are summarized in Table 8. First, parent-reported
child externalizing behavior problems were regressed both on child effortful control/self
regulation and molecular family stability in step one, and the product of child effortful
control/self regulation with molecular family stability was entered in step two. The
squared multiple correlation for the interaction model was 0.036 (F(5,117) = 1.905, \( p =
.099 \); standard error of the estimate = 7.73), indicating a non-significant model. This
finding suggests that the interaction between child effortful control/self regulation and
molecular family stability does not significantly impact parent-reported child
externalizing behavior problems.

Molecular family stability as a moderator of the relationship between child
effortful control/self regulation and teacher-reported child externalizing behavior
problems. In the second part of the second series of multiple regression analyses
conducted, molecular family stability was examined as a moderator of the relationship
between child effortful control/self regulation and teacher-reported child externalizing
behavior problems. The findings of this analysis are summarized in Table 9. First,
teacher-reported child externalizing behavior problems were regressed both on child
effortful control/self regulation and molecular family stability in step one, and the
product of child effortful control/self regulation with molecular family stability was
entered in step two. The squared multiple correlation for the interaction model was 0.101
(F(5,61) = 2.487, \( p = .041 \); standard error of the estimate = 7.44). The regression
coefficient for the product term was -.074 (\( p = .435 \); 95% CI = -.264 to .115), indicating a
non-significant interaction effect. While the full interaction model was found to be significant, the lack of statistical significance of the product term suggests that the interaction between child effortful control/self regulation and molecular family stability does not significantly impact teacher-reported child externalizing behavior problems.

*Molecular family stability as a moderator of the relationship between child surgency/inhibition and parent-reported child externalizing behavior problems.* In the third series of multiple regression analyses conducted, molecular family stability was first examined as a moderator of the relationship between child surgency/inhibition and parent-reported child externalizing behavior problems. The findings of this analysis are summarized in Table 10. First, parent-reported child externalizing behavior problems were regressed both on child surgency/inhibition and molecular family stability in step one, and the product of child surgency/inhibition with molecular family stability was entered in step two. The squared multiple correlation for the interaction model was 0.155 (F(4, 118) = 5.401, p < .001; standard error of the estimate = 7.36). The regression coefficient for the product term was .025 (p = .641; 95% CI = -.079 to .128), indicating a non-significant interaction effect. While the full interaction model was found to be significant, the lack of statistical significance of the product term suggests that the interaction between child surgency/inhibition and molecular family stability does not significantly impact parent-reported child externalizing behavior problems.

*Molecular family stability as a moderator of the relationship between child surgency/inhibition and teacher-reported child externalizing behavior problems.* In the second part of the third series of multiple regression analyses conducted, molecular family stability was examined as a moderator of the relationship between child
surgency/inhibition and teacher-reported child externalizing behavior problems. The findings of this analysis are summarized in Table 11. First, teacher-reported child externalizing behavior problems were regressed both on child surgency/inhibition and molecular family stability in step one, and the product of child surgency/inhibition with molecular family stability was entered in step two. The squared multiple correlation for the interaction model was 0.232 (F(5,61) = 3.677, \( p = .006 \); standard error of the estimate = 7.16). The regression coefficient for the product term was .171 (\( p = .062 \); 95% CI = .011 to .346), indicating a non-significant interaction effect. While the full interaction model was found to be significant, the lack of statistical significance of the product term suggests that the interaction between child surgency/inhibition and molecular family stability does not significantly impact teacher-reported child externalizing behavior problems.

_Molecular family stability as a moderator of the relationship between child effortful control/self regulation and parent-reported child internalizing behavior problems._ In the fourth series of multiple regression analyses conducted, molecular family stability was first examined as a moderator of the relationship between child effortful control/self regulation and parent-reported child internalizing behavior problems. The findings of this analysis are summarized in Table 12. First, parent-reported child internalizing behavior problems were regressed both on child effortful control/self regulation and molecular family stability in step one, and the product of child effortful control/self regulation with molecular family stability was entered in step two. The squared multiple correlation for the interaction model was 0.028 (F(5,117) = 0.666, \( p = .650 \); standard error of the estimate = 6.42), indicating a non-significant model. This
finding suggests that the interaction between child effortful control/self regulation and molecular family stability does not significantly impact parent-reported child internalizing behavior problems.

Molecular family stability as a moderator of the relationship between child effortful control/self regulation and teacher-reported child internalizing behavior problems. In the second part of the fourth series of multiple regression analyses conducted, molecular family stability was examined as a moderator of the relationship between child effortful control/self regulation and teacher-reported child internalizing behavior problems. The findings of this analysis are summarized in Table 13. First, teacher-reported child internalizing behavior problems were regressed both on child effortful control/self regulation and molecular family stability in step one, and the product of child effortful control/self regulation with molecular family stability was entered in step two. The squared multiple correlation for the interaction model was 0.096 (F(5,61) = 1.295, p = .278; standard error of the estimate = 5.39), indicating a non-significant model. This finding suggests that the interaction between child effortful control/self regulation and molecular family stability does not significantly impact teacher-reported child internalizing behavior problems.
Chapter IV

Discussion
The purpose of the present investigation was to explore and gather additional empirical support for the relationships between molecular family stability and child adjustment, and child temperament and child adjustment, as well as explore the possible relationship(s) among molecular family stability, child temperament and child adjustment. The first major objective of the present study was to extend downward in age and replicate the findings of the investigative group’s previous research regarding the relationship between molecular family stability and child adjustment. The exploration of family stability in a population of kindergarten students and their families presented an opportunity to examine potential early effects of family stability and the relationship it has with children’s psychosocial adjustment. Another major objective of the present study was to replicate the findings of much of the temperament literature regarding the relationship between child temperament and child adjustment. Inhibition and self regulation were selected to be examined as temperament risk factors related to children’s adjustment to kindergarten transition as both were thought to be dimensions of temperament particularly sensitive to, and affected by, the onslaught of novelty and increased regulatory expectations brought about by this developmental period. Lastly, as suggested by a review of the current literature, whereby family environment/parenting variables have been shown to serve a protective role by attenuating the influence of child temperament on children’s behavior problems (e.g., Arcus et al., 1992; Bates et al., 1998; Coplan et al., 2008; Karreman et al., 2010; Park et al., 1997; Williams et al., 2009), the central objective of the current investigation was to evaluate one such potential mechanism through which all three constructs were associated. More specifically, molecular family stability (as a family environment/parenting variable) was hypothesized
to act as a moderator between child temperament and adjustment, such that the relationship between child temperament and child adjustment would vary depending upon the level of molecular family stability present.

