

**Interactions of Parent and Adolescent Temperament Dimensions in Relation
to the Emotion Regulatory System**

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Abstract

Extant research on temperament shows that it may be related to certain developmental outcomes. However, according to the goodness-of-fit hypothesis (Chess & Thomas, 1999), developmental outcomes are the result of how well the biological tendencies of an individual (i.e. temperament) fit with the contextual demands of their environment. Thus, temperament should only affect developmental outcomes as a function of their environmental context. The current study proposes that parent temperament may serve as an environmental context that interacts with adolescent temperament to affect the development of the adolescent emotion regulatory system. Structural equation modeling results revealed parent temperament, specifically parent effortful control, to moderate the relationship between adolescent temperament and the adolescent emotion regulatory system. Several gender differences were also found for both main and interaction effects. Adolescent negative affect was negatively related to emotion regulation for girls only. Parent effortful control moderated the relationship between adolescent effortful control and suppression use also for girls only. Parent effortful control moderated the relationship between adolescent surgency and emotion lability for boys only, and parent effortful control moderated the relationship between adolescent surgency and suppression for both boys and girls, but in opposite directions. The interaction term was negatively related to suppression for girls, and it was positively related to suppression for boys. Results have several implications for potential parenting interventions and may inform programs that teach emotion regulation strategies.

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Chapter 1 – Introduction

Temperament refers to individual differences in emotionality and behavior that are biologically based and influential on an individual's interaction with their environment (Rothbart, Ahadi, & Evans, 2000). Early psychological research on temperament focused mainly on temperament in infancy and early childhood and demonstrated that temperament does indeed have a major impact on numerous outcomes, including child adjustment, regulation, social skills, parenting behaviors, and parent-child relationships (e.g., Scholom, Zucker, & Stollak, 1979). More recent research on temperament has demonstrated that the importance of temperament in relation to positive outcomes is not limited to early development but also has significant effects on developmental and behavioral outcomes in later childhood and adolescence. Temperament in late childhood and adolescence, in particular, has been linked to externalizing behaviors such as delinquency, aggression (Schwartz, Snidman, & Kagan, 1999; van der Voort et al., 2013), and substance use (Cheetham et al., 2015; Tubman & Windle, 1995; Wills & Dishion, 2004) as well as internalizing behaviors such as depression (Tubman & Windle, 1994; Bould et al., 2014), mania, manic-depression, and suicide attempts (Cloninger, Bayon, & Svrakic, 1998; Pompili et al., 2014).

Thomas and Chess (1977) posit that the impact of temperament on any outcome, whether adaptive or maladaptive, is a result of the interaction of the individual's temperament with their specific environment. They use the term 'goodness-of-fit' in an effort to explain why individuals with similar temperamental profiles may experience drastically different outcomes. Adaptive outcomes may be indicative of a good fit with the individual's temperament and environment, whereas maladaptive outcomes may be indicative of a poor fit. Thus, the environmental context is considered crucial when examining the effects of temperament on outcomes. One important contributor to environmental context for adolescents is parent temperament (Yap, Allen, & Sheeber, 2007). Parent temperament, like adolescent temperament, has been directly linked to adolescent internalizing and externalizing behaviors (Rettew et al., 2006).

Although much research on temperament has focused on psychopathology and behavioral outcomes in adolescence, few studies have examined the impact of temperament on the development of regulatory systems that are closely related to psychopathology. The emotional regulatory system, in particular, is highly related to both externalizing and internalizing

symptomatology (e.g., Garnefski, Kraaij, & Etten, 2005; Mullin & Hinshaw, 2007; Suveg & Zeman, 2004). In an effort to address this gap in the literature, the current study seeks to explore interaction effects between biologically based individual differences in adolescent temperament and parent temperament on the adolescent emotional regulatory system.

In setting the stage for the premise of the current study, I first explore influential changes experienced by adolescents as they relate to the importance of understanding emotional regulatory processes. Second, I explore origins of the study of temperament leading up to the current conceptualizations of temperament and the approach that I use as a basis for this study. Third, I explore the concept of ‘goodness-of-fit’ in understanding the relationship of temperament and the environmental context which influences developmental outcomes. Fourth, I describe the emotional regulatory system and its importance for adaptive developmental outcomes and distinguish it from emotional aspects of temperament. I also review research relating temperament to the emotional regulatory system. Finally, I provide an overview of the purpose of the current study and describe its unique contribution to research on temperament and emotion regulation.

1.1 - Adolescence

Adolescence is perhaps best described as a period of transitions. In addition to physiological changes and the onset of puberty, adolescents experience significant changes in social and affective experiences. In this section, I will briefly outline research on the social and affective changes in adolescence as it highlights the importance of understanding regulatory processes, specifically emotional regulatory processes, in adolescence.

Though the age range determining the time of adolescence is subject to debate, adolescence can be considered the time occurring roughly between 12 and 18 years of age. Some researchers have extended this range to as old as 25 years of age, but in recent research the early 20s are more commonly referred to as ‘emerging adulthood’ (Spear, 2000). During this time period (give or take a few years), adolescents experience drastic changes in their social network. Adolescents begin to spend less time with their immediate family and more time with peers and engaging in extracurricular activities outside the home. In fact, they spend much more time with peers than with their parents or even adults in general, and they gradually become less dependent on their parents as the main source of social-emotional support and more dependent on peers

(Spear, 2000). These changes in the social network are accompanied by changes in social processing in the brain (Nelson et al., 2005), and adolescents begin to demonstrate maturation in social emotion processing (Burnett et al., 2009).

The increasing importance of peer relationships during adolescence has great potential to contribute positively to social and emotional development; however, the emphasis on peer relationships also comes with a host of novel stressors. Although developing peer relationships can be a facilitator of learning social skills, some adolescents experience peer rejection and even victimization. Given the value placed on peer relationships during this period of time, dealing with rejection and victimization can become a major source of stress for adolescents (Masten et al., 2009). In tandem with pubertal development that occurs during this time period, adolescents begin to experiment with romantic relationships and dating, which adds yet another dimension that has the potential for positive development while also increasing stress (La Greca & Harrison, 2005). An environmental change experienced by most adolescents is changes in schools. Not only does the structure of school change but adolescents face new academic challenges. Changes in school often lead to sleep deprivation, as the physical changes experienced in adolescence alter sleep patterns and require more sleep, but high school often requires students to arrive at school earlier than they have previously been accustomed (Wolfson & Carskadon, 1998).

Adolescents also experience changes in mood and emotion experiences that are likely related to life changes and transitions. Adolescents display more extremes in mood than adults and younger children (Arnett, 1999). They also tend to be more volatile and experience heightened anxiety and self-consciousness (Buchanan, Eccles, & Becker, 1992). Especially for adolescent girls, depression is also a common experience. Dorn and Chrousos (1993) state that adolescence is a “constant state of threatened homeostasis” (p. 685) and stress that adaptive responses are crucial to continued healthy development. Adolescents are at risk for dependence on maladaptive coping strategies such as drug use. Exploratory drug use is often considered normative during adolescence, and for many, experimentation with drugs is mild and often decreases with age. However, some adolescents become dependent on narcotics early on beginning a struggle with addiction (Spear, 2000). One factor that is predictive of which path the adolescent experimenting with drugs will take is whether or not the adolescent uses drugs as a way to cope with stress (Spear, 2000). Extant research shows that good emotion regulation

ability and positive coping skills may be important in the prevention of self-medication via drug use (Kashdan et al., 2010). Given both the prevalence of drug experimentation as well as the increase in stressful life changes during adolescence, it is especially important to understand mechanisms that contribute to healthy stress coping such as emotion regulation ability.

1.2 - Origins of the Modern Study of Temperament

Long before psychology emerged as a field of science, philosophers speculated on the origins of individual differences in emotionality and behavior. Some of the most basic claims of earliest theories on temperament have persisted to modern theories, and many have been supported by empirical evidence. This section will highlight a selection of early theories of temperament in order to trace the development of the concept and to facilitate an understanding of the origins of the theoretical premises upon which the current study will be conducted.

Perhaps the earliest recorded theory of temperament (though the term was not employed at the time) is from the 4th century B.C. and was founded by Hippocrates. Building on the concept of the four elements (fire, air, water, and earth), Hippocrates identified four qualities (warmth, cold, moisture, and dryness). These four qualities were thought to be expressed through bodily humors or fluids assumed to be innate to the individual organism. Good health was thought to follow from a balance or proper mix of these fluids, whereas illness was thought to be caused by imbalance. Following the work of Hippocrates, Galen, a Greek physician from 2nd century A.D., first introduced what would become the modern term of ‘temperament’ from the Latin *temperare* “to mix” and from *temperamentum* “proper mixture.” According to Galen’s typology, there are nine temperaments. The first four temperaments are related to dominance of one of Hippocrates’ qualities (i.e. warmth, cold, moisture, or dryness) and were named choleric, melancholic, sanguine, and phlegmatic (Strelau, 1998). Galen ascribed emotional and behavioral tendencies to each of the primary temperaments. Choleric was associated with anger, irritability and aggression, melancholic with fear and sadness, sanguine with positive affect and sociability, and phlegmatic with slowness of emotion and action (Rothbart, Ellis, & Posner, 2004). The next four of Galen’s temperaments were considered secondary and relate to pairs or mixtures of dominant qualities. The final temperament consisted of a perfect balance of all the qualities and was therefore considered to be the ideal temperament. These temperament types were thought to be biologically based, specifically through activity in the endocrine system (Strelau, 1998).

Building off of Galen's typology, in 1798 Immanuel Kant theorized that temperament was indeed biologically based through the composition of blood. Kant categorized Galen's four typologies by tendency to energy versus drowsiness and a tendency to emotions versus action. Sanguine and melancholic types were identified by domination of emotions over action, but with sanguine being high energy and melancholic being low energy. Choleric was characterized by high energy and phlegmatic by lower energy, and both were identified by a dominance of action over emotionality. Kant's theory provided a foundation for the role of emotions versus actions or behavioral tendencies in the definition of temperament. Many subsequent theories argued that temperament should only relate to emotionality and not behavior. Wilhelm Wundt was among the first to take this stance. Wundt (1887) conceptualized temperament as individual differences in drives and emotions. Still using Galen's original terms, Wundt introduced a two-dimensional typology that allowed for blends of the four basic temperament types. On one axis is strength of emotion from "strong" to "weak." Choleric and melancholic fall in the realm of strong emotion and sanguine and phlegmatic into that of weak emotion. Wundt also introduced the idea of rapidity of changes in emotionality. Thus, on the other axis, temperament is graded by rapidity in emotional changes with choleric and sanguine being quick to changes in emotions and melancholic and phlegmatic being slow to changes. The concept of changes in emotionality is related to the modern term of emotion lability, which refers to reactivity to emotional stimuli and tendency to mood swings (Dunsmore, Booker, & Ollendick, 2011). Though almost all modern conceptualizations of temperament include dimensions of emotionality, they often do not include emotion lability as a specific temperament trait. Other followers of the emotion-oriented model of temperament include Allport (1937), Eysenck (1970), and Goldsmith and Campos (1990). Like Wundt, these scientists argue that definitions of temperament should be limited to individual differences in emotionality (Strelau, 1998).

Though many more theories regarding temperament exist than have been presented here, this summary provides a brief sketch of the most relevant theories of temperament that have influenced the development of the study of temperament. We now arrive at the two theories that form the basis for the current study, the first being Thomas and Chess's (1977) interactional theory of temperament. This theory expands the concept of temperament beyond emotionality and applies it directly to behavior. Specifically, temperament is thought to be concerned with the way a person behaves both emotionally and physically (Thomas & Chess, 1977). A unique point

of this theory is the emphasis that temperament is an independent psychological attribute that is expressed solely as a response to external stimuli. Temperament, then, is viewed as a biologically based attribute that modifies the influence of the environment but has no specific value for explaining individual differences outside the context of the environment; it is the interaction of temperament and the environment that explains individual differences. Thomas and Chess (1977) also introduce the idea of goodness-of-fit between temperament and environment as essential for adaptive developmental outcomes. As the goodness-of-fit model comprises much of the basis for the main hypothesis of the current study, I will return to this concept for a more detailed explanation on page eleven.

The second theory that is especially relevant to the current study is the developmental perspective of Rothbart and Derryberry (1981). This perspective of temperament does not restrict the understanding of temperament to exclusively emotional domains but includes activity level, orienting, and executive attention (Rothbart et al., 2004). Rothbart and Derryberry (1981) define temperament as “constitutionally based individual differences in reactivity and self-regulation, as seen in emotional, motor, and attentional domains” (p. 37). Three words in this definition are key to the essence of Rothbart and Derryberry’s theory: constitutional, reactivity, and self-regulation. The term ‘constitutional’ refers to the biological basis for temperament. The biological basis for temperament is one that has endured through centuries of speculation and research on the nature of temperament. Current research supports this idea, but emphasizes that this does not mean that temperament is inflexible or static; the biological basis for temperament is influenced over time by environment and experience (Putnam, Ellis, & Rothbart, 2001). The term ‘reactivity’ refers to arousal of physiological and behavioral systems, specifically, their onset, intensity and duration (Rothbart et al., 2004). These may include somatic, autonomic, neuroendocrine, and cognitive systems (Rothbart, 1991). Finally, ‘self-regulation’ refers to processes that modulate reactivity (Rothbart et al., 2004). For the current study, I will define temperament using this perspective.

Research in temperament has utilized a great number of temperament dimensions that have varied in labels and definition. Temperament, as measured by Rothbart and Derryberry’s (1981) perspective, can most simply be reduced to three dimensions: surgency, negative affect, and effortful control. These dimensions encompass components of reactivity and regulation in emotional, motor, and attentional domains. Surgency is characterized by seeking high intensity

pleasure (motor activity and stimulation seeking), low levels of shyness, and low levels of fear (Putnam et al., 2001). Surgency is highly correlated with Gray's (1991) Behavioral Activation Scale (BAS; Muris & Meesters, 2009) and is reflective of extraversion factors in adult personality measures (Putnam et al., 2001). Negative affect is comprised of levels of frustration, aggression, and depression. It is important to note that high negative affect does not necessarily mean a deficit in positive affect. Individuals high in negative affect may experience both high levels of positive and negative affect (Capaldi & Rothbart, 1992). Finally, effortful control focuses mainly on attentional systems, specifically, directing attention and inhibiting initial urges and reactions. Of the three temperament dimensions, effortful control shows the most development throughout the lifespan, with the greatest maturation evidenced first during the second year of life and then during adolescence (Posner & Rothbart, 2000). All three dimensions are considered to be constitutional (that is, biologically based). Surgency and negative affect are components of reactivity, or arousal of physiological and behavioral systems, whereas effortful control maps onto the self-regulation component of Rothbart and Derryberry's (1981) definition.

1.3 - Goodness-of-fit

The premise of the goodness-of-fit model is based on the idea that neither endogenous (innate tendencies or "nature") nor exogenous (environment or "nurture") factors have primacy as causal factors for developmental outcomes. Chess and Thomas (1999) posit that developmental outcomes, whether adaptive or maladaptive, are the product of the interaction between the innate self (that is biologically based tendencies and genetics) and demands of the environmental context. Goodness-of-fit, then, refers to how well the innate and biological capacities of the organism complement the expectations and demands of the surrounding environment (Chess & Thomas, 1999). According to Thomas and Chess (1977), these innate and biological capacities may be captured in the construct of individual temperament. The goodness-of-fit model hypothesizes that developmental outcomes depend greatly on how well an individual's temperament fits with the demands of their social context.

Unlike many historical concepts on the nature of temperament and its relation to behavioral outcomes, the goodness-of-fit model emphasizes that there is no "ideal" temperament. Lerner and Lerner (1983) point out that much research on temperament focuses on long-term effects of specific temperament traits on psychosocial functioning. In this tradition, some temperamental traits are thought to be more predictive of maladaptive outcomes, whereas others

are more predictive of adaptive outcomes. However, according to Chess and Thomas (1999), “the pathology is in the interaction” (p. 9), not in the person’s temperament. Adaptive outcomes do not necessarily spring from having an “easy” temperament, nor do maladaptive outcomes occur due to possession of a “difficult” temperament (Thomas & Chess, 1977). The goodness-of-fit model “stresses that temperament only has meaning for the person as a consequence of the impact it has on the physical and social context” (Lerner & Lerner, 1983). A good fit of temperament and contextual demands, then, is predictive of positive developmental outcomes, and a poor fit is predictive of increased vulnerability and risk for poor developmental outcomes (Galambos & Turner, 1999). From this perspective, no one aspect of temperament is more desirable or healthy than another. Additionally, this framework emphasizes the active role of the individual in their own development. Interactions of the individual’s temperament and environmental context provoke differential reactions from which the individual receives feedback (Lerner & Lerner, 1983). In this way, two individuals with similar temperaments may experience vastly different developmental trajectories, depending on the environmental and social context (Thomas & Chess, 1977).