**Molecular Family Stability and Child Adjustment**

Overall, little evidence was found to support the hypothesized relationship between molecular family stability and child adjustment. Although directionally, the correlations suggested that greater levels of molecular family stability were related to lower levels of both parent- and teacher-reported child internalizing and externalizing behavior problems, none of the correlations (with the exception of one) were found to be statistically significant. Thus, the hypothesized relationship between family stability and child adjustment was not clearly supported by the current findings. Other than the directionality of the correlations, there was one other finding suggestive of the hypothesized relationship. In general, the correlations with adjustment utilizing the SAFE Stable Positive scores were stronger than the correlations utilizing the SAFE Total Stability scores, as indicated by the only statistically significant correlation to arise in support of the molecular family stability and child adjustment relationship. This statistically significant negative correlation between the SAFE Stable Positive scores and the CBCL-Externalizing scores suggested that higher levels of regularity of those family activities endorsed as "liked" by the child (from the parent's perspective) were associated with lower levels of parental reports of child externalizing behaviors.

Although the investigative group’s previous studies regarding the relationship between molecular family stability and child adjustment have found significant relationships between the SAFE-P and either the CBCL-Internalizing scale (i.e., Them,
2007), or both the CBCL-Internalizing scale and CBCL-Externalizing scale (i.e., Chalmers, 2005; Roderick, 2002; Sokolowski, 2008), the current study differed from the previous investigations in that it was the first to explore this relationship in a sample of children younger than the second grade. More specifically, the present study sampled only five-year-old kindergartners, whereas the previous studies have involved samples of children ranging in ages anywhere from 7 to 14 and from second grade to eighth grade. This disparity in the age of the children is one possible explanation of the non-significant findings regarding the expected relationship between molecular family stability and child adjustment. As only the contemporaneous associations between variables is assessed, it is possible that the relationship between molecular family stability and child adjustment that has been found for older school-aged children is not yet present or as developed in children as young as five years old. It could be that the weak, but directionally "correct," correlations, as well as the single statistically significant correlation between SAFE stable positive scores and parent report of child externalizing behavior problems found in the present investigation, are early indications of an association in development. In other words, it is possible that the effects of molecular family stability are somewhat cumulative in nature, and therefore the relationship between molecular family stability and child adjustment develops and strengthens over time.

Alternatively, it is possible that the current version of the SAFE may not be a sensitive measure of molecular family stability for children at this stage of development. The regularity of family routines found to be salient in the lives of older school-aged children (e.g., homework routines, individual lessons, or group/club participation) may not yet be family routines established or prominent for children in kindergarten. Perhaps
the regularity of other family activities, such as designated parent-child playtime or parent-directed activities, are more developmentally salient for children of this age group. As this study was the first of its kind to downwardly-extend in age the examination of molecular family stability and child adjustment to a sample of five-year-olds, further evidence and exploration of the relationship between molecular family stability and child adjustment in samples of young children is needed before more definitive conclusions can be made.

Concerns regarding parent- and teacher-reporting of child behavior problems may be another possible explanation for the lack of support for the hypothesized relationship between molecular family stability and child adjustment. This issue, however, will be addressed in further detail in the following sections of this discussion, as this methodological concern appears to be prominent in the potential interpretation of analyses regarding the remaining predicted relationships and hypotheses.

*Child Temperament and Child Adjustment*

The findings regarding the relationships between the child temperament dimensions of inhibition and self regulation with child adjustment were mixed. While the correlations involving child temperament and child externalizing behavior problems were in the expected direction, the correlations involving child temperament and child internalizing behavior problems were not. The correlations of parent- and teacher-reported child internalizing behavior problems with the parent reports of both child surgency/inhibition and child self control/self regulation were in the opposite direction of what was hypothesized. These findings will be discussed in further detail as the results pertaining to each predicted hypothesis is reviewed.
The correlations involving child temperament and child externalizing behavior problems were in the expected direction and statistically significant, supporting the hypothesized relationships between both child effortful control/self regulation and child surgency/inhibition with child externalizing behavior problems. More specifically, the results indicated that higher levels of child effortful control/self regulation were associated with lower levels of both parent- and teacher-reports of child externalizing behavior problems. Additionally, the findings suggested that lower levels of child surgency (higher levels of child inhibition) were associated with lower levels of both parent- and teacher-reports of child externalizing behavior problems. In other words, both parents and teachers reported that children who were more inhibited, as well as those who were more self regulated, displayed fewer externalizing behavior problems in comparison to other children.

While the relationship between child effortful control/self regulation and child externalizing behavior problems is well supported in the child clinical literature (i.e., Eisenberg, Spinrad, & Eggum, 2010), the relationship between child surgency/inhibition and child externalizing behavior problems has not been examined as frequently. The results of the present investigation, however, are consistent with the findings of Sanson, Pedlow, Cann, Prior, and Oberklaid (1996). In one of the few studies that examined the relationships between inhibition and both internalizing and externalizing behavior problems, Sanson and colleagues reported that longitudinal data suggested that at ages 5 and 6, rather than being associated with “negative” characteristics in general (as it had been in infancy), shyness was actually associated with a lack of externalizing problems as reported by teachers. Overall, the hypotheses regarding the relationships between the
child temperament dimensions of inhibition and self regulation with child externalizing behavior problems were supported in the current investigation.