At this point it is important to stress that a good fit between the individual’s temperament and the environmental context does not necessarily mean that the individual will never experience stress or conflict. Indeed, research shows that experiencing a moderate amount of adversity is actually beneficial for development (Seery, Holman, & Silver, 2010). A good fit, then, is not one in which the individual never experiences challenges or distress but one which facilitates mastery of organizing individual functioning to fit the demands of the environment. Chess and Thomas (1999) give the example of a slow-to-warm-up child facing a new social situation. A poor fit in this situation would be one that does not permit the child the resources necessary for adjustment. In this situation, resources may constitute a variety of factors, including parental or peer support. Thus, if the demand is overly dissonant with the child’s capacities, mastery may not be achieved. According to the goodness-of-fit model, it is extensive and prolonged distress due to such dissonant situations that contributes to maladaptive outcomes. In contrast, if the demands of the situation are such that allow for progressive adjustment, this good fit will allow the challenge to prove beneficial for the child’s development (Chess & Thomas, 1999, p. 114). Bates, Petit, Dodge, and Ridge (1998) demonstrated this concept empirically by looking at the interaction of temperamental resistance to control and parental

restrictiveness predicting later externalizing problems. It was found that early resistance to control (at five years of age) predicted later externalizing problems (at seven to eleven years of age) only when the parent was low on restrictiveness.

The contextual demands of any given situation vary greatly, and some demands may be more relevant at the moment than others. According to Lerner and Lerner (1983), contextual demands take three basic forms. First, demands may consist of “attitudes, values, or stereotypes held by others in the context regarding the person’s attributes (either his/her physical or behavioral characteristics)” (p. 207). Second, the behavioral or temperamental attributes of other individuals may create demands that require the individual to adjust their own attributes in order to have a positive interaction. Third, the physical characteristics of a setting may require the individual to possess certain attributes. The current study deals mostly with the second form: behavioral and temperamental attributes of others.

A majority of research on adolescent temperament examines it in relation to parenting behaviors (see Putnam, Sanson, & Rothbart, 2005 for a review). Although parenting behaviors are especially relevant to the child, the child’s experience of the parent is much broader than their specific parenting behaviors. Yap and colleagues (2007) propose that family processes consisting of parent emotion regulation abilities, parent’s socialization of emotion, and parent temperament are likely to interact with adolescent temperament in influencing outcomes such as emotion regulation and adolescent depression. Indeed, parenting behaviors, while influenced by child temperament, may also be heavily influenced by parent temperament (Chess & Thomas, 1999; Rettew et al., 2006). Radke-Yarrow and Sherman (1990) note that the caregiving environment is often shaped by how well the child meets the needs of the parent. A child that meets their parents’ needs is more likely to receive social and emotional resources from the parent and will also likely experience more positive parenting behaviors as a result. The current study proposes that parental attributes, specifically parent temperament, may be considered an important component of an adolescent’s environmental and social context, in that temperamental attributes of the parent will create contextual demands on the adolescent which will influence developmental outcomes.

Empirical research on the interaction of adolescent and parent temperament on adolescent outcomes has produced mixed results. Kawaguchi and colleagues (1998) examined the relationship between adolescent temperament and parent-adolescent relationship in the context of

parent temperament. The authors measured temperament using the Dimensions of Temperament Survey-Revised (DOTS-R; Windle & Lerner, 1986) which assesses ten different temperament dimensions. The dimensions are: general activity level, sleep activity level, approach/withdrawal, flexibility/rigidity, positive mood, sleep rhythmicity, eating rhythmicity, daily habits rhythmicity, distractibility, and persistence. The authors found that mother's and father's temperaments had significant direct effects on the parent-adolescent relationship. Indeed, parent temperament appeared to have more influence on the parent-adolescent relationship than adolescent temperament. However, parent temperament did not appear to function as a contextual demand in interaction with adolescent temperament. In contrast, Galambos and Turner (1999) found that interactions of adolescent and parent temperament did predict variations in the parent-adolescent relationship over and above the individual contributions of adolescent and parent temperament. The authors also measured temperament using the Dimensions of Temperament Survey-Revised (DOTS-R; Windle & Lerner, 1986). Although the DOTS-R was initially intended to measure ten separate dimensions of temperament, the authors chose to examine two specific dimensions: adaptability (flexibility and ease in dealing with new people and situations) and activity (amount of energy and motor movement). In particular, the authors found that interactions of low mother adaptability and less active sons was related to high levels of relational conflict, whereas low mother adaptability and more active daughters was related to high levels of relational conflict.

Similarly, Rettew and colleagues (2006) demonstrated the effects of parent-child temperament interaction in relation to child psychopathology. Results showed that interactions between parent and child temperament dimensions were better predictors of psychopathology than child temperament dimensions alone. A combination of high child novelty seeking and high parent novelty seeking was associated with attention problems, and high child and parent harm avoidance was associated with high internalizing symptomatology. Additionally, high child and parent persistence was related to low externalizing symptomatology. In sum, parent temperament can have a significant influence on the association between child temperament traits and the development of psychopathology.

I have presented both theoretical and empirical research demonstrating that interactions of child and parent temperament may have important effects on developmental outcomes; however, it is important to explore exactly what constitutes a "good fit" between parent and child temperament. Chess and Thomas (1977) note that parents may have difficulty understanding a

child who has a temperament different from their own (p. 76) but having a good fit does not necessarily mean that the parent and child are the same or even similar in all dimensions of temperament, nor is it appropriate to say that a good fit means that parent and child are opposites. In a dyadic relationship, each member will bring differing temperamental characteristics which may clash or complement the other person (Galambos & Turner, 1999). Within the context of the relationship, it is possible that a characteristic of one individual may either exacerbate or even suppress (for good or ill) a characteristic of the other individual. Thus, the assumption is that a good fit of temperaments is one in which characteristics complement rather than clash. The colloquialism that “opposites attract” gives anecdotal evidence to the idea that, often, having opposite characteristics can be complementary. For example, Galambos and Turner (1999) found that there was less perceived relational conflict when fathers were low in adaptability and daughters were high in adaptability. However, as daughters’ adaptability decreased, perceived levels of conflict also increased. In this situation, these opposing characteristics may create a kind of balance. However, this does not mean that having similar characteristics cannot be complementary, as demonstrated in a study by Rettew and colleagues (2006), which found that high levels of parent and child persistence is associated with low externalizing symptomatology. It may be, then, impossible to make blanket assumptions about what temperaments will complement and which will clash. Indeed, within one dyadic relationship, the two individuals may possess both characteristics that clash and characteristics that complement. Thus, it is important to adopt an approach that allows for examination of multiple temperament dimensions.

The exploration of goodness-of-fit in the context of compatible temperament dimensions must also take into account the nature of the dyadic relationship. It should not be assumed that in any given dyad that the same two temperament traits will be compatible or incompatible. The focus of this study is on the parent-child relationship. The dynamics of this relationship are very different from other relationships, such as those between partners, coworkers, or friends, in that the balance of power is not equal. While the child does have the power to influence their parent, it is most often that the child is required to adjust to the attitudes, expectations, and demands of the parent (Paterson & Sanson, 1999).

In extant literature on adolescent temperament as it interacts with parent characteristics (mostly looking at parenting behaviors), a common outcome of interest is the parent-child relationship. However, following the goodness-of-fit model, interactions of parent and adolescent temperament may have a much broader impact on adolescent development beyond the parent-child relationship. I propose to examine the interaction of parent and adolescent temperament as predictive of adolescent developmental outcomes, specifically the emotional regulatory system.

1.4 - The Emotional Regulatory System

The current study will examine three aspects of the emotional regulatory system: emotion regulation, emotion lability, and strategies of emotion regulation. Shields and Cicchetti (1997, 1998) identify two aspects of the emotional regulatory process: emotion regulation and emotion lability/negativity. ‘Emotion regulation’ refers to the ability to exercise a certain amount of control over one’s emotional states. This may manifest in engaging in efforts to change one’s emotional state, but may also include initiation and maintenance of emotional states. Additionally, regulation of emotional states may be in effort to change frequency of occurrence of certain states, modulate intensity of emotions, or control duration of emotions (Eisenberg et al., 2000). Engagement in emotion regulation usually involves some component of goal attainment. The goal can be as simple as not liking the way one is feeling and wanting to change it or an effort to meet social expectations (Eisenberg et al., 2000; Dunsmore et al., 2013).

It is also important to note that emotion regulation is distinct from emotion-related behavioral regulation (Eisenberg & Zhou, 2000). Emotion regulation refers to the control of what one is feeling internally. Emotion-related behavioral regulation refers to engagement in overt behaviors such as controlling facial expressions or other bodily reactions such as striking out in anger or literally “jumping-for-joy.” Eisenberg and Zhou (2000) emphasize that both cognitive and behavioral strategies can be used to accomplish emotion regulation and emotion-related behavioral regulation. For example, one might engage in deep breathing (an overt behavior) to make themselves feel calmer as well as to control their physical behavioral reaction to a situation. Conversely, cognitive strategies such as changing one’s focus of attention can similarly aid in changing feelings or controlling behavioral reactions.

The second aspect of the emotional regulatory process, emotion lability/negativity, refers to an individual's negative reactivity to emotion inducing situations, their ability to recover from emotional reactions, and their frequency of expressing negative emotions. High emotion lability/negativity is characterized by frequent mood swings or overly strong reactions to emotion-eliciting situations as well as frequently experiencing strong negative emotions (Shields & Cicchetti, 1998). Shields and Cicchetti (1998) define emotion lability/negativity and emotion regulation as related, but distinct, aspects of the emotional regulatory system. Following Calkins (1994), who suggested that behavioral traits such as reactivity to environmental stimuli may be influential in the development of emotion regulation, Kim-Spoon, Cicchetti, and Rogosch (2013) conducted a longitudinal study to determine the developmental relationship between emotion lability/negativity and emotion regulation. In support of Calkins' (1994) theory, the authors found that emotional lability/negativity is predictive of later emotion regulation ability, but that emotion regulation does not predict later emotion lability/negativity.

In exploration of the emotional regulatory system, in addition to emotion regulation and emotion lability, it is also important to include strategies of emotion regulation because different strategies for emotion regulation may have markedly different effects on well-being (Gross & John, 2003). Cognitive reappraisal is one strategy for emotion regulation that involves actively changing the way one thinks about the emotion eliciting stimuli. In this way, the individual may experience the exact same situation or stimuli but control its emotional impact. For example, if someone is experiencing anger at a friend who hurt them, one might try to see the perpetrator's action as inadvertent. While this may not completely dissipate feelings of hurt or anger, it allows the individual to put those feelings into a different perspective. Expressive suppression is another strategy for emotion regulation that focuses on inhibition of emotion-related behavior.

Expanding on the previous example of an individual being angry with a friend for hurting them, the individual might attempt to regulate their emotion by not showing their friend how they feel. This may manifest in suppressing facial expressions and even managing vocal tone and verbal responses.

Research on the use of cognitive appraisal shows it to be a successful strategy for not only controlling behavioral expression but also modulating the intensity of the experienced emotion (Gross & John, 2003). Expressive suppression is successful in decreasing experience of positive emotion but not negative emotion (Gross & Levinson, 1997). Indeed, expressive

suppression is not only an ineffective strategy for regulation of negative emotions but may also have cognitive costs such as memory impairment (Richards & Gross, 2000), and social and physical costs, such as increased stress and blood pressure, as well (Butler et al., 2003). Thus, it is not enough merely to attempt to engage in emotion regulation, how one engages in emotion regulation is of vital importance.

1.5 - Temperament and the Emotional Regulatory System

Because the definition of temperament includes aspects of reactivity, emotionality, and regulation, some researchers do not wholly distinguish between temperament and emotion regulation. Rothbart and Sheese (2007) go so far as to say that they do not consider temperament and emotion regulation to be distinct entities, nor do they assert that one causes the other. However, Rothbart and Sheese (2007) do acknowledge that certain aspects of emotion regulation, such as regulation strategies, are separate from, though possibly influenced by, temperament. Despite the stance by Rothbart and Sheese (2007) on the relation of temperament to emotion regulation, other views hold that they may be viewed as related but distinct entities. Underwood (1997) emphasizes that while temperament and emotion regulation may be linked, the role of early socialization in the development of good emotion regulation skills should not be disregarded. Calkins (2004) also emphasizes that although emotional regulatory processes may be related to temperament, they are heavily influenced by environmental factors which contribute to maturation and development. This view is in line with the goodness-of-fit model, which states that biologically based temperament should not be directly related to adjustment or maladjustment. Rather, it is the interaction of temperament and environmental context that influences developmental outcomes (Lerner & Lerner, 1983).

Additionally, the aspect which makes Rothbart and Derryberry's (1981) definition of temperament unique lies in the fact that it encompasses more than just aspects of reactivity and regulation as relating to emotionality but also includes activity level, orienting, and executive attention (Rothbart et al., 2004). Thus, temperament is a much broader concept. Approaching this issue from a perspective that is in line with the goodness-of-fit concept, Yap and colleagues (2007) distinguish temperamental emotionality from emotion regulation. The authors state that temperamental emotionality is a biologically based, enduring emotional response tendency, whereas emotion regulation is the process by which such predispositions are altered in response to environmental demands for the purpose of goal attainment. Development of active methods of

emotion regulation becomes more evident over the course of the first and second years of life (Calkins, 2004). As such, Yap and colleagues argue that emotion regulation is a product of individual temperament, brain maturation, and the environment. Specifically, they present a theoretical model in which emotion regulation is a product of the relationship between the interaction of adolescent temperament and family processes (parent emotion regulation, parent socialization, and parent temperament) and is a predictor of adolescent depression. In the current study, I argue that temperament and emotion regulation are distinct entities in that, although certain biologically based dispositions may influence the development of emotion regulation, environmental factors (such as parent temperament) may interact with temperament to influence emotion regulation abilities.

The conceptual difference between specific dimensions of temperament and emotion lability/negativity also merits some exploration. Negative affect as a dimension of temperament encompasses tendencies to negative emotionality which, conceptually, sounds similar to the definition of emotion lability/negativity. Indeed, with the inclusion of experience of negative emotions in the definition of emotion lability/negativity, it may be difficult to distinguish it from the temperament dimension of negative affect, and Dunsmore and colleagues (2013) assert that emotion lability/negativity may be more strongly related to temperament or individual differences than emotion regulation ability. Given the conceptual and measurement overlap of these constructs, for the purposes of the current study, I will only be looking at emotion lability (i.e., removing the negativity questions from the measure of emotion lability/negativity). Without the inclusion of emotion negativity, emotion lability may be considered conceptually distinct from temperament.

Many empirical studies support the theoretical distinction of temperament and emotion regulation by demonstrating that emotion regulation is a better predictor of poor developmental outcomes than temperament alone. Blair and colleagues (2004) found that emotion regulatory coping was a stronger predictor of problem behaviors than temperament alone. Additionally, emotion regulation moderated the relationship between having a difficult temperament and exhibiting problem behaviors. Similarly, Tamas and colleagues (2007) found that temperamentally based negative emotionality was not predictive of depression and suicidality, whereas poor emotion regulation was predictive of suicidality. According to Lerner and Lerner (1983), under the goodness-of-fit framework, this should not be surprising, as they assert that

temperament should always be examined in the context of the environment. Specifically, it should be the interaction of temperament with the environment that is predictive of adaptive or maladaptive outcomes. Regardless, it is still a commonly held view that certain temperamental styles may place children at risk for developing adjustment problems (e.g., Frick & Morris, 2004). Eisenberg and colleagues (2001) state that this may be because certain temperamental styles, specifically negative emotionality, may impair the development of emotion regulation skills, which in turn may lead to behavior problems. However, to my knowledge, no study has examined the association between temperament and emotion regulation ability, either as a direct effect of temperament on emotion regulation or as an interactive effect between temperament and environment as influential on the development of emotion regulation ability.

A few studies have found that temperament is predictive of use of emotion regulation strategies. Jaffe, Gullone, and Hughes (2010) found that children (grades 4-6) who were high in temperament based approach were more likely to use reappraisal than suppression as an emotion regulation strategy. Children who had low temperament based flexibility and low positive mood were more likely to use suppression as an emotion regulation strategy. Santucci and colleagues (2008) examined emotion regulation strategies of young children aged 4-7 in a delayed gratification task. High temperament based negative affectivity was associated with the use of maladaptive emotion regulation strategies, but temperament was not associated with the use of adaptive emotion regulation strategies.

1.6 - The Current Study

The current study proposes to examine the effect of interactions of parent and adolescent temperament on adolescent emotional regulatory system. Specifically, I will examine interactions of three temperament dimensions: surgency, negative affect, and effortful control. Following the goodness-of-fit hypothesis, it is expected that different combinations of parent and adolescent temperament dimensions will be differentially related to various aspects of the emotional regulatory system, such that interactions between parent and adolescent temperament dimensions will be related to emotion regulation ability and emotional lability among adolescents. Additionally, it is expected that specific interactions between parent and adolescent temperament will be predictive of adolescent emotion regulation strategy. Based on extant research linking temperament and emotion regulation, I will examine four specific hypotheses with regard to parent and adolescent temperament interactions.

First, it is hypothesized that adolescent and parent effortful control will interact to predict specific aspects of the emotional regulatory system. Given that deficits in effortful control have been associated with poor emotion regulation and high emotion lability (Eisenberg et al., 1995; Rothbart, Posner, & Rosicky, 1994), it is expected that high adolescent effortful control will be related to high emotion regulation ability and low emotional lability. Although no study has examined the relationship between effortful control and emotion regulation style, extant literature has established that attentional control, which is a major component of effortful control, is necessary for cognitive reappraisal (Jaffe et al., 2010) and that the use of cognitive reappraisal is taxing on self-control resources (Sheppes & Meiran, 2008). Thus, it is expected that high effortful control will be related to high cognitive reappraisal and low suppression. It is expected that high parent effortful control will moderate this relationship by making these associations even stronger.