In contrast, the direction of the correlations involving child temperament and child internalizing behavior problems were opposite of the expected direction. For instance, the results of the present investigation suggested that lower levels of child surgency (higher levels of child inhibition) were associated with lower levels of both parent- and teacher-reports of child internalizing behavior problems. Additionally, the results suggested that higher levels of child effortful control/self regulation were associated with lower levels of both parent- and teacher-reports of child internalizing behavior problems. While the correlations between the parent-reported child internalizing behavior problems and the measures of child temperament were of small enough magnitude that they may functionally be considered zero-order magnitude, the correlations regarding teacher-reported child internalizing behavior problems and child temperament were more robust, reaching statistically significant levels.

In the case of the relationship between child effortful control/self regulation and child internalizing behavior problems, it is possible that there is, indeed, an inverse relationship. As most studies have focused solely on externalizing behavior problems in their investigation of the association between child effortful control/self regulation and child adjustment, the prediction of this relationship was the least evidence-based hypothesis of the present study. While it was thought that perhaps children high in effortful control/self regulation may at some point in the control/regulation spectrum become overly controlled and regulated so as to lead to more internalizing behavior problems, it is possible that instead, child effortful control/self regulation may act
protectively against both internalizing and externalizing behavior problems and that there is not a point at which effortful control/self regulation becomes maladaptive to the child during this stage of development.

There is, however, strong evidence that is not consistent with the current findings of an association between lower levels of child surgency (higher levels of child inhibition) and lower levels of internalizing behavior problems. The empirical literature (e.g., see reviews by Bates, 1989; Rothbart, Posner, & Hershey, 1995; Rothbart & Bates, 2006), includes numerous studies reporting that higher levels of child internalizing behavior problems are often associated with lesser child surgency (greater child inhibition). This is in contrast to the findings of the present study. There are a number of possible explanations for these discrepant findings, and these methodological concerns should be considered when interpreting these and other portions of the present results.

For instance, one methodological concern that may be pertinent is the possibility that parent- and teacher-reports of child adjustment (child internalizing behavior problems in particular) lack enough variation to statistically capture the true relationship between child adjustment and the other study variables. As discussed previously, the parents and teachers in the present study reported fewer child adjustment problems in comparison to those of the normative sample. This underreporting of child adjustment problems may have been due to a volunteer bias, such that parents and teachers with more well-adjusted children were more likely to agree to participate in the research study as compared to those parents and teachers of less well-adjusted children. In addition, the standard deviations of the measures of child adjustment were lower than those of the samples used in the development of the adjustment measure, resulting in less variability
and a potential decrease in the likelihood of revealing meaningful relationships. The lack of variance and range of responses, along with the small sample size of the teacher-reported behavior problems should be taken into consideration when interpreting present findings.

Another methodological concern is suggested by the lack of correlation between the parent and teacher responses on their respective Achenbach measures of child internalizing behavior problems. The cross-informant agreement on child internalizing behavior problems for the current sample was, a non-statistically-significant, $r = .03$, and notably lower than the level of agreement ($r = .30, p<.01$) for the sample used in the development of the Achenbach measures (Achenbach & Rescorla, 2000). Comparatively, the parent-teacher agreement on child externalizing behavior problems was, $r = .40, p<.01$ for the current sample, and $r = .58, p<.01$ for the sample used in the development of the Achenbach measures (Achenbach & Rescorla, 2000). While parent-teacher agreement on child externalizing behavior problems was lower than that of the Achenbach sample (Achenbach & Rescorla, 2000), this aspect of parent-teacher agreement was statistically significant in the current study. Thus, the absence of expected levels of parent-teacher agreement are an additional consideration regarding the interpretation of current findings regarding child internalizing behavior problems, in particular, with other study variables.

Lastly, sex differences should also be considered when interpreting the findings of the present study. Statistically significant differences between male and female children were found with regard to parent-reported child effortful control/self regulation and teacher-reported child externalizing behavior problems. More specifically, parents
reported female children as having greater self regulatory abilities as compared to male children and teachers reported higher levels of externalizing behavior problems in male children as compared to female children. Perhaps more importantly, sex differences can also be observed regarding the correlations between the various study variables (see Tables 4 and 5). Not surprisingly, the most striking differences appear in the comparison of the correlations among the measures of child temperament and teacher reports of child adjustment. For instance, while there were strong and statistically significant relationships between both child temperament variables with teacher-reported adjustment (both internalizing and externalizing behavior problems) for female children, none of these relationships were found to be significant for male children. These results suggest that there may be relationships among the variables of child temperament and child adjustment that vary by sex in this developmental period. However, due to the small sample size of the present study, particularly for teacher reports, it was not possible to conduct separate statistical analyses by sex. It is therefore important to consider that sex differences regarding relationships among variables may be contributing to the unexpected results of the present study.

**Moderation Models**

The central objective of the current investigation was to evaluate one potential mechanism through which molecular family stability, child temperament, and child adjustment, might be related. More specifically, molecular family stability was hypothesized to act as a moderator between child temperament and adjustment, such that the relationship between child temperament and child adjustment would vary depending
upon the level of molecular family stability present. The results of the present
investigation do not, however, support the moderation model that was proposed.

None of the full interactional models examining the relationships between either
child temperament dimension and child internalizing behavior problems was found to be
significant. Similarly, the model examining the relationship between child effortful
control/self regulation and parent-reported externalizing behavior problems was not
found to be statistically significant. The full interactional model examining the
relationships between child effortful control/self regulation and teacher-reported child
externalizing behavior, as well as the model examining child surgency/inhibition and
parent-reported child externalizing behavior problems, were statistically significant but
their product terms were not. Only one full interactional model was found to be
statistically significant and had a product term that even approached significance
($p=.062$), this was the model examining the relationship between child
surgency/inhibition and teacher-reported child externalizing behavior problems. Overall,
however, no moderation model was found to have both a statistically significant full
interactional model and a statistically significant product term. Therefore, the results of
the current investigation suggest that there is not an interaction between child
temperament and molecular family stability that significantly impacts child adjustment.
There are several explanations worth considering regarding these unexpected findings.