The second hypothesis is that adolescent and parent negative affect will interact to predict specific aspects of the emotional regulatory system. Extant research establishes that negative affectivity is strongly related to poor emotion regulation (Eisenberg, 2000) and high emotional lability (Frick & Morris, 2004) as well as greater use of maladaptive emotion regulation strategies (Jaffe et al., 2010; Santucci et al., 2008). Thus, it is expected that high adolescent negative affect will be associated with poor emotion regulation, high emotional lability, and high levels of suppression and that parent negative affectivity will moderate to exacerbate this relationship.

The third hypothesis is that, although adolescent negative affectivity may be related to poor outcomes in the emotional regulatory system, certain aspects of parent temperament, specifically, effortful control, may function to attenuate these relationships. Specifically, it is expected that adolescent exposure to a parent with high effortful control will weaken the relationship between adolescent negative affect and poor emotion regulatory outcomes. The final hypothesis is in regard to adolescent surgency. Extant research shows that surgency is often associated with poor control of negative emotions such as anger and frustration (d'Acremont & Van der Linden, 2007; Jaffe et al., 2010), but may actually be related to greater use of cognitive reappraisal as an emotion regulation coping strategy and lower use of

suppression (Jaffe et al., 2010). It is expected that exposure to high parent effortful control may attenuate the negative effects of surgency on emotion regulation and lability, whereas it strengthens the relation of surgency with the adaptive regulation style of cognitive reappraisal.

Another important factor to consider when studying dynamics of parent-adolescent dyads is gender. The gender of the adolescent may be an important factor in determining temperament and environment interactions. Gordon (1981) found that boys and girls with difficult temperaments reacted differentially to controlling adults when working on a task. Boys spent less time on the task and were more withdrawn while girls spent more time on the task. Additionally, parental strictness was associated with less persistence for girls with difficult temperaments but not for boys. Galambos and Turner (1999) found that high temperamental activity in girls was related to more conflict with parents who had low temperamental activity, but high temperamental activity in boys had no associations with parental conflict. Research also shows that the gender of the parent may be equally important. For example, Kawaguchi and colleagues (1998) found that low adaptability in both fathers and daughters was associated with greater conflict, but low adaptability of fathers and sons was not related to conflict. With regard to mothers with low adaptability, greater conflict was found with daughters who had high activity and with sons who had low activity. Unfortunately the data set for the current investigation has information collected from only one of the adolescent's caregivers and consists of very few fathers; thus, the current study will only look at contributions of the adolescent's gender.

Chapter 2 – Method

Participants were part of a four year longitudinal study which began in 2014. Data from the first wave of data will be used for analyses in the current study. Participants were adolescents ages 13-14 ($M = 13.51$; $SD = .51$) and their primary caregiver. One hundred fifty seven (87 male) adolescents and their caregivers (142 mothers) participated in the first wave of this study. Adolescents identified as 78 percent Caucasian, 11.3 percent African American, 4.2 percent biracial, and 6.5 percent other. Parents age ranged from 31-61 years of age ($M = 42$ years; $SD = 6.58$.) and identified as 91.1 percent Caucasian, 7.6 percent African American, and 1.3 percent biracial. At the time of data collection, 66.2 percent of parents were married, 14.6 percent had never been married, 13.4 percent were divorced, 4.5 percent were separated from their partner, .6 percent were widowed, and .6 percent were living with a partner as though they were married. Mean household income was between \$25,000 and \$34,999 per year.

2.1 - Procedures

Participants were recruited from towns in Southwestern Virginia. Participants were contacted via phone lists purchased from contact companies, snowball sampling (word-of-mouth), by responding to flyers, or by responding to notices placed on the internet. Families who were eligible (i.e., with an adolescent aged between 13 and 14 years) and were interested in the study were asked to call the research office. Research assistants described the nature of the study to the interested individuals over the telephone and invited them to participate. Given this recruitment strategy, it was not possible to know what proportion of people who were exposed to study advertisements responded. Data collection took place at the University's offices. Upon arrival, the parent and the adolescent were escorted to separate interview rooms. Measures for the study were administered by two trained research assistants, one with each participant. Prior to the interview, parent consent and adolescent assent were obtained. The interviewers read the instructions to the participants and were present while the participants filled out the questionnaires and completed computer tasks. Parents and adolescents received monetary compensation for participating. All procedures were approved by the University's institutional review board.

2.2 - Measures

Demographics. Basic demographic information of age, gender, race, and family income was collected. Dummy coding was used for gender (0 = boys, 1 = girls) and for race (0 = White, 1 = non-White). Family income was a continuous variable ranging from 1 = \$0 to 15 = \$200,000 or more per year. See Appendix A for the complete measure for parents and Appendix B for the complete measure for adolescents.

Adolescent temperament. The Early Adolescent Temperament Questionnaire Revised Short Form (EATQ-R) was used to measure adolescent temperament (Capaldi & Rothbart, 1992). This measure is adolescent self-report and targets common experiences for adolescents in which temperament dimensions may be expressed. Items are rated on a 5 point scale from 1 = almost always untrue to 5 = almost always true. The short form of the EATQ assesses three dimensions of temperament: surgency (including assessment of high intensity pleasure, fear, and shyness), negative affect (including assessment of frustration, depressive mood, and aggression), and effortful control (including assessment of inhibition, activation, and attention). See Appendix C for the complete measure. Scale reliability (Cronbach's Alpha) from the current sample are as follows: $\alpha = .75$ for surgency, $\alpha = .86$ for negative affect, $\alpha = .81$ for effortful control.

Parent temperament. The Adult Temperament Questionnaire short form (ATQ) was used to measure parent temperament (Evans & Rothbart, 2007). Primary caregivers answered items on a seven point scale ranging from 1 = extremely untrue of you to 7 = extremely true of you, and X = not applicable. Similar to the EATQ-R, the ATQ measures Surgency (including assessment of high intensity pleasure, fear, and shyness), Negative Affect (including assessment of frustration, depressive mood, and aggression), and Effortful Control (including assessment of inhibition, activation, and attention). See Appendix D for the complete measure. Scale reliability (Cronbach's Alpha) from the current sample are as follows: $\alpha = .77$ for Surgency, $\alpha = .74$ for Negative Affect, $\alpha = .80$ for Effortful Control.

Emotion regulation. The Emotion Regulation Checklist (ERC) was used to measure emotion regulation and emotion lability (Shields and Cicchetti, 1997). The Emotion Regulation subscale reflects processes central to adaptive regulation such as emotional self-awareness and empathy. Adolescents rated items on a four point scale from 1 = rarely/never to 4 = almost always. As described in the introduction, the scale includes items related to aspects of negative emotions as well as lability. In order to avoid any confounds relating to measurement, I have

examined items on both the temperament and emotional lability questionnaires to ensure that individual items do not overlap between the measures. In general, the emotional lability scale focuses on tendencies to mood swings or inappropriate displays of emotion, whereas the temperament scale focuses on tendencies to specific emotions and actions. See Appendix E for the full measure and Appendix F for a list of items removed (i.e. for negativity and/or items too similar to questions on the temperament questionnaire). Scale reliability (Cronbach's Alpha) from the current sample are as follows: $\alpha = .52$ for Emotion Regulation, $\alpha = .74$ for Emotion Lability.

Emotion regulation strategies. The emotion regulation questionnaire (ERQ) consists of ten items that assess use of two different emotion regulation strategies: reappraisal and suppression. Reappraisal refers to regulating emotions by changing cognitions relating to the emotion eliciting situation in such a way that it alters its emotional impact, and suppression refers to regulating emotions by inhibiting expression of specific emotions (Gross & John, 2003). Adolescents rated items on a seven point scale from 1 = strongly disagree to 7 = strongly agree. See Appendix G for the complete measure. Scale reliability (Cronbach's Alpha) from the current sample are as follows: $\alpha = .68$ for Suppression, $\alpha = .79$ for Reappraisal.

2.3 - Data Analytic Plan

Descriptive statistics were examined for distributions and outliers for all study variables. Bivariate correlations were calculated in order to determine associations among demographic variables (age, gender, race, and family income) and all study variables. Demographic variables that were significantly correlated with the outcome variables of emotion regulation and internalizing behavior are included as covariates in the main analyses. Structural Equation Modeling (SEM) analyses was used to test the hypotheses and was conducted using Amos statistical software. Overall model fit indices were examined using the following measures: (1) χ^2 value, (2) degrees of freedom, (3) corresponding p-value, (4) Root Mean Square Error of Approximation (RMSEA), and (5) Confirmatory Fit Index (CFI). An RMSEA value less than .06 and a CFI value equal to or greater than .95 indicated a good fit (Hu & Bentler, 1999). An α level of .05 was used for all statistical tests except in the case of the interactions. An $\alpha = .10$ for testing interactions, considering the low power that characterizes analyses of moderator effects in quasi-experimental research designs (McClelland & Judd, 1993).

Four separate series of SEM analyses were conducted to test the proposed interaction of adolescent and parent temperament in relation to the emotion regulatory system. The four components of the emotional regulatory system (ER, lability, reappraisal, and suppression) were analyzed in the same model. Analysis combinations are as follows: Models 1 and 2 tested interactions of adolescent negative affect by parent negative affect and effortful control (see Figures 1 and 2). Model 3 tested the interaction of adolescent effortful control by parent effortful control (see Figure 3) and model 4 tested the interaction of adolescent surgency by parent effortful control (see Figure 4).

To probe significant interactions, simple effects were tested by running separate regressions on adolescent surgency, negative affect, and effortful control including parent negative affect, and effortful control as conditional moderator variables (Holmbeck, 2002). Gender differences were assessed using a two-group SEM model testing equality constraints first for each individual main effect and then for each individual interaction effect.

Chapter 3 – Results

3.1 - Preliminary Analyses

Descriptive statistics for and correlations among the study variables are presented in Table 1. Data were screened for outliers and multivariate non-normality using Mahalanobis's distance values. Eight cases were shown to have a Mahalanobis's distance score greater than the critical value [$\chi^2(4) = 18.47, p < .001$]. We compared models that included or excluded these cases and found significant differences in model fit and path coefficients; thus, the cases were excluded from the main analyses. Skewness and kurtosis were also examined and fell within acceptable ranges (skewness less than 3 and kurtosis less than 10; Kline, 1998). Multivariate General Linear Modeling (GLM) analysis of testing effects of demographic characteristics (including adolescent age, gender, race, and family income) revealed that family income was significantly related to the outcome of emotion suppression ($F = 4.38, p = .04$), thus, family income was included as a covariate in the main analyses. Adolescent age ($F = .57, p = .83$), gender ($F = .773, p = .66$), and race ($F = .961, p = .48$) were not significantly related to the study's outcome variables and were not included as covariates in the main analyses.

3.2 - Hypothesis Testing

Model 1. The first model tested the interaction of adolescent and parent negative affect on the adolescent emotional regulatory system (emotion regulation, emotion lability, suppression, and cognitive reappraisal; see Figure 1). The model was first fit as a single group model, then, two group model tests were performed by systematically constraining the paths first for each main effect individually and then for each interaction effect individually. If constraining a specific path resulted in a significantly poorer model fit as evidenced by a Wald test, the path was allowed to vary freely. Table 3 shows all model fit statistics and model fit comparisons for Model 1. Results of testing two-group models for gender differences revealed that model fit was significantly worse when main effect paths between adolescent negative affect and adolescent emotion regulation (Wald test: $\Delta\chi^2 = 9.244, \Delta df = 1, \Delta p = .002$) and between parent negative affect and adolescent emotion regulation (Wald test: $\Delta\chi^2 = 9.390, \Delta df = 4, \Delta p = .050$) were constrained to be equal between males ($n = 72$) and females ($n = 72$). Thus, in the final model, these paths were allowed to vary freely while equality constraints for all other paths were kept. The final model fit was acceptable ($\chi^2 = 18.291, df = 16, p = .307, CFI = .980, RMSEA = .031$).

Parameter estimates for Model 1 may be found in Table 2 and standardized estimates are displayed in Figure 1. Adolescent negative affect was significantly related to emotion regulation for girls ($b = -.242$, $SE = .074$, $p = .001$) but not for boys ($b = -.005$, $SE = .069$, $p = .942$). For both boys and girls, adolescent negative affect was significantly related to emotion lability ($b = .564$, $SE = .049$, $p = .001$), suppression ($b = .407$, $SE = .179$, $p = .023$), and reappraisal ($b = -.344$, $SE = .137$, $p = .012$). Parent negative affect was not found to be significantly related to the adolescent emotion regulatory system and no interaction terms were significant (see Table 2).

Model 2. The second model tested the interaction of adolescent negative affect and parent effortful control on the adolescent emotional regulatory system (see Figure 2). Two group model testing procedures for gender differences were the same as for Model 1. Table 4 shows all model fit statistics and model fit comparisons for Model 2. Results of testing two-group models for gender differences revealed that model fit was significantly worse when the path between adolescent negative affect and adolescent emotion regulation was constrained to be equal between males and females (Wald test $\chi^2 = 9.190$, $df = 1$, $p = .002$). Thus, in the final model, this path was allowed to vary freely, whereas all other paths were constrained to be equal for males and females. The final model fit was acceptable ($\chi^2 = 19.241$, $df = 17$, $p = .315$, $CFI = .981$, $RMSEA = .030$). Parameter estimates for Model 2 may be found in Table 2, and standardized estimates are displayed in Figure 2. Similar to Model 1, adolescent negative affect was significantly related to emotion regulation for girls ($b = -.237$, $SE = .075$, $p = .002$), but not for boys ($b = -.003$, $SE = .069$, $p = .967$). For both boys and girls, adolescent negative affect was significantly related to emotion lability ($b = .561$, $SE = .050$, $p = .001$), suppression ($b = .396$, $SE = .180$, $p = .028$), and reappraisal ($b = -.326$, $SE = .136$, $p = .017$). Parent negative affect was not found to be significantly related to the adolescent emotion regulatory system and no interaction terms were significant (see Table 2).

Model 3. The third model tested the interaction of adolescent effortful control and parent effortful control on the adolescent emotional regulatory system (see Figure 3). Two group model testing procedures for gender differences were the same as for Models 1 and 2. Table 5 shows all model fit statistics and model fit comparisons for Model 3. Results of testing two-group models for gender differences revealed that model fit was significantly worse when the path between the interaction between adolescent and parent effortful control and adolescent suppression was constrained to be equal between males and females (Wald test $\chi^2 = 3.745$, $df = 11$, $p = .053$).

Thus, in the final model, this path was allowed to vary freely, whereas all other paths were constrained to be equal for males and females. The final model fit was acceptable ($\chi^2 = 11.613$, $df = 17$, $p = .823$, CFI = 1.00, RMSEA = .000). Parameter estimates for Model 3 may be found in Table 2, and standardized estimates are displayed in Figure 3. The interaction of parent and adolescent effortful control was significantly related to suppression for girls ($b = .816$, SE = .303, $p = .007$) but not for boys ($b = -.066$, SE = .344, $p = .847$). No other interaction terms were significant (see Table 2). To examine the significant interaction effects, simple slopes were calculated using regression examining the effects of the adolescent temperament variable on the dependent variable at one standard deviation above and one standard deviation below the mean of the parent temperament variable (see Holmbeck, 2002). In Figure 5, for girls with parents low in effortful control, low adolescent effortful control was related to higher suppression ($b = -.955$, SE = .340, $b^* = -.471$, $t = -2.813$, $p = .006$). In contrast, for girls with parents high in effortful control, adolescent effortful control was not related to suppression ($b = .362$, SE = .348, $b^* = .178$, $t = 1.039$, $p = .303$). For both boys and girls, adolescent effortful control was significantly related to emotion regulation ($b = .212$, SE = .052, $p = .001$), emotion lability ($b = -.349$, SE = .059, $p = .001$), and suppression ($b = -.348$, SE = .179, $p = .051$). Parent effortful control was not found to be significantly related to the adolescent emotion regulatory system.

Model 4. The fourth and final model tested the interaction of adolescent surgency and parent effortful control on the adolescent emotional regulatory system (see Figure 4). Two group model testing procedures for gender differences were the same as for Models 1, 2, and 3. Table 6 shows all model fit statistics and model fit comparisons for Model 4. Results of testing two-group models for gender differences revealed that model fit was significantly worse when paths between the interaction of adolescent surgency and parent effortful control and adolescent emotion lability (Wald test: $\chi^2 = 3.382$, $df = 10$, $p = .050$) and suppression (Wald test: $\chi^2 = 9.438$, $df = 10$, $p = .002$) were constrained to be equal between boys and girls. Thus, in the final model, these paths were allowed to vary freely, whereas all other paths were constrained to be equal for males and females. The final model fit was acceptable ($\chi^2 = 13.930$, $df = 16$, $p = .604$, CFI = 1.000, RMSEA = .000). Parameter estimates for Model 4 may be found in Table 2, and standardized estimates are displayed in Figure 4. Several interaction effects were found. The interaction of adolescent surgency and parent effortful control was significantly related to emotion lability for boys ($b = -.196$, SE = .120, $p = .103$) but not for girls ($b = .108$, SE = .080, p

= 177). The interaction of adolescent surgency and parent effortful control was also significantly and positively related to suppression for boys ($b = .703$, $SE = .120$, $p = .018$) but negatively related to suppression for girls ($b = -.491$, $SE = .203$, $p = .016$). For both boys and girls, the interaction of adolescent surgency and parent effortful control was significantly related to cognitive reappraisal ($b = -.239$, $SE = .143$, $p = .094$). In addition, adolescent surgency was found to be negatively related to suppression ($b = -.514$, $SE = .137$, $p = .001$), but it was not directly related to emotion lability, suppression or reappraisal, nor was parent effortful control found to be directly related to the emotion regulatory system (see Table 2).