To begin, many of the basic underlying relationships being considered in the
moderation model were not found to be significant in and of themselves – that is, the
predicted relationships between molecular family stability and child adjustment, as well
as child temperament with child internalizing behavior problems were not found. While
statistical significance of the direct relationships between each of the independent variables with the dependent variable is not a requirement to test a moderation model, the considerations and concerns brought about by the lack of expected findings to the basic and direct relationships underlying the more complex moderation model continue to be present. The finding that the association between molecular family stability and child adjustment may not be present or developed in children of this age group, as compared to older elementary school-aged children, is one possible explanation as to why the moderation model was not found to be significant. If the effects of molecular family stability are somewhat cumulative in nature, and/or the relationship between molecular family stability and child adjustment develops and strengthens over time, the same could be proposed about its relationship with the entire moderation model. It is possible that while molecular family stability may serve as a protective factor for the negative influences of child temperament on child adjustment, it may be an influence that is not notably exhibited until the relationship is examined later in childhood. As this study was the first of its kind to examine molecular family stability in a group of children as young as five years old, further evidence and exploration is necessary before more definite conclusions can be drawn. Longitudinal studies would be the most informative, so as to examine precisely when the association between molecular family stability and child adjustment arises, as well as to re-examine the possible relationship(s) between molecular family stability, child temperament, and child adjustment in later child development. Here also, the issue of whether the current version of the SAFE-P adequately assesses family stability for children in the age group is relevant.
In addition, the discordant findings involving the relationships between child temperament and child adjustment, as well as the methodological concerns that made it difficult to interpret these finding, particularly regarding child internalizing behavior problems and child temperament, are further possible considerations in attempting to understand why the hypothesized moderation model was not supported. For instance, with regard to the adjustment measure/dependent variable, as discussed previously, compared to the normative samples from which the CBCL/1½-5 and the C-TRF were developed, the scores and standard deviations of the present sample were lower and less variable, thus potentially decreasing the likelihood of revealing meaningful relationships. This decreased variability of both parent- and teacher-reports of child adjustment, in addition to the less-than-statistically-desirable sample size of teacher-reports should also be taken into consideration when interpreting these analyses. Also, there appears to be differences in the reporting of internalizing versus externalizing behavior problems, as well as between parent and teacher reporting. This issue of problematic reporting may be associated with the young age of the sample, whereby internalizing symptoms may be less obvious or apparent in young children as compared to externalizing symptoms and therefore externalizing behavior problems may be easier for informants to report on more accurately. Additionally, the difference between parent- and teacher-reporting may be associated with how salient a behavior appears in the environment, such that internalizing symptoms at school might be more easily noticed by a teacher due to the increased social/interactive demands of the environment as compared to what might be observed at home by the parent. Any, and all, of these concerns regarding the reporting of child adjustment make it difficult to discern the actual relationship(s) that may exist between
both molecular family stability and child temperament with child adjustment, as well as the relationship among the three variables together.

Lastly, it is possible that the proposed moderation model, whereby molecular family stability was hypothesized to act as a moderator between child temperament and adjustment, is incorrect and that these child variables do not actually interact as proposed. As this was the first study to investigate molecular family stability and its association with the interaction between child temperament and child adjustment, definite conclusions cannot be drawn. There were, however, a number of differences between the current study and those studies that have found support suggesting that family environment/parenting variables may serve a protective role by attenuating the influence of child temperament on children’s behavior problems (e.g., Arcus et al., 1992; Bates et al., 1998; Coplan et al., 2008; Karreman et al., 2010; Park et al., 1997; Williams et al., 2009) that may have contributed to the lack of predicted findings. For instance, many studies in the field of temperament utilize longitudinal approaches, whereby researchers are able to assess their proposed models over time to determine when and which child variables appear to play a significant role in child development. Additionally, many temperament studies utilize methods which may be more sensitive to capturing temperament displays, such as face-to-face interviews or observation, focused on a single dimension of temperament (e.g., Kagan and colleagues, 1984, 1997, 1999, with their focus on behavioral inhibition, or Eisenberg and colleagues, 1996, 2000, 2004, 2010, with their focus on effortful control). This is in contrast to the more general investigation of more than one temperament dimension via questionnaire, which relies highly on reporter perception. Adjustment measures are also oftentimes more specific in
temperament studies, whereby a researcher interested solely in internalizing symptoms may utilize the Child Depression Inventory (CDI; Kovacs, 1981) or the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds and Richmond, 1978) instead of a more broad assessment of internalizing behavior problems like the Child Behavior Checklist (CBCL; Achenbach, 2001). Due to such considerations, one must interpret the findings of the present investigation with caution. Until further evidence is gathered and/or replication of these results occurs, it is difficult to say with any certainty what actual relationships exist among the variables of molecular family stability, child temperament, and child adjustment during the developmental period of kindergarten transition.

Contributions and Limitations

The present investigation was the first examination of molecular family stability in a sample as young as five years of age. While the direction of the correlations between molecular family stability and child adjustment was the same as previous research findings (Chalmers, 2005; Roderick, 2002; Sokolowski, 2008; Them, 2007), whereby higher levels of molecular family stability were found to be associated with lower levels of child internalizing and externalizing behavior problems, there are questions that result from finding a lack of significant associations. As the research group's previous findings have repeatedly established an association between molecular family stability and adjustment in samples of school-aged children (i.e., ranging from second to eighth grade) as well as in young adult samples, the consideration of possible explanations as to why molecular family stability was not found to be significantly associated with child adjustment in a sample of kindergartners suggests a number of potential new avenues of
exploration. It could be that the present version of the SAFE does not accurately capture molecular family stability as it pertains to children of this age group. Perhaps different family activities or routines are more salient to the family stability of younger children as opposed to those of older school-aged children. It is also possible that the relationship between molecular family stability and child adjustment may not exist this early in childhood and is instead one that develops gradually over time. It could be that molecular family stability is not as salient to children of this age group and that other possible family environment or parenting factors (e.g., parent-child "goodness-of-fit", parental warmth) may have greater influence over child adjustment during this developmental period. Further examination of molecular family stability in early childhood, such as a possible longitudinal study beginning in infancy or early toddlerhood through the early school years, might provide greater understanding as to when, and possibly how, the relationship between molecular family stability and child adjustment develops. The results of such future research could provide an important contribution to development of early-childhood clinical interventions incorporating molecular family stability. Should molecular family stability be found to play a role in child adjustment in early childhood, techniques for helping families to develop regular routines and activities early on in their child's life may be valuable additions to treatment approaches for children. If molecular family stability is a construct whose influence acts cumulatively, or develops over time, it would make sense to start educating parents and including such components into traditional parent training interventions as early in child development as possible.
The present investigation's findings regarding the associations between child temperament and child externalizing behavior problems also contributes to the child temperament literature. The finding that greater levels of child self regulation were related to lower levels of both parent- and teacher-reported child externalizing behavior problems is one that was expected and confirms results already well-established in the temperament literature reviewed earlier. The finding suggesting that greater levels of child inhibition were also related to lower levels of both parent- and teacher-reported child externalizing behavior problems was also hypothesized. This relationship has received less attention in the temperament literature, as most studies examining child inhibition focus solely on measures of child internalizing problems or may include measures of academic and/or social problems. Both current findings provide support of the association between the child temperament dimensions of inhibition and self regulation with child externalizing behavior problems.

In contrast, the associations between child temperament and child internalizing behavior problems were opposite of that which were expected. In the case of the relationship between child effortful control/self regulation and child internalizing behavior problems, it is possible that there is, indeed, an inverse relationship. As few studies have examined internalizing behavior problems in their investigation of the association between child effortful control/self regulation and child adjustment, the prediction of this relationship was the least evidence-based hypothesis of the present study. The results of the present investigation suggest that child effortful control/self regulation may impact both internalizing and externalizing behavior problems during this stage of child development. Further studies would be necessary, however, to confirm this
relationship, particularly given the methodological concerns that have been discussed regarding the reporting of child internalizing behavior problems in the current investigation.

It is these methodological concerns that make it difficult to assess the validity of the findings of the present study suggesting an association between lower levels of child surgency (higher levels of child inhibition) and lower levels of internalizing behavior problems. Again, the empirical literature (e.g., see reviews by Bates, 1989; Rothbart, Posner, & Hershey, 1995; Rothbart & Bates, 2006), includes numerous studies that, in contrast to the findings of the present study, report that higher levels of child internalizing behavior problems are often associated with lesser child surgency (greater child inhibition). Given the numerous methodological concerns already discussed, the current discrepant findings may likely be an artifact of the reporting by the present sample rather than a finding that will be replicable in further studies.

One last, and unique, potential contribution of the present study to the empirical literature is an examination of the relationship between molecular family stability and child temperament. As this was the first study to examine the possible association between these two variables, no hypotheses were proposed at the start of the investigation. Of the four correlations pertaining to these variables (see Table 3) only one was found to be statistically significant when examined for the full sample. That is, the results suggested a positive association between the SAFE-P: Stable Positive Score and the CBQ-VSF: Self Control/Self Regulation Score, such that higher levels of regularity of those family activities endorsed as "liked" by the child (from the parent's perspective) were associated with higher levels of parental reports of child self
control/self regulation. Interestingly, when examined separately by sex, this association was found to be statistically significant (and the correlation even stronger than that of the combined group) for male children but not significant for female children (see Tables 4 and 5). This sex difference was also found in the associations between the SAFE-P: Total Stability and SAFE-P: Stable Positive Scores with the CBQ-VSF: Surgency and CBQ-VSF: Self Control/Self Regulation Scores, whereby the positive correlations all approached significance for male children but did not for female children. These results suggest that there may be differential relationships between molecular family stability and child temperament that vary by sex during this developmental period. However, as this was the first examination of these associations further examination would be warranted before more definitive conclusions can be drawn.

Again, any contributions to the literature should acknowledge limitations of the present investigation. The methodological concerns regarding the reporting of child adjustment are a primary limitation of the current study. The parent- and teacher-reports of child adjustment appeared to lack enough variation in the responses to capture a potential relationship between child adjustment and the other study variables. As previously discussed, the parents and teachers in the present study reported fewer child adjustment problems in comparison to those of the normative sample. This underreporting of child adjustment problems may have been due to a volunteer bias. The standard deviations of the measures of child adjustment also were lower, resulting in less variability and a potential decrease in the likelihood of revealing meaningful relationships. It is possible that the utilization of both a "clinical" and "non-clinical" sample of children and their parents, as well as an increase in sample size, may have
provided the additional variance and range in scores necessary to more accurately assess the relationships between child adjustment and the other study variables.

The size of the sample obtained also significantly limited the power with which the main hypotheses could be evaluated. Due to considerations of sample size, the data for the present investigation were analyzed utilizing correlational and multiple regression strategies. While correlations and multiple regression analyses are satisfactory data analytic strategies, the use of a structural equation modeling (SEM) approach would have been more desirable. SEM is a preferred method for testing complex models, as it is more sensitive to and inclusive in the consideration of the impact of multiple indicators on the variables being examined. However, as SEM requires a sample size much larger than the one obtained in the current investigation, it was not possible to employ this analytic strategy.

Another limitation to consider is that of a lack of generalizability of the findings to dissimilar populations. The present sample was made up of predominantly middle class, Caucasian children and families. These participants were recruited through a public school district, and therefore the sample may have been almost exclusively composed of clinically non-referred children and, indeed, the vast majority were reported as having nonclinical levels of behavior problems. Due to the specific makeup of the current sample, the applicability of the current findings to individuals from different socioeconomic statuses, cultural or ethnic minority backgrounds, and to those with clinically significant problems remains unclear.
References


Inventory: theoretical origins. *Social Science and Medicine, 17*, 193-200.