Significant interactions in Model 4 were probed by calculating simple slopes in the same manner as for Model 3. In Figure 6, for boys with parents low in effortful control, adolescent surgency was related to higher emotion lability ($b = -.193$, $SE = .090$, $b^* = -.313$, $t = -2.133$, $p = .037$), whereas for boys with parents high in effortful control, surgency was not related to emotion lability ($b = -.043$, $SE = .102$, $b^* = -.070$, $t = -.423$, $p = .674$). In Figure 7, for adolescents with parents low in effortful control, high adolescent surgency was related to higher cognitive reappraisal ($b = .354$, $SE = .159$, $b^* = .263$, $t = 2.223$, $p = .028$). In contrast, for adolescents with parents high in effortful control, surgency was not related to cognitive reappraisal ($b = .015$, $SE = .152$, $b^* = .01$, $t = .099$, $p = .921$). In Figure 8, for boys with parents low in effortful control, high adolescent surgency was related to low suppression ($b = -1.042$, $SE = .368$, $b^* = -.580$, $t = -2.833$, $p = .006$) whereas for boys with parents high in effortful control, surgency was not related to suppression ($b = .064$, $SE = .281$, $b^* = .036$, $t = .228$, $p = .820$). In Figure 9, for girls with parents high in effortful control, high adolescent surgency was related to low suppression ($b = -.922$, $SE = .269$, $b^* = -.542$, $t = -3.430$, $p = .001$), whereas for girls with parents low in effortful control, surgency was not related to suppression ($b = -.148$, $SE = .239$, $b^* = -.087$, $t = -.620$, $p = .538$).

Chapter 4 - Discussion

The purpose of the current study was to examine interactions of adolescent and parent temperament as related to the development of the adolescent emotion regulatory system. It was hypothesized that parent temperament would act as an important contextual factor for adolescent temperament, in that it would moderate the relationship between specific adolescent temperament dimensions and outcomes in the emotion regulatory system. The proposed hypotheses regarding the interaction of parent and adolescent temperament in relation to the adolescent emotion regulatory system were partially supported. Between the parent temperament dimensions tested (surgency and effortful control) only parent effortful control was found to moderate the relationship between specific adolescent temperament dimensions and aspects of the emotion regulatory system. Several gender differences were also found for both main and interaction effects. Adolescent negative affect was negatively related to emotion regulation for girls only. Parent effortful control moderated the relationship between adolescent effortful control and suppression use also for girls only. Parent effortful control moderated the relationship between adolescent surgency and emotion lability only for boys, and parent effortful control moderated the relationship between adolescent surgency and suppression for both boys and girls, but in opposite directions. For girls, the interaction term was negatively related to suppression, and for boys, it was positively related to suppression use.

4.1 - Direct Effects of Adolescent Negative Affect

Adolescent negative affect was significantly and negatively related to emotion regulation for girls only. For both boys and girls, negative affect was positively related to emotion lability and suppression, and negatively related to cognitive reappraisal. Additionally, parent negative affect and effortful control did not act as significant moderators in this relationship. These findings suggest that adolescent girls who are high in negative affect may be at risk for poor emotion regulation skills. This is consistent with extant literature that links temperamentally based negative affect with a number of anxiety and mood disorders characterized by poor emotion regulatory skills (Brown, Chorpita, & Barlow, 1998; Pompili et al., 2014). Wills and Dishion (2004) posit that temperament is linked with problem behaviors through two pathways: socialization processes and self-control. Although the authors refer to self-control in a broader sense, emotion regulation may be considered an aspect of overall self-control (Fox & Calkins,

2003). Thus, for adolescent girls, negative affect may be a risk factor for potentially poor emotion regulation skills. It is possible that this connection exists because higher levels of negative emotions such as frustration, aggression, and depression are much more difficult to regulate than other emotions. Adolescents frequently experience more intense emotions than children and adults (Silk, Steinberg, & Morris, 2003), and neurological research shows that cognitive systems that contribute to emotion regulation are still developing during adolescence (Spear, 2000). For adolescents who already possess a temperamental tendency to negative emotions, these changes in emotional experience may make it even more difficult for them to successfully regulate their emotions. Conversely, adolescents who do not have a temperamental tendency to experience high levels of negative emotions may not experience difficulty in regulating emotions because they have less pressing need for regulation.

These findings may also be due, in part, to the self-report method of measuring emotion regulation used in the current study. According to objective self-awareness theory, negative affect is the result of self-awareness of discrepancies between desired and perceived states (Fejfar & Hoyle, 2000). In a meta-analysis of studies seeking support for objective self-awareness theory, Fejfar and Hoyle (2000) found a consistent positive correlation between self-awareness and negative affect and that this relationship was stronger for women than for men. Thus, it is possible that adolescents with high negative affect (again, specifically, girls) are more aware of their own dysregulation. That is, when answering questions about how they experience and deal with their emotions, they may be more aware of instances of dysregulation because they more frequently experience situations in which they deal with intense negative emotions compared to adolescents with low negative affect. Extant literature also shows that depressed individuals are often more accurate in self-judgments about errors made on a task and less accurate in self-judgments concerning correct answers when no external feedback was given (Dunn et al., 2007). Although these findings are not directly related to the current study, it does suggest that high negative affect may be associated with more accurate judgments regarding failure. Applied to the current study, it provides some support for the idea that adolescents high in negative affect may be more aware of (and therefore, more likely to report) their own difficulties in regulating emotion.

Although negative affect was found to be related to emotion regulation for girls, this was not the case for boys. This raises some questions as to why this specific temperament trait would be related to a potentially negative outcome for girls but not for boys. One possible explanation is that experience and expression of negative affect, especially frustration and aggression, may be seen as more socially acceptable for boys than for girls (Galambos & Turner, 1999). If we consider that the concept of emotion regulation is the altering of emotional states for the purposes of goal attainment, boys, then, may have less need to actively regulate these emotions in order to attain goals. A certain amount of aggression expression within a peer relationship may be accepted and even expected. Within a relationship with a parent or other adult, such emotions may be attributed to the ubiquitous (if not scientifically accurate) colloquialism that “boys will be boys.” Thus, the reactions (approval or disapproval) of others may be a factor in adolescent self-perceptions of their own regulation and emotion experience. Girls may experience more disapproving feedback for expressing frustration and aggression than boys.

Depression, as a component of temperamentally based negative affect, is perhaps a different matter than frustration and aggression. Although it is feasible that it is generally more culturally acceptable for boys to express aggression and frustration than girls, this does not necessarily hold true for depressive emotions. Extant literature shows that in pre-adolescence (10-12 years of age), no gender differences exist in the prevalence of depression or depressive emotions (Nolen-Hoeksema & Girgus, 1994). Boys tend to show higher levels of aggression than girls across all ages, but around the ages of 13-14 years, gender differences begin to emerge, with girls showing much higher rates of depression than boys (Hankin & Abramson, 2001; Nolen-Hoeksema & Girgus, 1994). Although the tendency to experience high levels of negative affect is considered a temperamental dimension, the situations that elicit said emotions are highly socialized. Two individuals with high temperamental negative affect may experience the same situation and yet have drastically different reactions (Fox & Calkins, 2003). Extant literature on gender differences in depression show that women may be more likely to base their self-esteem on relationships with others, in addition to being less assertive and feeling like they have less control over the outcome of life events (Nolen-Hoeksema & Girgus, 1994). Girls, then, may be at a higher risk than boys for experiencing depressive feelings due to socialization of emotions.

Extant literature also shows that there may be certain stressors unique to the experience of adolescent girls that may contribute to higher rates of depression among adolescent girls than boys. Girls are more likely to focus on the importance of social relationships and activities, whereas boys are more likely to engage in more physical activities in which successful peer relations are not as key (Ryba & Hopko, 2012). As such, girls are more likely to experience psychosocial stressors that may trigger depression (Thapar et al., 2012), as well as be more sensitive to these psychosocial stressors due to reliance on social relationships (Maughan, Colishaw, & Stringaris, 2013). Additionally, Hankin and Abramson (2001) suggest that pubertal and hormonal changes in adolescent girls, especially the onset of menses, may be stress factors that heighten risk for depression in adolescent girls that is not seen in boys. Thus, results may show that negative affect is negatively related to emotion regulation only for girls simply because girls experience more depressive feelings than boys. This explanation assumes that the effect relating negative affect to poor emotion regulation for girls is driven mostly by depression and not by frustration and aggression. However, the proposed explanations for gender differences regarding this effect need not necessarily work in isolation. Girls may experience more depressive feelings than boys and are also socially constrained to demonstrate less frustration and aggression, whereas boys may experience less depression and have less need to regulate expression of frustration and aggression due to social expectations.

Findings from the current study also show that adolescent negative affect, in both boys and girls, is positively related to emotion lability and suppression, and is negatively related to cognitive reappraisal. These findings provide empirical support for assertions by Eisenberg and colleagues (2001), as well as by Frick and Morris (2004), that high negative affect may be a temperamental vulnerability which may contribute to poor emotion regulation and, subsequently, may be related to development of psychopathology. The findings are also consistent with a study by Santucci and colleagues (2008) which found high temperamentally based negative affect in young children (4-7 years of age) to be related to greater use of maladaptive emotion regulation strategies (though low negative affect was not related to increased use of adaptive strategies). The current study shows that this relationship between negative affect and use of adaptive versus maladaptive regulation strategies is robust across age, from early childhood into adolescence. Though these results provide empirical support for some current theories regarding the relationship of negative affect and emotion regulation, they appear to be in conflict with the

goodness-of-fit hypothesis and Lerner and Lerner's (1983) assertion that temperament should only affect developmental outcomes as a function of the environmental conflict. Thus, if the goodness-of-fit hypothesis is correct, then there should be certain aspects of an adolescent's environment that may either exacerbate or attenuate these effects. In the next section I discuss the hypothesized moderators of the relationship between negative affect and the emotion regulatory system.

4.2 - Interaction Effects of Adolescent Negative Affect and Parent Negative Affect and Effortful Control

Building off of extant literature (e.g. Eisenberg et al., 2001) it was expected that adolescent negative affect might be related to the emotion regulatory system but, in keeping with Lerner and Lerner (1983), that this relationship would be dependent on the environmental context. Thus, it was hypothesized that high parent negative affect as a context for high adolescent negative affect may be detrimental to the adolescent emotion regulatory system and that parent effortful control would attenuate any direct effects of adolescent negative affect on the emotion regulatory system. This was not found to be the case. Parent negative affect was not related to any aspect of the adolescent emotion regulatory system directly or through interaction with adolescent temperament. This finding suggests that, although having high levels of negative affect may be a risk factor for poor emotion regulation for girls, and high emotion lability and maladaptive regulation strategies for both boy and girls, having a parent with high negative affect may not necessarily exacerbate this risk. Similarly, parent effortful control was not related to the adolescent emotion regulatory system, either directly or as a moderator.

Rothbart and colleagues (2004) posit that an adolescent's own effortful control may moderate the relationship between reactive aspects of temperament (i.e., negative affect and surgency) and outcomes in that effortful control may regulate reactive tendencies to specific emotions and behavioral impulses. Effortful control, then, is considered the regulatory aspect of temperament. Thus, I hypothesized that if a tendency towards negative affect was a reactive component of temperament that challenges emotion regulation abilities, then parent effortful control may moderate this relationship, in that it serves as context for the expression of temperament in relation to behavior. Specifically, the context of having a parent with high

effortful control may aid the adolescent in dealing with experiences of negative affect and improve their ability for emotion regulation. Results of the current study show that, for negative affect, this is not the case.

Though these findings appear to conflict with the goodness-of-fit hypothesis, it is possible that environmental contexts other than parent temperament may be important moderators for the relationship between negative affect and the emotion regulatory system. Yap and colleagues (2007) propose that, in addition to parent temperament, parents' own emotion regulation as well as parents' socialization of emotions may also interact with adolescent temperament to influence the development of emotion regulation. For adolescents with high negative affect, it may be especially important to have parents who are able to model good emotion regulation processes and strategies. Additionally, parents who actively teach their children about emotions and ways of dealing with emotions may provide an environment which attenuates for negative effect of high temperamental negative emotion (Yap et al., 2007). One way in which parents' emotion socialization may facilitate adolescents' own emotion regulation is through, language skills, especially language relating to the expression of emotions (Fox and Calkins, 2003).

Although parent temperament does not appear to serve as an environmental context for adolescent negative affect, for other dimensions of adolescent temperament in relation to the emotion regulatory system, parent temperament (parent effortful control in particular) does appear to be a significant environmental context. In the following sections I first explore other significant findings of the current study, which show parent effortful control to function as a context for the effect of adolescent temperament on the emotion regulatory system. Then, I explore the concept of effortful control and its development in greater detail as a means of understanding why parent effortful control interacts with certain aspects of adolescent temperament with others.

4.3 - Direct and Interaction Effects of Adolescent and Parent Effortful Control

In the current study, adolescent effortful control (for both boys and girls) was found to be directly and positively related to emotion regulation and negatively related to emotion lability and suppression. Adolescent effortful control was not found to be directly related to cognitive reappraisal. Although parent effortful control was not found to be directly related to the adolescent emotion regulatory system, the interaction of adolescent and parent effortful control

was significantly and negatively related to suppression only for girls. The results revealed that girls with low effortful control appeared to be vulnerable to showing high rates of suppression only when parent effortful control was also low. For girls with high effortful control, level of parent effortful control did not appear to affect rates of suppression. Thus, high parent effortful control appears to function as a contextual factor that attenuates the relationship between girls' effortful control and use of suppression. Following work by Luthar, Cicchetti, and Becker (2000), parent effortful control may be considered a *protective-stabilizing* variable, in that presence of parent effortful control appears to confer stability in adolescent use of suppression despite increasing risk as evidenced by low adolescent effortful control, but only for girls. It may be, then, that boys do not benefit as much as girls from parent effortful control, at least in terms of use of suppression as an emotion regulation strategy.

Although there are no extant studies that have examined the possibility of differential effect of parent factors/parenting on emotion regulation/strategies for boys versus girls, a number of studies do support the idea that some parenting factors may be more beneficial for girls in terms of adaptive outcomes than for boys and vice versa. For example, Kincaid and colleagues (2012) found that monitoring was a better protective factor against risky sexual behavior for boys than for girls and that parental warmth and emotional connection was a better protective factor for girls than for boys. Crosnoe, Erikson, and Dornbusch (2002) found that high household organization acted as a protective factor against delinquency for girls but not for boys. Similarly, Piko and Balazs (2012) found parental control to be more relevant to protection from substance use in adolescent boys, whereas parental responsiveness is more protective for girls. Taken together, the results of these studies indicate that although parent effortful control may not be as important for boys as it is for girls (again in the context of adolescent effortful control as it relates to use of suppression), there may be other parent factors, such as parental monitoring, that are similarly more salient for boys than for girls. A general trend in differential effects of parenting for girls and boys is that girls tend to benefit more from emotional support, whereas boys tend to benefit more from rational and material support (Piko, 2011). A possible explanation for why parent effortful control is more beneficial for girls than boys, in this context, is that extant literature shows that parents high in effortful control also display more empathy and warmth (Eisenberg et al., 2011; Rothbart et al., 1994). The connection between effortful

control and empathy is explored in more detail on page fifty-three. A direction for future research, then, could be to examine possible parent factors that may act as protective-stabilizing influences for boys who are low in effortful control.

4.4 - Interaction Effects of Adolescent Surgency and Parent Effortful Control on Emotion Lability

Although no previous studies have examined a direct relationship between adolescent surgency and emotion regulation/lability, extant literature shows surgency to be associated with mood disorders characterized by poor emotion regulation and high emotion lability (Dougherty et al., 2014), poor behavioral self-regulation such as obesogenic eating behaviors (Leung et al., 2014), and high occurrence of risk taking (Cooper, Agocha, & Sheldon, 2000). Results of the current study did not reveal a direct link between adolescent surgency and emotion regulation or emotion lability. However, for boys, parent effortful control was found to interact with adolescent surgency to influence emotional lability. The findings show that high surgency in adolescent boys is only related to increased emotion lability in the context of low parent effortful control. Again, it appears that parent effortful control acts as a protective-stabilizing variable, attenuating the relationship between adolescent surgency and emotion lability for boys. This finding is largely consistent with extant literature showing a positive correlation between impulsivity and emotion lability that is stronger for boys than for girls (Shea & Fisher, 1996). The current study further contributes to extant literature on adolescent surgency by showing that its connection to maladaptive outcomes such as emotion lability may be dependent on environmental context, and that parent factors can either attenuate or exacerbate the influence of temperamental surgency. Parent effortful control may act as a source of external regulation for boys with high surgency.

The reason why this relationship only appears to exist for boys is unclear, but research on impulsivity, which, though slightly different than the temperament dimension of surgency, is closely related, may offer some explanation. In general, boys are more likely to be impulsive than girls (Moffitt et al., 2001). Although current research does not offer empirical evidence as to why these sex differences exist (Moffitt et al., 2001), Chapple and Johnson (2007) suggest that the development of impulsivity and self-control, even from a temperamental basis, may be a result of gender socialization. Boys may be more likely to connect impulsiveness with positive social consequences such as masculine identity, whereas girls may experience negative

consequences for impulsiveness due to gender expectations. If these findings may be applied to adolescent surgency, then boys may be less likely to exercise control over their own surgency, in which case a source of external regulation, such as parent effortful control, may be especially important in attenuating the relationship between high surgency and emotion lability.