Table 1. *Means and Standard Deviations of the Stability of Activities in the Family Environment-Parent Version (SAFE-P) and Children’s Behavior Questionnaire-VERY Short Form (CBQ-VSF) for Total Sample and by Child Sex*

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAFE-P: Total Stability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Sample</td>
<td>124</td>
<td>98.47</td>
<td>15.68</td>
</tr>
<tr>
<td>Girls</td>
<td>60</td>
<td>100.20</td>
<td>15.34</td>
</tr>
<tr>
<td>Boys</td>
<td>64</td>
<td>96.84</td>
<td>15.94</td>
</tr>
<tr>
<td>SAFE-P: Stable Positive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Sample</td>
<td>123</td>
<td>96.46</td>
<td>17.16</td>
</tr>
<tr>
<td>Girls</td>
<td>59</td>
<td>97.80</td>
<td>17.67</td>
</tr>
<tr>
<td>Boys</td>
<td>64</td>
<td>95.22</td>
<td>16.71</td>
</tr>
<tr>
<td>CBQ-VSF: Surgency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Sample</td>
<td>125</td>
<td>4.65</td>
<td>0.86</td>
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<tr>
<td>Girls</td>
<td>61</td>
<td>4.55</td>
<td>0.84</td>
</tr>
<tr>
<td>Boys</td>
<td>64</td>
<td>4.74</td>
<td>0.88</td>
</tr>
<tr>
<td>CBQ-VSF: Effortful Control/Self Regulation</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Total Sample</td>
<td>125</td>
<td>5.36</td>
<td>0.72</td>
</tr>
<tr>
<td>Girls</td>
<td>61</td>
<td>5.59</td>
<td>0.68</td>
</tr>
<tr>
<td>Boys</td>
<td>64</td>
<td>5.15</td>
<td>0.69</td>
</tr>
</tbody>
</table>

*Note.* Higher scores on the CBQ-VSF: Surgency scale indicate *decreased* levels of inhibition.
Table 2. *Means and Standard Deviations of the Child Behavior Checklist (CBCL 1½-5) and Caregiver-Teacher Report Form (C-TRF) for Total Sample and by Child Sex*

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CBCL 1½-5: Internalizing Problems</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Sample</td>
<td>125</td>
<td>47.96</td>
<td>10.55</td>
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<tr>
<td>Girls</td>
<td>61</td>
<td>47.90</td>
<td>9.99</td>
</tr>
<tr>
<td>Boys</td>
<td>64</td>
<td>48.02</td>
<td>11.13</td>
</tr>
<tr>
<td><strong>CBCL 1½-5: Externalizing Problems</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Total Sample</td>
<td>125</td>
<td>44.98</td>
<td>10.69</td>
</tr>
<tr>
<td>Girls</td>
<td>61</td>
<td>45.00</td>
<td>10.88</td>
</tr>
<tr>
<td>Boys</td>
<td>64</td>
<td>44.95</td>
<td>10.58</td>
</tr>
<tr>
<td><strong>C-TRF: Internalizing Problems</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Sample</td>
<td>69</td>
<td>43.46</td>
<td>10.09</td>
</tr>
<tr>
<td>Girls</td>
<td>29</td>
<td>41.10</td>
<td>8.60</td>
</tr>
<tr>
<td>Boys</td>
<td>40</td>
<td>45.18</td>
<td>10.83</td>
</tr>
<tr>
<td><strong>C-TRF: Externalizing Problems</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Sample</td>
<td>69</td>
<td>44.74</td>
<td>8.53</td>
</tr>
<tr>
<td>Girls</td>
<td>29</td>
<td>41.86</td>
<td>6.86</td>
</tr>
<tr>
<td>Boys</td>
<td>40</td>
<td>46.83</td>
<td>9.07</td>
</tr>
</tbody>
</table>

*Note.* Child adjustment scores are presented as *T* scores, rather than raw scores. Higher *T* scores correspond to higher levels of child problems.
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. SAFE-P: Total Stability</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2. SAFE-P: Stable Positive</td>
<td>.97***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. CBQ-VSF: Self Control/Self Regulation</td>
<td>.14</td>
<td>.16*</td>
<td>-.18*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. CBCL/1½-5: Internalizing Problems</td>
<td>-.07</td>
<td>-.08</td>
<td>.07</td>
<td>-.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. CBCL/1½-5: Externalizing Problems</td>
<td>-.13</td>
<td>-.16*</td>
<td>.33***</td>
<td>-.16*</td>
<td>.68***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. C-TRF: Internalizing Problems</td>
<td>-.13</td>
<td>-.15</td>
<td>.20*</td>
<td>-.30*</td>
<td>.03</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td>8. C-TRF: Externalizing Problems</td>
<td>-.06</td>
<td>-.11</td>
<td>.33**</td>
<td>-.31**</td>
<td>.17</td>
<td>.40***</td>
<td>.73***</td>
</tr>
</tbody>
</table>

* * * \( p < .001 \)

** * * \( p < .01 \)

* \( p < .05 \)

Note. Statistical significance based upon one-tailed \( p \) values. Higher scores on the CBQ-VSF: Surgency scale indicate decreased levels of inhibition.
Table 4. Correlations between Stability of Activities in the Family Environment-Parent Version (SAFE-P), Children’s Behavior Questionnaire-Very Short Form (CBQ-VSF), Child Behavior Checklist (CBCL 1½-5) and Caregiver-Teacher Report Form (C-TRF) for Boys Only Sample

<table>
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<tr>
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<th>6</th>
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<tr>
<td>2. SAFE-P: Stable Positive</td>
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</tr>
<tr>
<td>3. CBQ-VSF: Surgency</td>
<td>.19^</td>
<td>.19^</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. CBQ-VSF: Self Control/Self Regulation</td>
<td>.20^</td>
<td>.23*</td>
<td>-.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5. CBCL/1½-5: Internalizing Problems</td>
<td>-.01</td>
<td>-.03</td>
<td>.05</td>
<td>.02</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6. CBCL/1½-5: Externalizing Problems</td>
<td>-.09</td>
<td>-.11</td>
<td>.32**</td>
<td>-.01</td>
<td>.71***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. C-TRF: Internalizing Problems</td>
<td>-.13</td>
<td>-.17</td>
<td>.01</td>
<td>-.15</td>
<td>.01</td>
<td>.10</td>
<td></td>
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<tr>
<td>8. C-TRF: Externalizing Problems</td>
<td>-.05</td>
<td>-.09</td>
<td>.18</td>
<td>-.10</td>
<td>.10</td>
<td>.30*</td>
<td>.77***</td>
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</table>