4.5 - Interaction Effects of Adolescent Surgency and Parent Effortful Control on Cognitive Reappraisal

Often, literature sheds the temperament trait of surgency in a bad light, especially for adolescents (e.g., Cooper et al., 2000; Dougherty et al., 2014; Leung et al., 2014). However, a major premise of the current study is that there is no *ideal* temperament. Temperament traits, in and of themselves, should not be considered “good” or “bad” in relation to developmental outcomes. Rather, temperament traits, as considered in the context of the individual’s environment, may either place the individual at higher risk for certain maladaptive outcomes or serve as a protective factor. Conversely, certain temperament traits, as considered in the context of the individual’s environment, may place the individual at an advantage for achieving certain adaptive outcomes (Lerner and Lerner, 1983). Thus, it is not surprising that, despite the number of risk factors associated with high surgency, extant research shows that there are positive outcomes associated with surgency as well. For example, Jaffe and colleagues (2010) found temperament-based approach (a similar concept to surgency) to be related to higher use of cognitive reappraisal in pre-adolescents (4th -6th grade). The authors posit that the tendency to social engagement and lack of inhibition that characterizes temperament-based approach may predispose children to be more open to considering alternate ways of looking at emotion-eliciting situations.

Although results of the current study did not find a direct relationship between adolescent surgency and cognitive reappraisal, a significant interaction was found between adolescent surgency and parent effortful control (for both boys and girls). The results reveal parent effortful control to be a protective-stabilizing variable (Luthar et al., 2000) in that high adolescent surgency was only associated with high cognitive appraisal in the context of high parent effortful control. These findings provide further support for the concept that the effects of temperament on adaptive or maladaptive outcomes must always be considered within the environmental context of the individual. When accompanied by exposure to a parent with high effortful control, the approach tendency characterized by temperamental surgency may allow adolescents to be more

open to alternate ways of thinking about emotion eliciting stimuli, thereby facilitating cognitive reappraisal as an emotion regulation strategy. Parent effortful control, then, may act as an external source of regulation that attenuates potential negative effects of surgency while allowing the positive aspects of approach tendencies to facilitate healthy development of emotion regulation. It is also possible that parent effortful control facilitates the adolescent's own effortful control as transmitted through modeling and/or parenting behaviors. This question of how parent effortful control acts as a powerful environmental context is addressed in more detail on page fifty.

4.6 - Interaction Effects of Adolescent Surgency and Parent Effortful Control on Suppression

The use of suppression and cognitive reappraisal as emotion regulation strategies are often considered conceptually as opposites, in that high use of one strategy should be associated with low use of the other, and studies usually find these two strategies to be negatively correlated (Gross, 2002). It follows, then, that if adolescent surgency is related to higher use of cognitive reappraisal, it might also be associated with lower use of suppression. Jaffe and colleagues (2010) found this relationship to hold true, but only in the context of perceived parental care. Specifically, the authors found that high temperament-based approach was negatively related to suppression only in the context of high perceived parental care, suggesting that the context of parental care might act as a protective factor against use of suppression in children with low temperament based-approach. The authors posit that the parenting environment is especially important to emotion regulation, suggesting that suppression use is likely to occur in children whose parenting environment does not support the learning of adaptive emotion regulation strategies. As such, suppression use may emerge as one of the limited options that children in poor caregiving environments are able to use in order to achieve regulation in support of behavior-related goals (Repetti et al., 2002). The current study also revealed a relationship between adolescent surgency and suppression use as moderated by the context of the parent, but the current study furthers extant research by showing that this relationship may work differently for boys than for girls.

For boys, the negative relationship between surgency and suppression was found only in the context of low parent effortful control (see Figure 8). Following the trend so far, high parent effortful control acts as a protective-stabilizing variable (Luthar et al., 2000), in that low

adolescent surgency only puts boys at risk for high levels of suppression in the context of low parent effortful control. For girls, the story diverts from the current trend of parent effortful control as being a protective-stabilizing variable. Girls with low surgency do not appear to differ in their use of suppression, regardless of their parent's level of effortful control. However, girls with high surgency use less suppression only in the context of high parent effortful control (see Figure 9). This effect of parent effortful control might be labeled as *protective but reactive* in that high parental effortful control presents girls with a distinct advantage, but only when adolescent surgency is also high (Luthar et al., 2000). The main difference between boys and girls appears to be that high surgency may allow girls to benefit more from parents with high effortful control, in terms of low use of suppression, whereas high parent effortful control is only stabilizing for boys. Boys with low surgency also appear to be more vulnerable than girls to parent context of low effortful control. These findings provide further support that temperament affects developmental outcomes only as a function of their environment, and the differential findings between girls and boys add another dimension to consider in that gender, as well as environment, affects the relationship of temperament and developmental outcomes. The next section further explores the concept of effortful control and reasons why parent effortful control may attenuate specific relationships between adolescents' temperament dimensions and aspects of their emotion regulatory system.

4.7 - Effortful Control

Effortful control may be defined as the ability to willfully inhibit, activate, or modulate dominant responses in attention, affect, and behavior for the purposes of planning, error detection, and integrating information relevant to selecting behavior in certain situations (Eisenberg et al., 2011; Rothbart et al., 2004). Of the three temperament dimensions identified by Rothbart and Derryberry (1981), effortful control is the one most subject to development across the lifespan with the most noticeable growth occurring during the preschool years (Eisenberg et al., 2011). Although it is difficult to separate the influence of biological factors from environmental influences, especially in a construct that shows marked development over time, robust findings from longitudinal studies have revealed effortful control to be relatively stable from early childhood into adolescence (Kochanska & Knaack, 2003; Kochanska, Coy, & Murray, 2001); thus, effortful control is considered to have a strong constitutional basis and is studied as a dimension of temperament. Effortful control has been strongly linked to the

development of a network of areas in the prefrontal cortex; thus, Rothbart and colleagues (2004) posit that many of the developmental changes in effortful control may be attributed to brain maturation.

Derryberry and Rothbart (1988) consider effortful control to be the regulatory aspect of temperament, and Eisenberg and colleagues (2011) emphasize the role of effortful control in the regulation of the reactive aspects of temperament, especially emotion regulation. Attentional processes may be directed to distract or distance oneself from emotion-eliciting stimuli but may also be helpful in using strategies like cognitive reappraisal. Inhibitory control may aid in the use of expressive suppression, whether for the purpose of concealing emotions or simply suppressing unwanted behavioral expression (such as physical aggression). Overall, the ability for planning and behavioral awareness associated with effortful control may aid in actively coping with emotional situations (Eisenberg et al., 2011). Effortful control is generally found to be negatively correlated with the more reactive temperamental dimensions of negative affect and surgency (Rothbart et al., 2004). Given the nature of effortful control in relation to emotion regulation, it is not surprising that the current study found adolescent effortful control to predict better emotion regulation, lower lability, and lower suppression use. A major contribution of the current study, however, are the findings related to parent effortful control as a moderator in the relationship between adolescent temperament dimensions and the emotion regulatory system.

With only one exception (being the relationship of girls' surgency as negatively related to suppression use), parent effortful control consistently acted as a protective-stabilizing factor in that the relationship of adolescent temperament with various aspects of their emotion regulatory system was attenuated in the context of high parent effortful control. Overall, the context of low parent effortful control allowed adolescent temperament to exert influence (often negative influence) on their emotion regulatory system. These findings provide support for the goodness-of-fit concept, which states that temperament should affect developmental outcomes only as a function of the environmental context. However, this begs the questions: how and why does parent effortful control act as such a powerful environmental context?

One of the simpler answers to this question is modeling. Children are exposed to their parents' interactions within the family and within social groups every day. Social modeling theory (Bandura, 1986) posits that children learn from parents vicariously (i.e., modeling). Extant research provides support for social learning theory, showing that many learned behaviors

in children can be traced to parent modeling. For example, anxiety disorders are often found to run in families. Although heritability does appear to play a large role in the development of anxiety disorders (behavioral genetic studies show that approximately one-third of etiological variance in anxiety disorders may be contributed to genetic factors; Eley, 2001; Jang, 2005), parental modeling may be a significant contributor as well (Fisak & Grills-Taquechel, 2007). There are a number of ways that parents can unintentionally model their anxiety related behavior to children. For example, parents may display physical signs of anxiety and may express their anxiety verbally, directly to the child or to others in the presence of the child. The coping mechanisms used by the parent to deal with anxiety are also observed by the child. The child may observe the parent using distraction or suppression to deal with the anxiety, or the parent may use more problem-based coping or even cognitive reappraisal. Regardless of the parent's reaction to anxiety and even in lieu of direct coaching from the parent, the child learns about anxiety and how to deal with it vicariously through the parent's actions (Fisak & Grills-Taquechel, 2007). In this same way, adolescents may learn from their parents' modeling of effortful control in a variety of situations. Applied to the results of the current study, parent effortful control may lead to successful modeling adaptive emotion regulatory strategies (i.e., cognitive reappraisal) over less adaptive strategies (i.e., suppression).

Another way that parent effortful control may act as an environmental context is through parenting. Belsky (1984) proposed that parenting is multiply determined and is strongly influenced by three main contextual forces. The first contextual force is parent characteristics and psychological resources (including temperament/personality factors), the second force being child characteristics (also temperament/personality factors), and the third being the broader social context of the parent-child relationship (i.e., marital relationship, social networks, education, etc.). Belsky also suggests that these factors do not necessarily have equal influence on parenting outcomes, but that a weakness in one area may be compensated for by strengths in the other two; thus, the system is "buffered." However, if more than one area is compromised, Belsky posits that the parent characteristics will be the most influential in determining optimal outcomes. In examining literature on positive parenting practices, it can be seen that effortful control may be considered an important factor in successful parenting. For example, children are

more likely to develop good self-esteem, self-control, and social competence if their parents use reasoning, consistent discipline, and display expressive warmth (Kiff, Lengua, & Zalewski, 2011).

Indeed, Belsky (1984) notes that if one must choose a central theme or “core” of parenting that provides the most optimal outcomes, parenting that is sensitive and attuned to the needs and capabilities of the child will promote the best developmental outcomes. Research on the goodness-of-fit model emphasizes that developmental outcomes often depend upon how well the child “fits” into existing family patterns and expectations (Gordon, 1981; Kopp & Neufeld, 2003). A child that “fits” or meets their parents’ needs is more likely to receive social and emotional resources from the parent (Radke-Yarrow & Sherman, 1990). However, a parent who is able to identify and understand the needs of the child may be able to provide a more optimal environment for a child who may or may not fit with the needs of the parent. Effortful control, especially the component of attentional regulation, is strongly related to the ability to empathize with others (Eisenberg et al., 2011; Rothbart et al., 1994). Thus, it may be that parents who have strong effortful control are better able to empathize with their children and tailor their parenting practices to meet their child’s needs rather than expecting the child to fit into pre-existing expectations and familial practices.

Another important component of parenting that may be related to effortful control is parents’ reactions to children’s emotions. Eisenberg and colleagues (2011) emphasize that appropriate responses to children’s emotions may be crucial in teaching effective strategies of emotion regulation. Appropriate responses from parents require good effortful control and have been directly linked with children’s own effortful control, suggesting that socialization of emotion may be one way in which effortful control is transmitted intergenerationally. High levels of positive parent responses (e.g., validating emotions, encouraging expression, problem and emotion focused responses) and low levels negative responses (e.g., suppressing and minimizing distress reactions, low punishment) are associated with high effortful control in children (Valiente, Lemery-Chalfant, & Reiser, 2007). Valiente and colleagues also found that parents with greater effortful control were more likely to give positive responses over negative responses to their children’s emotions.

Given the strong negative correlation between effortful control and negative affect established in extant literature, it was surprising that parent effortful control did not moderate the relationship between adolescent negative affect and emotion regulation. Extant literature suggests that children high in negative affect may have more difficulty regulating their emotions because of low effortful control, and low effortful control has been found to be more strongly related to problem behavior in children who are also high in negative emotions (Eisenberg et al., 2011). As such, it was hypothesized that parent effortful control might compensate for high adolescent negative affect, but this was not found to be the case. A possible explanation is that, with the exception of boys' lability (see Figure 6), parent effortful control acted as a moderating variable in relation to specific strategies of emotion regulation (i.e., suppression and cognitive reappraisal), rather than being related directly to general emotion regulation ability. Adolescent negative affect was only found to be related to emotion regulation ability (and only for girls). Thus, it may be that parent effortful control is more likely to act as a protective-stabilizing factor in relation to *strategies* of emotion regulation rather than emotion regulation *ability*. A direction for future research should be to examine whether other parent factors may act as protective factors against possible adverse effects of high temperamental negative affectivity in girls.

4.8 - Caveats and Questions for Further Research

Gender differences. A number of gender differences were found with respect to the study hypotheses, although gender difference testing was largely exploratory, as I did not have specific hypotheses as to the direction of gender effects. The few studies examining interactions of parent and adolescent temperament have found both adolescent and parent gender differences with regards to parent-adolescent temperament interactions (e.g., Galambos & Turner, 1999; Kawaguchi et al., 1998; Rettew et al., 2006). For example, Galambos and Turner (1999) found that high activity level in girls was associated with higher parent conflict when mothers were low in adaptability, whereas conflict was higher for boys with low activity level. Similar parent/adolescent dyad differences were found for fathers. Higher conflict was associated with fathers and daughters who were both low in adaptability but no such relationship was found for fathers and sons. These findings indicate that in order to understand the effects of interactions of parent and adolescent temperament, the gender of the parent must also be taken into account. As the majority of the parents in the current sample were mothers (90%), I was not able to examine gender/dyad effects. It is possible that the differential outcomes of boys and girls with regards to

the emotional regulatory system might look different if the influence of fathers was also considered. Given that ninety percent of the parents in the current sample were mothers, the results of the current study should be interpreted as mainly the effects of mother and adolescent temperament interactions on the emotion regulatory system. A direction for future research, then, may first be to examine possible differences in the effects of interactions of parent and adolescent temperament on the emotion regulatory system between mothers and fathers. Then, if differences in parent/adolescent gender dyads are confirmed the next step would be to examine why such differences exist.

Although there is a lack of studies exploring why such parent/adolescent gender differences may exist, a few researchers have offered speculation as to why these differences may exist. Galambos and Turner (1999) suggest that the gender may be considered an aspect of the social context that must be considered when determining a “goodness-of-fit” between adolescent temperament and the environment. This may be, in part, due to cultural expectations and sex stereotypes (e.g., “boys will be boys” or expecting girls to be more docile). Kawaguchi and colleagues (1998) posit that gender differences may be due to greater identification and/or empathy within a same sex dyad. For example, fathers might be more tolerant of certain behaviors in sons than daughters, perhaps because of gender stereotypes but also because the father may empathize more with a son’s behavior if their son reminds them of their own childhood behaviors. Similarly, a mother may identify more with a daughter’s behavior for similar reasons. Additionally, Kawaguchi and colleagues suggest that the same sex parent may act as a better role model. Boys may benefit more from modeling from their fathers and girls may benefit more from modeling from their mothers due to greater identification with the same sex parent. A speculation of gender differences based on the findings of the current study is in regards to needs for different types of support. As mentioned previously, girls appear to benefit more from emotional support whereas boys are more likely to benefit from instrumental support (Piko, 2011). Extant research also shows that mothers are more likely to give emotional support, whereas fathers are more likely to give instrumental support (Marks & McLanahan, 1993). Therefore, mothers may be more likely to meet the support needs of girls, resulting in more adaptive outcomes for girls, whereas fathers may be more likely to meet the support needs of boys, again resulting in more adaptive outcomes for boys.

Adolescent individuation. Extant literature shows adolescence to be a critical developmental period in many ways. Adolescents' experience drastic physiological and neurological changes as well as changes to their social networks and even family interactions (Nelson et al., 2005; Spear, 2000). Early adolescence marks a time when children begin to individuate themselves from their parents. They spend more time with peers and begin to actively forge identities that they perceive as different from their parents (Koepke & Denissen, 2012). It is important to consider this individuation process, especially when relying on self-report measures. In the current sample, with the exception of parent negative affect and adolescent effortful control, adolescent and parent temperament dimensions are uncorrelated (see Table 1). To my knowledge, this is the first study to compare self-report parent and adolescent temperament using Rothbart and Derryberry's (1981) temperament measures. Given the possibility of genetic influences and family similarities, one might expect parent and adolescent temperament to be more similar. However, Rothbart and Derryberry's temperament measure assesses temperament via questions about behavior in various contexts. It is possible that adolescents may respond questions about their behavior in ways that they perceive will differentiate them from their parents. In other words, when asked if they are usually a certain way in a specific situation, their responses may reflect their awareness of trying to be different from their parents. The individuation process is important to consider because adolescents' attempts to individuate themselves from their parents may put them at high risk for a poor fit of environment. Parents may perceive their adolescent's individuation as disruptive and may not always respond well. Thus, it may be especially important to understand the impact of interactions of parent and adolescent temperament during this developmental period.