^ p<.10  * p<.05  **p<.01  ***p<.001

Note. Statistical significance based upon one-tailed p values. Higher scores on the CBQ-VSF: Surgency scale indicate decreased levels of inhibition.
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
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<td>1. SAFE-P: Total Stability</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2. SAFE-P: Stable Positive</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td>3. CBQ-VSF: Surgency</td>
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<td>.10</td>
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<td>4. CBQ-VSF: Self Control/Self Regulation</td>
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<td>.06</td>
<td>-.18^</td>
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<td>5. CBCL/1½-5: Internalizing Problems</td>
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<td>-.14</td>
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<tr>
<td>6. CBCL/1½-5: Externalizing Problems</td>
<td>-.17</td>
<td>-.21^</td>
<td>.35**</td>
<td>-.33**</td>
<td>.66***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. C-TRF: Internalizing Problems</td>
<td>-.11</td>
<td>-.10</td>
<td>.36*</td>
<td>-.44**</td>
<td>.06</td>
<td>.14</td>
<td></td>
</tr>
<tr>
<td>8. C-TRF: Externalizing Problems</td>
<td>-.01</td>
<td>-.16</td>
<td>.51**</td>
<td>-.63***</td>
<td>.42*</td>
<td>.62***</td>
<td>.55**</td>
</tr>
</tbody>
</table>

^ p<.10 * p<.05 **p<.01 ***p<.001

Note. Statistical significance based upon one-tailed p values. Higher scores on the CBQ-VSF: Surgency scale indicate decreased levels of inhibition.
Table 6. **Summary of Regression Analyses Examining the Influence of Child Inhibition on Parent-Reported Child Internalizing Behavior Problems as a Function of Molecular Family Stability**

<table>
<thead>
<tr>
<th>Dependent Variable Predictors</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>( R^2 ) inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Income (covariate)</td>
<td>-0.31</td>
<td>0.42</td>
<td>-0.07</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability</td>
<td>-0.02</td>
<td>0.04</td>
<td>-0.04</td>
<td></td>
</tr>
<tr>
<td>CBQ-VSF: Surgency</td>
<td>0.42</td>
<td>0.68</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability x CBQ-VSF: Surgency</td>
<td>0.08</td>
<td>0.05</td>
<td>0.17</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Total \( R^2 \) \hspace{1cm} 0.04

*Note.* \( N = 122. \) The product term was entered in a hierarchical manner. CBCL raw scores were used. \( B \) (unstandardized beta-weights) and \( \beta \) (standardized beta-weights) are from the full model including the interaction term. \( R^2 inc. \) = increment in the overall \( R^2 \) due to the product term. No statistical significance was found.
Table 7. Summary of Regression Analyses Examining the Influence of Child Inhibition on Teacher-Reported Child Internalizing Behavior Problems as a Function of Molecular Family Stability

<table>
<thead>
<tr>
<th>Dependent Variable Predictors</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>$R^2$ inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Income (covariate)</td>
<td>0.40</td>
<td>0.48</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability</td>
<td>-0.04</td>
<td>0.05</td>
<td>-0.11</td>
<td></td>
</tr>
<tr>
<td>CBQ-VSF: Surgency</td>
<td>1.50</td>
<td>0.77</td>
<td>0.24</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability x CBQ-VSF: Surgency</td>
<td>0.07</td>
<td>0.06</td>
<td>0.14</td>
<td>0.02</td>
</tr>
<tr>
<td>Total $R^2$</td>
<td></td>
<td></td>
<td></td>
<td>0.10</td>
</tr>
</tbody>
</table>

Note. $N = 66$. The product term was entered in a hierarchical manner. CBCL raw scores were used. $B$ (unstandardized beta-weights) and $\beta$ (standardized beta-weights) are from the full model including the interaction term. $R^2$ inc. = increment in the overall $R^2$ due to the product term. No statistical significance was found.
Table 8. *Summary of Regression Analyses Examining the Influence of Child Self Regulation on Parent-Reported Child Externalizing Behavior Problems as a Function of Molecular Family Stability*

<table>
<thead>
<tr>
<th>Dependent Variable Predictors</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>$R^2$ inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Income (covariate)</td>
<td>-1.00</td>
<td>0.51</td>
<td>-0.18</td>
<td></td>
</tr>
<tr>
<td>Child Sex (covariate)</td>
<td>1.15</td>
<td>1.49</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability</td>
<td>-0.01</td>
<td>0.05</td>
<td>-0.02</td>
<td></td>
</tr>
<tr>
<td>CBQ-VSF: Self Control/Self Regulation</td>
<td>-2.06</td>
<td>1.04</td>
<td>-0.19</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability x CBQ-VSF: Self Control/Self Regulation</td>
<td>-0.07</td>
<td>0.07</td>
<td>-0.09</td>
<td>0.01</td>
</tr>
<tr>
<td>Total $R^2$</td>
<td></td>
<td></td>
<td></td>
<td>0.08</td>
</tr>
</tbody>
</table>

*Note. N = 122. The product term was entered in a hierarchical manner. CBCL raw scores were used. $B$ (unstandardized beta-weights) and $\beta$ (standardized beta-weights) are from the full model including the interaction term. $R^2$ inc. = increment in the overall $R^2$ due to the product term. No statistical significance was found.*
Table 9. Summary of Regression Analyses Examining the Influence of Child Self Regulation on Teacher-Reported Child Externalizing Behavior Problems as a Function of Molecular Family Stability

<table>
<thead>
<tr>
<th>Dependent Variable Predictors</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>$R^2$ inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Income (covariate)</td>
<td>-0.75</td>
<td>0.67</td>
<td>-0.13</td>
<td></td>
</tr>
<tr>
<td>Child Sex (covariate)</td>
<td>-3.87</td>
<td>1.93</td>
<td>-0.25</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability</td>
<td>0.05</td>
<td>0.07</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>CBQ-VSF: Self Control/Self Regulation</td>
<td>-2.44</td>
<td>1.29</td>
<td>-0.24</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability x CBQ-VSF: Self Control/Self Regulation</td>
<td>-0.07</td>
<td>0.10</td>
<td>-0.10</td>
<td>0.01</td>
</tr>
<tr>
<td>Total $R^2$</td>
<td></td>
<td></td>
<td></td>
<td>0.17*</td>
</tr>
</tbody>
</table>

Note. $N = 66$. The product term was entered in a hierarchical manner. CBCL raw scores were used. $B$ (unstandardized beta-weights) and $\beta$ (standardized beta-weights) are from the full model including the interaction term. $R^2$ inc. = increment in the overall $R^2$ due to the product term. * $p<.05$. 
<table>
<thead>
<tr>
<th>Dependent Variable Predictors</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>R^2 inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Income (covariate)</td>
<td>-0.53</td>
<td>0.49</td>
<td>-0.10</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability</td>
<td>-0.07</td>
<td>0.05</td>
<td>-0.13</td>
<td></td>
</tr>
<tr>
<td>CBQ-VSF: Surgency</td>
<td>3.16</td>
<td>0.79</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability x CBQ-VSF: Surgency</td>
<td>0.03</td>
<td>0.05</td>
<td>0.04</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Total R^2                                           | 0.16***|

**Note.** N = 122. The product term was entered in a hierarchical manner. CBCL raw scores were used. B (unstandardized beta-weights) and β (standardized beta-weights) are from the full model including the interaction term. R^2 inc. = increment in the overall R^2 due to the product term. ***p<.001.
Table 11. Summary of Regression Analyses Examining the Influence of Child Inhibition on Teacher-Reported Child Externalizing Behavior Problems as a Function of Molecular Family Stability

<table>
<thead>
<tr>
<th>Dependent Variable Predictors</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>$R^2$ inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Income (covariate)</td>
<td>-0.32</td>
<td>0.65</td>
<td>-0.06</td>
<td></td>
</tr>
<tr>
<td>Child Sex (covariate)</td>
<td>-3.73</td>
<td>1.88</td>
<td>-0.24</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability</td>
<td>-0.02</td>
<td>0.06</td>
<td>-0.05</td>
<td></td>
</tr>
<tr>
<td>CBQ-VSF: Surgency</td>
<td>2.04</td>
<td>1.09</td>
<td>0.23</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability x CBQ-VSF: Surgency</td>
<td>0.17</td>
<td>0.08</td>
<td>0.24</td>
<td>0.05</td>
</tr>
<tr>
<td>Total $R^2$</td>
<td></td>
<td></td>
<td></td>
<td>0.23**</td>
</tr>
</tbody>
</table>

*Note. N = 66. The product term was entered in a hierarchical manner. CBCL raw scores were used. B (unstandardized beta-weights) and β (standardized beta-weights) are from the full model including the interaction term. $R^2$ inc. = increment in the overall $R^2$ due to the product term. ** $p<.01.$*
Table 12. *Summary of Regression Analyses Examining the Influence of Child Self Regulation on Parent-Reported Child Internalizing Behavior Problems as a Function of Molecular Family Stability*

<table>
<thead>
<tr>
<th>Dependent Variable Predictors</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>$R^2$ inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Income (covariate)</td>
<td>-0.45</td>
<td>0.43</td>
<td>-0.10</td>
<td></td>
</tr>
<tr>
<td>Child Sex (covariate)</td>
<td>-0.31</td>
<td>1.24</td>
<td>-0.02</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability</td>
<td>0.01</td>
<td>0.04</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>CBQ-VSF: Self Control/Self Regulation</td>
<td>-0.21</td>
<td>0.86</td>
<td>-0.02</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability x CBQ-VSF: Self Control/Self Regulation</td>
<td>-0.08</td>
<td>0.06</td>
<td>-0.13</td>
<td>0.01</td>
</tr>
<tr>
<td>Total $R^2$</td>
<td></td>
<td></td>
<td></td>
<td>0.03</td>
</tr>
</tbody>
</table>

*Note. $N = 122$. The product term was entered in a hierarchical manner. CBCL raw scores were used. $B$ (unstandardized beta-weights) and $\beta$ (standardized beta-weights) are from the full model including the interaction term. $R^2$ inc. = increment in the overall $R^2$ due to the product term. No statistical significance was found.*
Table 13. *Summary of Regression Analyses Examining the Influence of Child Self Regulation on Teacher-Reported Child Internalizing Behavior Problems as a Function of Molecular Family Stability*

<table>
<thead>
<tr>
<th>Dependent Variable Predictors</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>$R^2$ inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Income (covariate)</td>
<td>0.17</td>
<td>0.49</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Child Sex (covariate)</td>
<td>-1.25</td>
<td>1.40</td>
<td>-0.11</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability</td>
<td>0.00</td>
<td>0.05</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>CBQ-VSF: Self Control/Self Regulation</td>
<td>-1.74</td>
<td>0.94</td>
<td>-0.25</td>
<td></td>
</tr>
<tr>
<td>SAFE-P: Total Stability x CBQ-VSF: Self Control/Self Regulation</td>
<td>-0.02</td>
<td>0.07</td>
<td>-0.04</td>
<td>0.00</td>
</tr>
<tr>
<td>Total $R^2$</td>
<td></td>
<td></td>
<td></td>
<td>0.10</td>
</tr>
</tbody>
</table>

*Note.* $N = 66$. The product term was entered in a hierarchical manner. CBCL raw scores were used. $B$ (unstandardized beta-weights) and $\beta$ (standardized beta-weights) are from the full model including the interaction term. $R^2$ inc. = increment in the overall $R^2$ due to the product term. No statistical significance was found.
Figure 1. Model depicting molecular family stability as a moderator of the relationship between temperament and psychosocial adjustment in children.
Figure 2. Model depicting molecular family stability as a moderator of the relationship between child inhibition and child internalizing behavior problems.
Figure 3. Model depicting molecular family stability as a moderator of the relationship between child self regulation and child externalizing behavior problems.