Adaptive versus maladaptive emotion regulation. In general, extant literature concludes that cognitive reappraisal is a more adaptive regulation strategy than suppression (Gross & John, 2003). Indeed, the main hypotheses of this study were founded on this assumption. However, emerging literature shows that understanding emotion regulation strategies may require a more nuanced approach than categorizing strategies as always adaptive or always maladaptive. Thus, for the current study, when interpreting results to show that parent effortful control acts as a protective-stabilizing factor, it should be noted that suppression may not always be maladaptive nor cognitive reappraisal always adaptive as specific strategies for emotion regulation. If this is the case, then further research may be necessary to fully understand

how parent effortful control may act as a protective factor for the adolescent emotion regulatory system. The following section provides a more detailed review of literature supporting the conclusion that reappraisal is adaptive and suppression is maladaptive and concludes with a look at nascent research that challenges this dichotomy.

Cognitive reappraisal and suppression are two of the most often studied emotion regulation strategies. Cognitive reappraisal is the process of altering one's emotional state by changing the way one thinks about the emotion eliciting situation, thereby resulting in a "cognitive transformation of emotional experience" (Ochsner et al. 2002, p. 1215). Cognitive reappraisal is generally considered an antecedent-focused strategy; that is, the effort applied to altering emotion occurs before "response tendencies have become fully activated and have changed our behavior and our peripheral physiological responding" (John & Gross, 2004, p. 1303). An individual may "reappraise" an event in unemotional terms, or they may try to find ways of looking at a negative event in a positive light. For example, in the event of getting a bad grade on a test, a person can choose to think about the grade not as a reflection of their intelligence but simply as a prompt to study more or to find better ways of studying in the future. The person can also look at this event as an impetus to improve their study skills and rise to a challenge, thus, framing a potentially anxiety inducing event in a positive light.

Suppression is the process of trying to reduce outward expression of emotions through facial or bodily reactions. Suppression can occur on several levels. For example, if someone makes you angry, you can suppress the impulse to punch them in the face while still expressing your anger verbally or through non-verbal gestures, but you can also suppress all expression of the emotion in an effort to maintain an outward show of calm. Suppression is considered a response-focused strategy because physiological and behavioral response tendencies have already been elicited, and you are simply trying to suppress the outward expression or behavioral response of the emotion (John & Gross, 2004). In the case of the example of getting a bad grade on a test, the person using suppression as an emotion regulation strategy would try not to cry or show distress on their face and interact with others as if nothing was bothering them. It is important to note that suppression as a regulation strategy does not necessarily alter the experience of the emotion, merely the expression of emotion, whereas cognitive reappraisal focuses on altering experience of the emotion (John & Gross, 2004).

Thus, the concepts of suppression and cognitive reappraisal actually mean different things in terms of the broader concept of emotion regulation. Although successful use of both strategies may result in regulation of behavior elicited by emotional states, only the use of cognitive reappraisal results in the regulation of emotion itself. Emotion regulation is generally defined as the ability to exercise control over one's emotional states for the purposes of goal attainment (Eisenberg et al., 2000). Under this definition, both reappraisal and suppression uses can be good emotion regulators if their goals are behavioral or relational in nature. However, if the goal is to actually modulate intensity, frequency, or duration of emotional states, the suppression as an emotional regulation strategy cannot aid in achieving this goal. Gross and Levinson (1997) did find that suppression may be successful in decreasing experience of positive emotion, but not negative emotion. However, reduction of experience of positive emotions, in most situations, is not necessarily a desirable outcome, whereas modulation of experience of negative emotions may be more relevant to preventing negative outcomes, such as chronic internalizing and externalizing symptomatology.

Whether for good or ill, cognitive reappraisal and suppression have differential effects in physiological, neurological, cognitive, and social domains (e.g., Goldin et al., 2008; Gross, 2002; Richards & Gross, 2000). When used to down-regulate experience of an emotional state, cognitive reappraisal is associated with decreased autonomic arousal and cardiovascular activity. Suppression, in contrast, may decrease expression of emotion, but actually increases sympathetic arousal of the cardiovascular system (Gross, 2002). Thus, suppression of emotion expression, paradoxically, has the potential to make it more difficult to do so by increasing physiological arousal. Goldin and colleagues (2008) examined neurological effects of emotion regulation strategies and found that use of cognitive reappraisal to down-regulate emotions is related to early responses in the prefrontal cortex and decreased activity in the amygdala and insular responses. In contrast, suppression was found to be associated with late prefrontal cortex response and increased amygdala and insular responses. Extant literature also establishes that use of suppression exacts higher cognitive costs than does use of reappraisal. Richards and Gross (2000) posit that suppression should require more cognitive resources, as suppression must be maintained through the course of an emotion-eliciting situation, whereas reappraisal should require few cognitive resources, as it alters "emotional reality" early on in the situation and does

not require maintenance or active inhibition of an elicited emotion. Richards and Gross (2000) found support for their hypothesis in that use of suppression impaired memory for verbal encoding, as well as memory of the emotion-eliciting event.

Strategies of emotion regulation also have implications for social functioning and general well-being. Users of cognitive reappraisal are more likely to share both positive and negative emotions with others, but are able to do so without directing emotion-expressive behavior towards others. As a result, friends of reappraisers are more likely to view the relationship as closer and more meaningful, and reappraisers are better liked by their peers than suppressors (Gross & John, 2003). Suppressors are less likely to share both negative and positive emotions and report discomfort with closeness in relationships. In terms of general well-being, habitual use of reappraisal can lead to enhanced control of emotions, lower rates of depression, and a greater sense of well-being. In contrast, habitual use of suppression is associated with higher depression, lower self-esteem, and a low sense of well-being (Gross & John, 2003). It is clear that extant literature shows a plethora of benefits of using cognitive reappraisal and a number of detrimental costs to using suppression as an emotion regulation strategy. However, some emerging research questions the absolute dichotomy of this conclusion.

First of all, a distinction should be made between emotion regulation *strategy* and *style*. Cognitive reappraisal and suppression as emotion regulation *strategies* implies the ability to use one or the other as a way of regulating emotion in specific situations. In this they are not necessarily mutually exclusive; a person may use both cognitive reappraisal and suppression as strategies of emotion regulation in different circumstances. Cognitive reappraisal and suppression as emotion regulation *styles* carries a different connotation. An emotion regulation style implies a pervading tendency to use one strategy over another. Many studies on emotion regulation use styles and strategies as interchanging and do not consider the possibility that although suppression appears to have great cost in many domains that may make it maladaptive as a style of emotion regulation, it is possible that suppression might still be a useful strategy in certain situations. Equally important to consider is the idea that cognitive reappraisal might appear to be adaptive as a style of emotion regulation due to low costs, but it may not be adaptive in all situations.

Cognitive reappraisal and suppression, as measured by the ERQ in the current study, are conceptualized more as mutually exclusive styles than as individual strategies. Although the measure does allow for an individual to rate high or low on both cognitive reappraisal and suppression, such cases are often flagged as statistical anomalies. One such case was removed from analyses of the current study as a statistical outlier. Unfortunately, the way the measure is devised, there is no way to ascertain if the participant was not paying attention to the survey or if they were indeed identifying with cognitive reappraisal and suppression as different strategies that they use in different situations. As such, finding more nuanced ways of measuring emotion regulation styles and strategies may be necessary to advancing research in the field of emotion regulation. With regards to the current study, interpretation of parent effortful control as a protective-stabilizing factor should be considered only when viewing cognitive reappraisal and suppression as emotion regulation styles. Parent effortful control may act differently with regards to cognitive reappraisal and suppression when considered as individual strategies. It is possible that a better way of looking at adaptive versus maladaptive emotion regulation may be to examine the adolescent's ability to choose appropriate strategies for different emotion eliciting situations. Indeed, Westphal, Seivert, and Bonanno (2010) propose that expressive flexibility, or having the ability to choose among various resources and means of expressing and experiencing emotions, may be more predictive of well-being than any use of one strategy over another.

It is possible, then, that the adaptiveness or maladaptiveness of a specific strategy may depend more upon the appropriateness of the strategy in relation to the context of the emotion-eliciting event than the tendency to use any one strategy over another. This brings us back to the definition of emotion regulation that states it is for the purposes of "goal attainment." It may not always be adaptive for the goal to be complete reduction of negative emotion, and despite the costs of suppression, there may be situations in which it is necessary. Perhaps suppression may be useful in situations where reappraisal fails or is not possible. For example, if a friend tells you that they have been having suicidal thoughts, feelings of surprise, dismay, sadness, and anxiety are all appropriate feelings, and there aren't many ways that you could construe such a revelation to attenuate those feelings. However, the ability to suppress overt displays of these emotions may go a long way in earning your friend's trust and making them feel comfortable sharing thoughts and feelings that they desperately need to discuss.

Just as suppression may not always be maladaptive, Troy, Shallcross, and Mauss (in press) posit that there are often situations in which cognitive reappraisal is not always adaptive. For example, there is a difference between getting laid off due to company failure and getting fired for being lazy. Reappraisal in the first situation may help the person see an uncontrollable situation in a more positive light (i.e., not their fault, or opening new opportunities), but reappraisal in the second situation may lead to a lack of appropriate changes made to one's work ethic. Abusive relationships are another circumstance in which reappraisal could be maladaptive. The abused person may console themselves by making excuses for their partner. This kind of reappraisal may alter negative emotions towards the situation but it also increases the chances that the person will not seek to end the abusive relationship. Thus, it is clear that some situations are best dealt with via emotion-based coping- changing one's own feelings- and other situations via problem-based coping- changing one's circumstances (Schaffer, 2012). It may be that any one coping strategy is adaptive or maladaptive in and of itself. Schaffer (2012) suggests that the ability to choose among different strategies on demand in everyday situations may be more predictive of well-being than preference for any one emotion regulation strategy. Thus, a direction for future research would be to see if the function of parent effortful control as a protective-stabilizing factor holds true for adolescents' expressive flexibility.

Parent temperament as a context for adolescent temperament. The major premise of the current study is based on assertions in extant research that parent temperament may be considered an important context for adolescents' development. However, it might be argued that parent temperament is too distal a factor to be either a major predictor of adolescent adjustment or of use in understanding adaptive and maladaptive outcomes in adolescence. Belsky (1989) argues that parent temperament is a major determinant of parenting. Indeed, the possible influence of parent temperament on parenting behavior was discussed as an explanation for the results of this study. It may seem, then, that parenting behavior may be a more proximal, and therefore more important, influence on adolescent adjustment. However, understanding the influence of parent temperament may help to identify adolescents who are at risk for maladaptive outcomes- the results of this study being specifically in regards to outcomes in emotion regulation.

If parenting behaviors are indeed a more proximal factor in regards to adolescent outcomes, a direction for future research, then, is to explore possible pathways and mechanisms by which parent temperament, in interaction with adolescent temperament, influences outcomes. For example, I have speculated that parent effortful control may be a powerful protective-stabilizing factor because having high effortful control allows parents to better empathize with their adolescences. I also suggested that parents with high effortful control may be more likely to have more positive responses to their children's emotions. Understanding mechanisms by which parent temperament influences outcomes may help inform family interventions. First, understanding what parent temperament dimensions may put adolescents at greater risk (e.g., low effortful control) can help to identify at-risk families. Then, interventions can focus on improving specific mechanisms such as empathy or emotion socialization. In sum, though parent temperament may be more distal than other factors of influence on adolescent outcomes, research on parent temperament may still be important and useful.

4.9 - Limitations

A few limitations of the current study merit discussion. First, the study does not address the possibility of genetic influence in developmental outcomes. Thus, the influence of parent factors on the adolescent emotion regulation may be, at least in part, due to genetic influences. Extant literature does support at least a partial genetic basis for emotion regulation ability (Canli, Ferri, & Duman, 2009; Hariri & Holmes, 2006); however, the effects of environmental influences cannot be discounted. Additionally, Rettew and colleagues (2006) assert that even in a design that does not account for genetic influence, if genetic risk was a major influence on developmental outcomes, then it would be more likely that this would be detected in main effects of parent and child temperament on outcomes, rather than in interactions. Nevertheless, an ideal experimental design would be an adoption or twins study that allows for independent assessment of genetic and environmental influences (Rutter et al., 1997).

Another limitation is that, as previously mentioned, I was not able to examine the possibility of differential effects of mothers and fathers in relation to boys' and girls' outcomes. As such, the reasons for gender differences among the relationships of parent-adolescent temperament and the emotion regulatory system are still unclear. A direction for future research may be to more closely examine parent/adolescent dyads of same and opposite sex in order to better understand how parent and adolescent gender may affect adolescent outcomes. Finally, the

data for the current study are cross-sectional; therefore, no assumptions can be made about causality among the study variables. Future research may benefit from longitudinal designs that would allow for the observation of the development of the emotion regulatory system over time in order to study dynamic relations between adolescent and parent temperament and emotion regulation system.

4.10 - Conclusions

Overall, the results of the current study provided support for the hypothesis that parent and adolescent temperament may interact to predict outcomes in the adolescent emotion regulatory system. Parent temperament was shown to function as an important environmental context for adolescent outcomes. Parent effortful control, in particular, was shown to be an important protective-stabilizing factor for adolescents who might otherwise be at risk for poor outcomes in the emotion regulatory system. Results of this study also support the goodness-of-fit hypothesis, in that the effects of adolescent temperament on developmental outcomes may be dependent upon the environmental context of parent temperament. These findings have several important implications for interventions for facilitating healthy development of the emotion regulation system in adolescents. First, adolescents may be at greater risk for poor emotion regulation if their temperament is not a good fit with their parents' temperament. Results of this study shed light on which temperament traits and what environmental context (specifically, low parent effortful control) may put adolescents at higher risk.

These findings can help inform parenting interventions that focus on helping parents understand their child's temperament. Evidence from such interventions show that children whose parents have individualized feedback about their child's temperament have fewer problem behaviors, lower rates of obesity, and lower anxiety than children whose parents did not receive feedback (Cameron & Neville, 2008). Sanson and colleagues (2011) suggest that parents can learn to increase the goodness-of-fit through *scaffolding* and *stretching*. Scaffolding refers to protecting children from potentially overwhelming and aversive circumstances that may be detrimental to positive outcomes. Stretching refers to exposing children to circumstances which facilitate development of internal regulatory capacities by allowing them to practice regulation in a supportive environment. The current study may serve to further these kinds of interventions by helping parents understand how their own temperamental tendencies may influence the goodness-of-fit of their adolescent's environment.

Finally, in such cases where parenting interventions are not possible, these results may inform interventions that target improving adolescent emotion regulation and teaching adaptive strategies of emotion regulation. If improving the goodness-of-fit of the adolescent's environment via parental intervention is not possible, then it may be helpful for adolescents to understand how their own individual differences and temperament affects how they feel and their ability to alter their emotions. Education on emotions and emotion regulation may even be beneficial as a preventative program for pre-adolescents to prepare them for the changes they will experience in frequency and intensity of emotions as they progress through puberty and enter adolescence.

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Table 1

Correlations among study variables and covariate

	Income	PEC	PNA	AEC	ANA	AS	Areap	Asupp	Aer	Alab
Income										
PEC	.221**									
PNA	-.041	-.520**								
AEC	.219**	-.065	.162*							
ANA	-.069	-.003	.017	-.417**						
AS	.119	-.010	-.092	.091	-.285**					
Areap	-.009	.060	-.019	.171*	-.180*	.035				
Asupp	-.128	-.057	.043	-.192*	.145	-.247**	.038			
Aer	.113	.003	-.040	.342**	-.155	.095	.291**	-.450**		
Alab	-.115	.058	-.036	-.420**	.687**	-.166*	-.127	.065	-.024	
M		4.619	3.965	3.452	2.530	3.230	4.931	3.781	3.134	2.059
SD		.762	.673	.540	.565	.664	.941	1.171	.368	.430
N	157	157	157	157	157	157	157	157	157	157

PEC = Parent Effortful Control; PNA = Parent Negative Affect; AEC = Adolescent Effortful Control;
ANA = Adolescent Negative Affect; AS = Adolescent Surgency; Areap = Adolescent Cognitive Reappraisal;
Asupp = Adolescent Suppression; Aer = Adolescent Emotion Regulation; Alab = Adolescent Emotion Liability

Table 2

Parameter estimates for main and interaction effects

	DV = Emotion Regulation			DV = Emotion Lability			DV = Cognitive Reappraisal			DV = Suppression		
	Estimate	Std. Error	<i>p</i>	Estimate	Std. Error	<i>p</i>	Estimate	Std. Error	<i>p</i>	Estimate	Std. Error	<i>p</i>
<i>Model 1</i>												
Adolescent Negative Affect (ANA)	-.005/-.242	.069/.074	.942/.001	.564	.049	.001	-.344	.137	.012	.003	.133	.982
Parent Negative Affect (PNA)	-.066/.071	.055/.052	.229/.174	-.036	.037	.331	-.065	.103	.529	.003	.133	.982
Interaction PNAXANA	.067	.085	.428	.051	.080	.519	.041	.220	.851	-.288	.286	.313
<i>Model 2</i>												
Adolescent Negative Affect (ANA)	-.003/-.237	.069/.075	.967/.002	.561	.050	.001	-.326	.136	.017	.396	.180	.028
Parent Effortful Control (PEC)	.004	.035	.916	.020	.033	.550	.110	.090	.224	-.056	.120	.638
Interaction PECxANA	-.059	.078	.448	.008	.072	.913	.168	.198	.397	-.050	.261	.849
<i>Model 3</i>												
Adolescent Effortful Control (AEC)	.212	.052	.001	-.349	.059	.001	.227	.137	.098	-.348	.179	.050
Parent Effortful Control (PEC)	.015	.035	.665	-.005	.041	.910	.117	.094	.210	-.139	.125	.265
Interaction PECxAEC	-.053	.070	.453	.086	.080	.283	-.109	.186	.558	-.066/.816	.344/.303	-.847/.007
<i>Model 4</i>												
Adolescent Surgency (AS)	.031	.042	.467	-.074	.051	.150	.183	.106	.083	-.514	.137	.001
Parent Effortful Control (PEC)	.015	.036	.672	.021	.043	.629	.124	.090	.169	-.172	.116	.138
Interaction ASxPEC	.084	.057	.142	-.196/.108	.120/.080	.103/.177	-.239	.143	.094	.703/-.491	.297/.203	.018/.016

Paths were constrained to be equal for boys and girls except where indicated by two estimates given. Boys are on the left and girls are on the right.

Table 3

<i>Model 1 fit comparisons for two group model comparing path constraints between boys and girls</i>						$\Delta\chi^2$	ν	p	Path allowed to vary freely in final model
Default (all paths free)	6.699	6	.350	.994	.028				
ANA \rightarrow Aer	15.943	7	.026	.923	.093	9.244	1	.002	*
ANA \rightarrow Alab	7.753	7	.355	.994	.027	1.054	1	.305	
ANA \rightarrow Asupp	8.654	8	.372	.994	.024	1.955	2	.376	
ANA \rightarrow Areap	11.750	9	.228	.976	.046	5.051	3	.168	
PNA \rightarrow Aer	16.089	10	.037	.948	.064	9.390	4	.050	*
PNA \rightarrow Alab	11.812	10	.298	.984	.035	5.113	4	.276	
PNA \rightarrow Asupp	11.812	11	.378	.993	.022	5.113	5	.402	
PNA \rightarrow Areap	14.881	12	.248	.975	.040	8.182	6	.225	
Interaction \rightarrow Aer	17.714	13	.169	.960	.050	11.016	7	.138	
Interaction \rightarrow Alab	18.166	14	.199	.964	.045	11.467	8	.177	
Interaction \rightarrow Asupp	18.278	15	.248	.974	.039	11.579	9	.238	
Interaction \rightarrow Areap	18.291	16	.307	.980	.031	11.592	10	.313	
Final Model	18.291	16	.307	.980	.031				

Table 4

Model 2 fit comparisons for two group model comparing path constraints between boys and girls

Paths constrained to be equal: boys/girls	χ^2	df	<i>p</i>	CFI	RMSEA	Wald Test $\Delta\chi^2$	Δ df	Δp	Path allowed to vary freely in final model
Default (all paths free)	7.196	6	.303	.990	.037				
ANA → Aer	16.386	7	.022	.925	.096	9.190	1	.002	*
ANA → Alab	8.530	7	.288	.988	.039	1.334	1	.248	
ANA → Asupp	9.458	8	.305	.988	.035	2.262	2	.323	
ANA → Areap	12.427	9	.190	.973	.051	5.231	3	.156	
PEC → Aer	13.057	10	.221	.975	.046	5.861	4	.210	
PEC → Alab	15.596	11	.157	.963	.053	8.400	5	.136	
PEC → Asupp	16.034	12	.190	.968	.048	8.838	6	.183	
PEC → Areap	17.485	13	.178	.964	.048	10.289	7	.173	
Interaction → Aer	17.711	14	.220	.970	.042	10.515	8	.231	
Interaction → Aer	18.034	15	.261	.976	.037	10.838	9	.287	
Interaction → Aer	18.639	16	.288	.979	.033	11.443	10	.324	
Interaction → Aer	19.241	17	.315	.982	.030	12.045	11	.360	
Final Model	19.241	17	.315	.982	.030				

Table 5

Model 3 fit comparisons for two group model comparing path constraints between boys and girls

Paths constrained to be equal: boys/girls	χ^2	df	p	CFI	RMSEA	Wald Test $\Delta\chi^2$	Δ df	Δp	Path allowed to vary freely in final model
Default (all paths free)	3.827	6	.700	1.000	.000				
AEC \rightarrow Aer	4.924	7	.669	1.000	.000	1.097	1	.295	
AEC \rightarrow Alab	7.496	8	.484	1.000	.000	3.670	2	.160	
AEC \rightarrow Asupp	8.399	9	.494	1.000	.000	4.573	3	.206	
AEC \rightarrow Areap	8.704	10	.560	1.000	.000	4.877	4	.300	
PEC \rightarrow Aer	8.907	11	.630	1.000	.000	5.081	5	.406	
PEC \rightarrow Alab	8.908	12	.711	1.000	.000	5.081	6	.533	
PEC \rightarrow Asupp	9.143	13	.762	1.000	.000	5.316	7	.621	
PEC \rightarrow Areap	9.689	14	.785	1.000	.000	5.862	8	.663	
Interaction \rightarrow Aer	9.963	15	.822	1.000	.000	6.136	9	.726	
Interaction \rightarrow Alab	11.523	16	.776	1.000	.000	7.697	10	.658	
Interaction \rightarrow Asupp	15.437	17	.564	1.000	.000	3.745	11	.053	*
Interaction \rightarrow Areap	11.613	17	.823	1.000	.000	7.786	11	.732	
Final Model	11.613	17	.823	1.000	.000				

Table 6

Model 4 fit comparisons for two group model comparing path constraints between boys and girls

Paths constrained to be equal: boys/girls	χ^2	df	<i>p</i>	CFI	RMSEA	Wald Test $\Delta\chi^2$	Δ df	Δp	Path allowed to vary freely in final model
Default (all paths free)	8.006	6	.238	.966	.048				
AS → Aer	9.582	7	.214	.956	.050	1.576	1	.209	
AS → Alab	10.052	8	.261	.980	.042	2.047	2	.359	
AS → Asupp	10.205	9	.334	.994	.030	2.200	3	.532	
AS → Areap	10.336	10	.412	1.000	.015	2.330	4	.675	
PEC → Aer	10.509	11	.485	1.000	.000	2.503	5	.776	
PEC → Alab	10.977	12	.531	1.000	.000	2.971	6	.812	
PEC → Asupp	11.116	13	.601	1.000	.000	3.111	7	.875	
PEC → Areap	12.462	14	.569	1.000	.000	4.456	8	.814	
Interaction → Aer	12.885	15	.611	.991	.000	4.879	9	.845	
Interaction → Alab	16.558	16	.415	.894	.015	3.832	10	.050	*
Interaction → Asupp	22.297	16	.134	1.000	.052	9.438	10	.002	*
Interaction → Areap	13.930	16	.604	1.000	.000	5.924	10	.822	
Final Model	13.930	16	.604	1.000	.000				

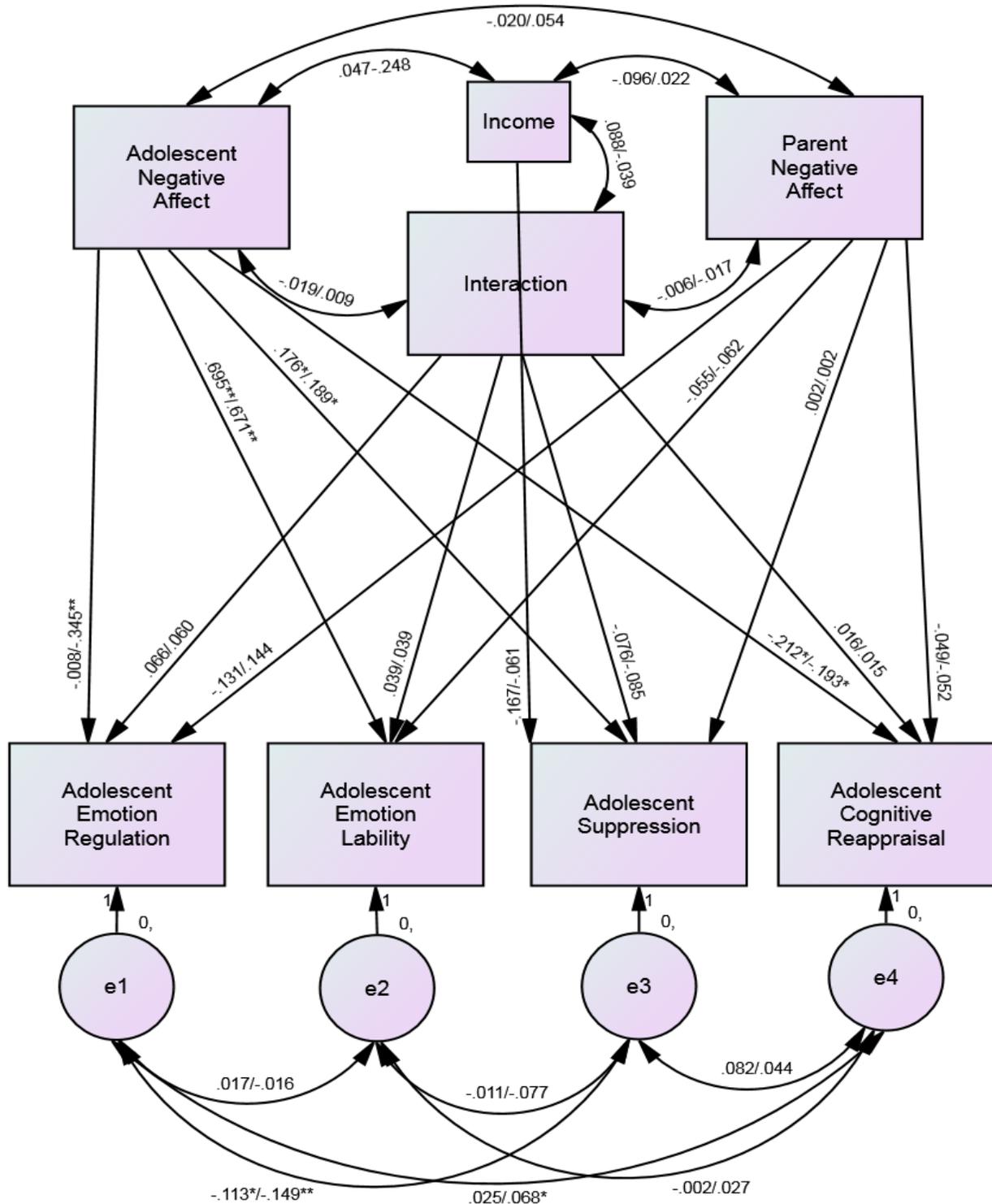


Figure 1. Model 1: Associations of adolescent negative affect and parent negative affect on the emotion regulatory system. Standardized parameter estimates are shown with males on the left and females on the right. * $p < .05$, ** $p < .001$.

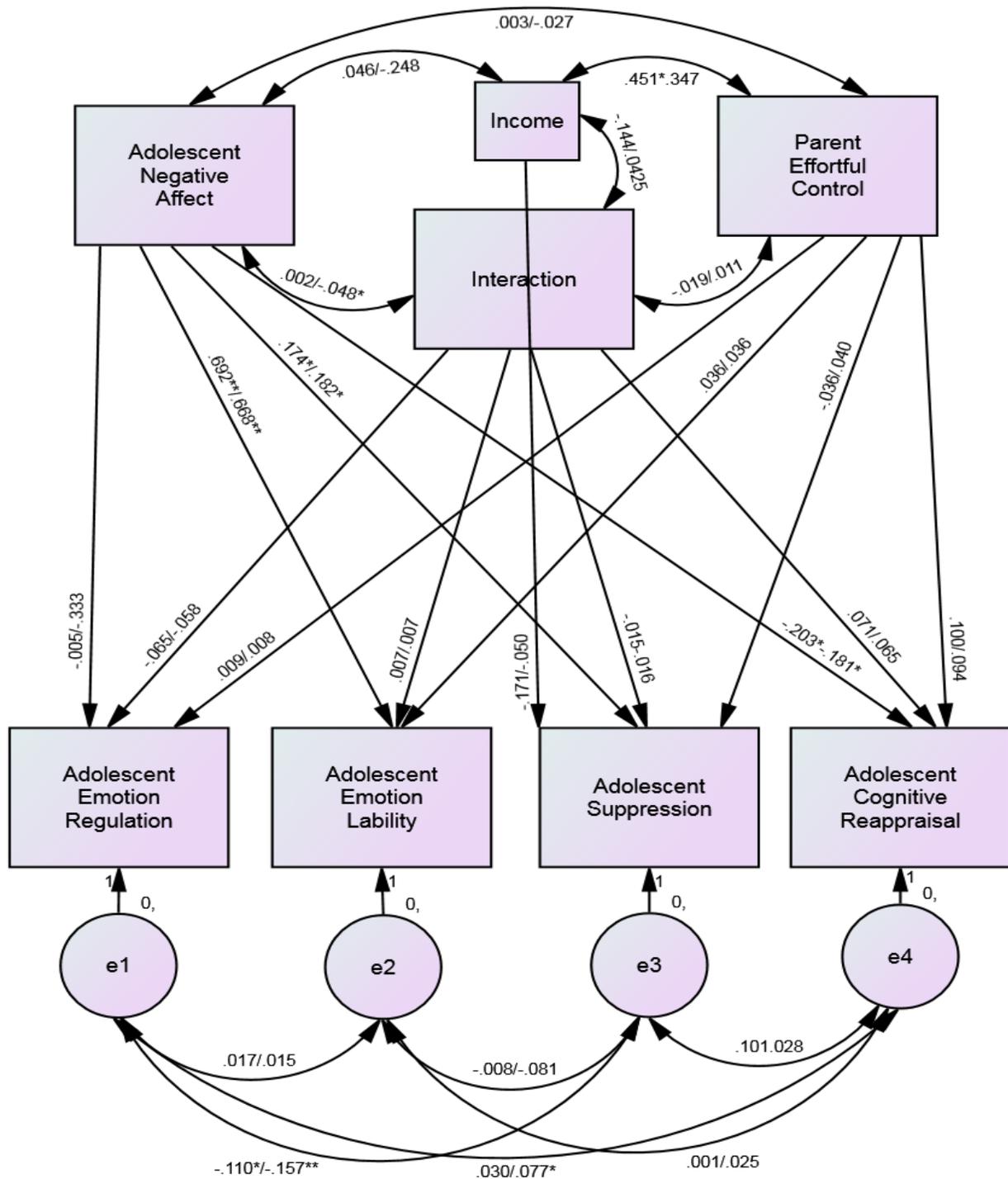


Figure 2. Model 2: Associations of adolescent negative affect and parent effortful control on the emotion regulatory system. Standardized parameter estimates are shown with males on the left and females on the right. * $p < .05$, ** $p < .001$.

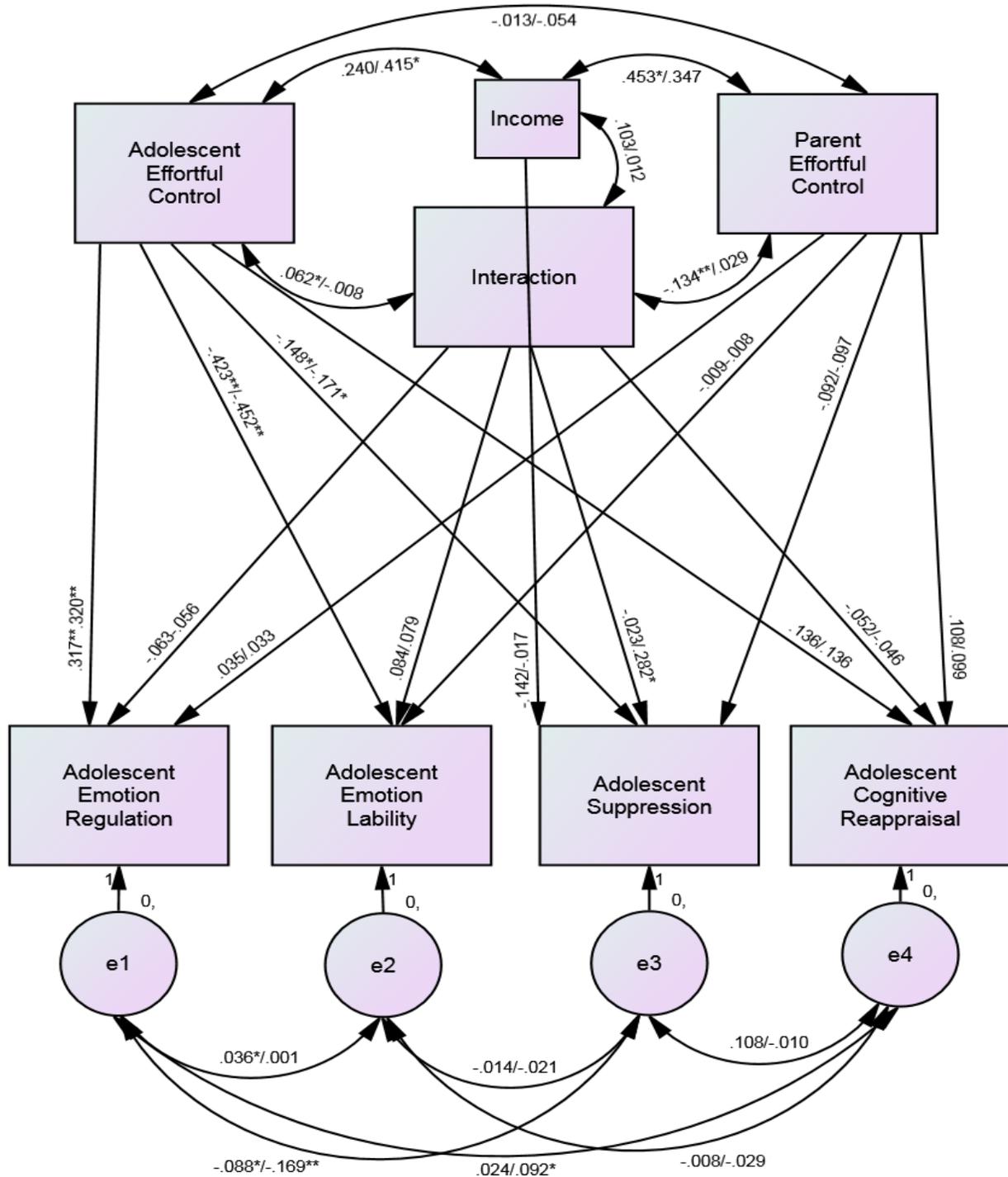


Figure 3. Model 3: Associations of adolescent effortful control and parent effortful control on the emotion regulatory system. Standardized parameter estimates are shown with males on the left and females on the right. * $p < .05$, ** $p < .001$.

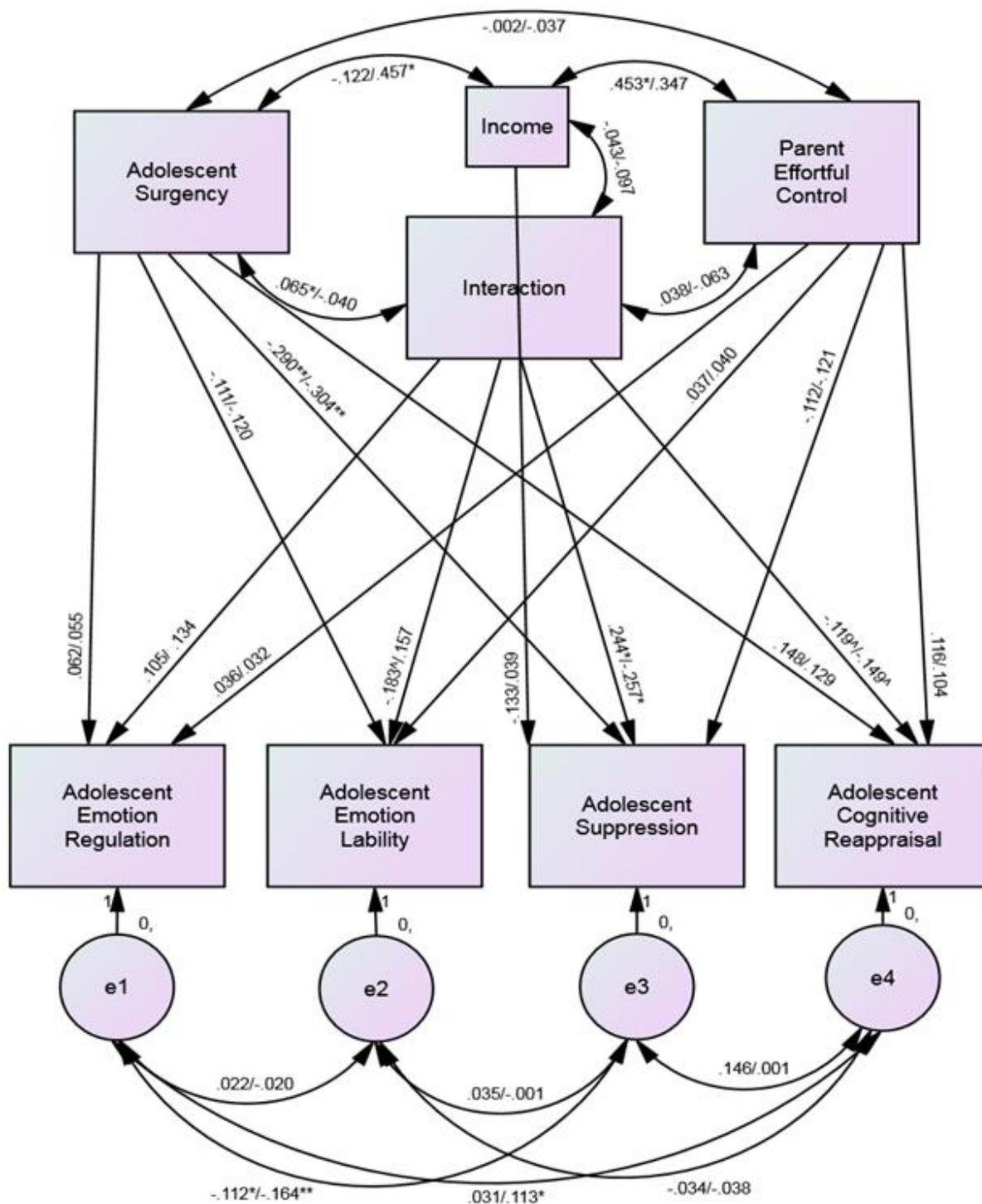


Figure 4. Model 4: Associations of adolescent surgency and parent effortful control on the emotion regulatory system. Standardized parameter estimates are shown with males on the left and females on the right. $^{\wedge}p < .10$, $*p < .05$, $**p < .001$.

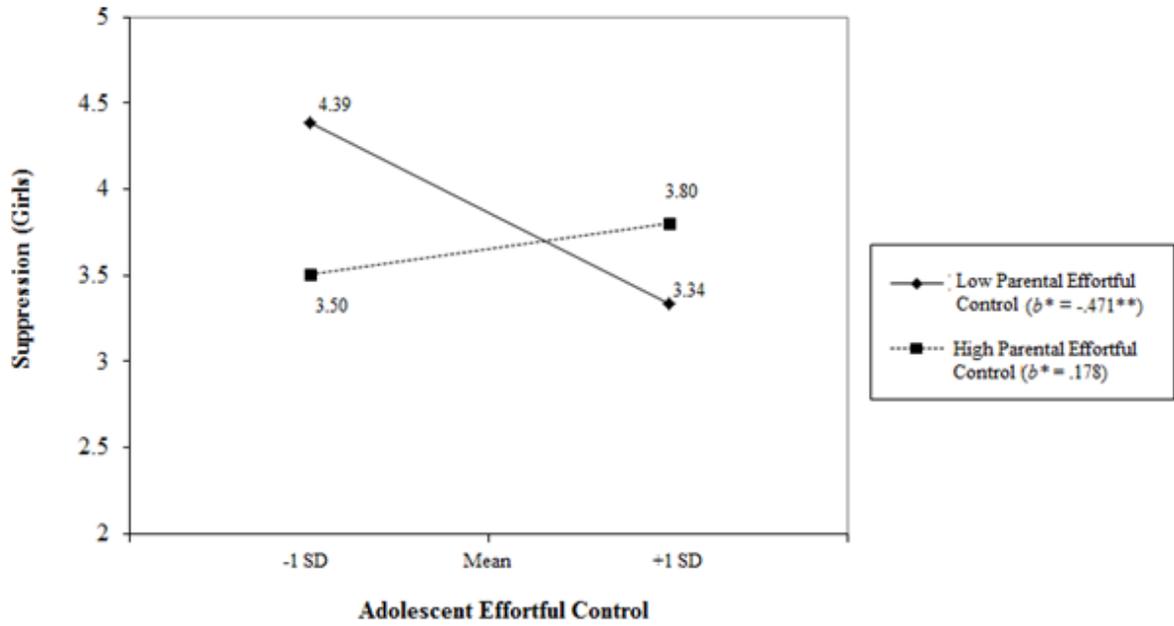


Figure 5. Simple slopes analysis of interaction effects.

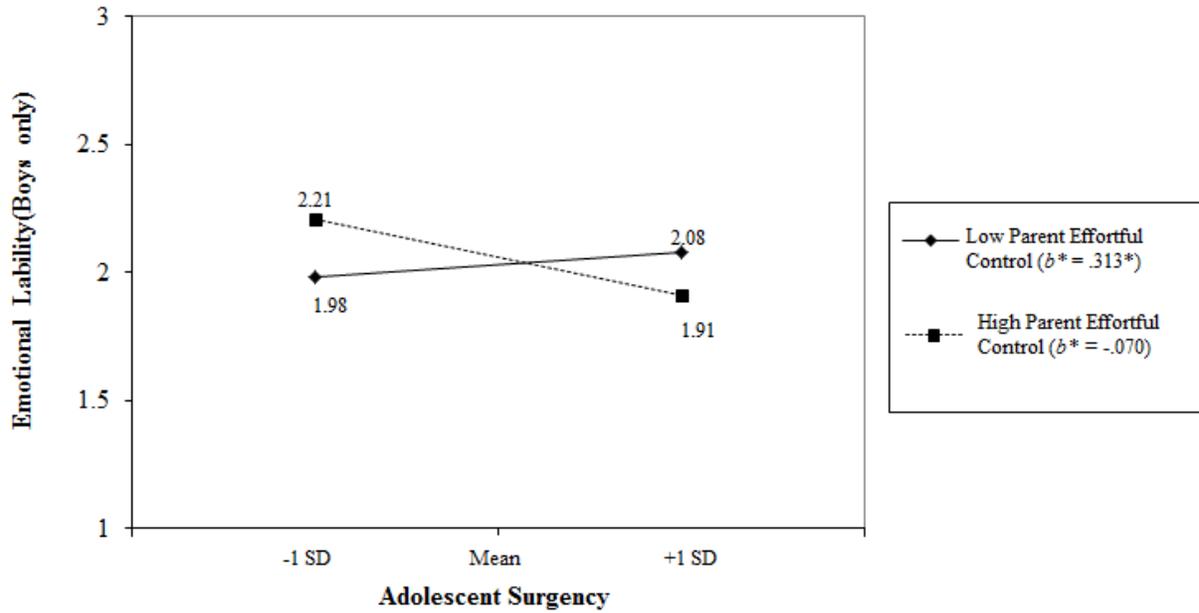


Figure 6. Simple slopes analysis of interaction effects.

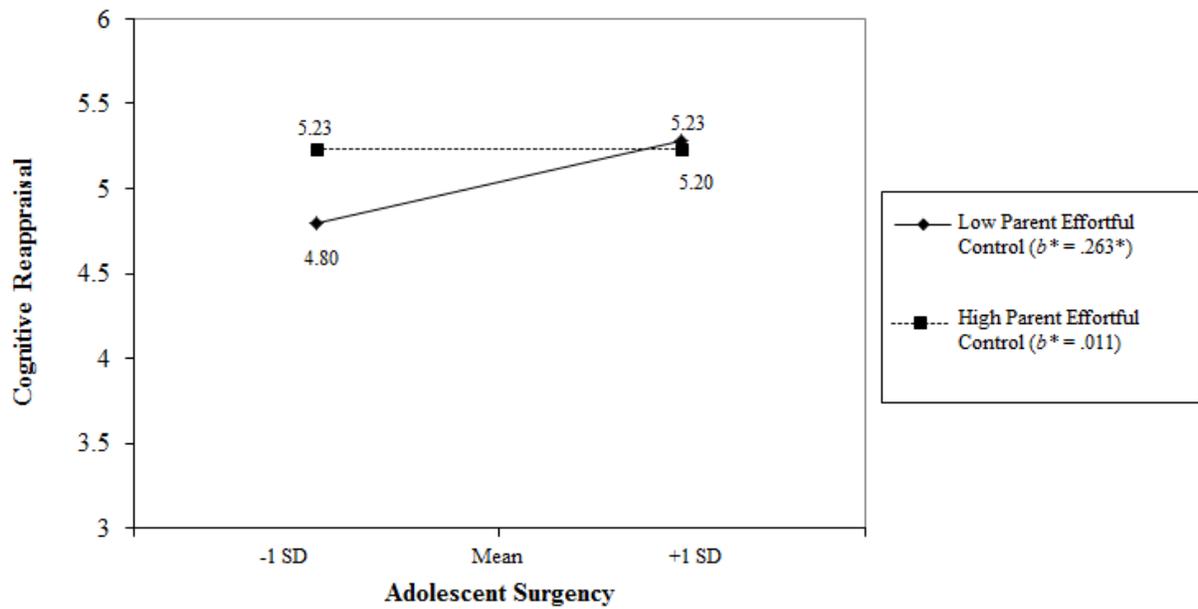


Figure 7. Simple slopes analysis of interaction effects.

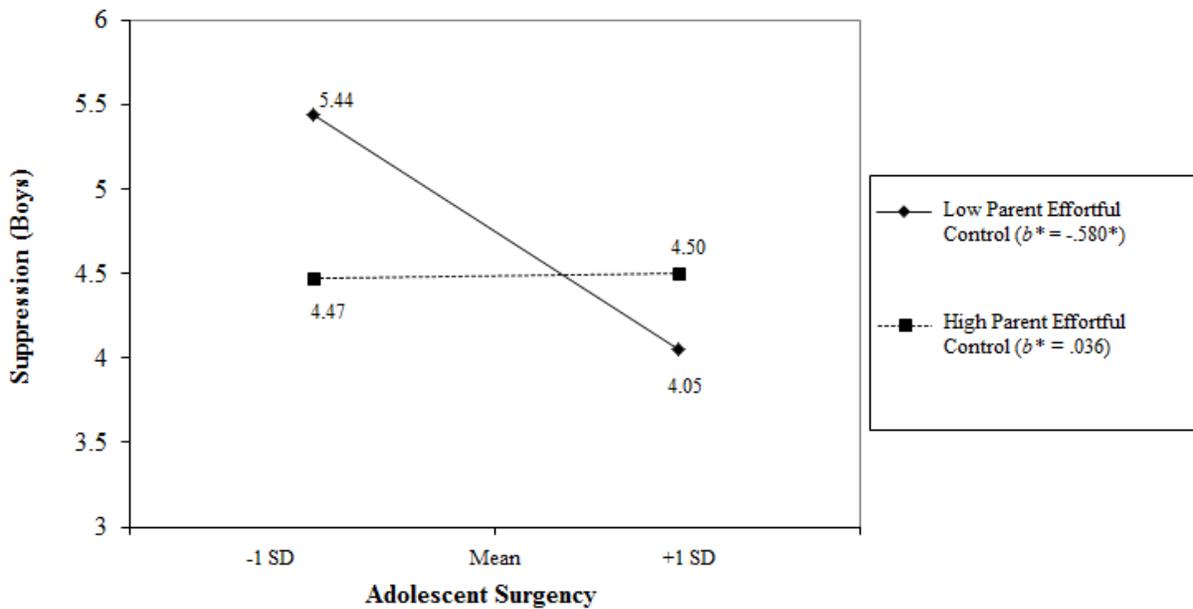


Figure 8. Simple slopes analysis of interaction effects.

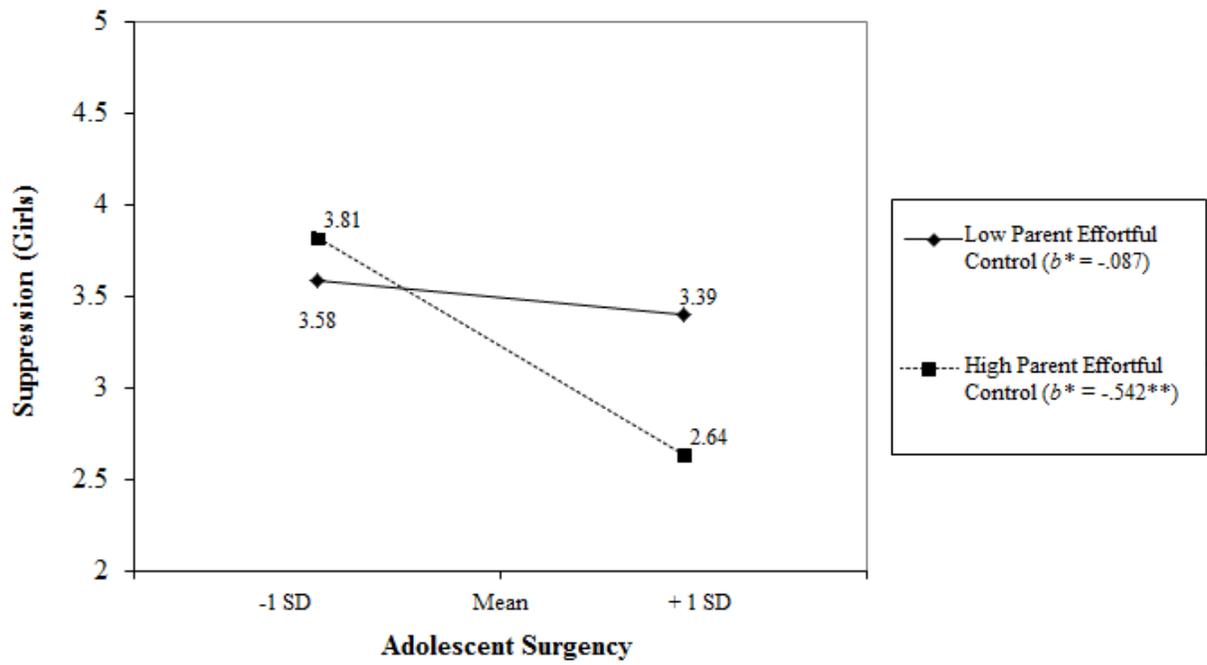


Figure 9. Simple slopes analysis of interaction effects.

Appendix A

Parent Demographic Interview

Introduction: I am going to ask you some basic questions about the work and educational experiences of yourself and of the people in your household. These questions are very important and need to be answered honestly. No one outside of the project will ever have access to this information. The information that you provide us will not affect any services or assistance that you might be receiving. This information will only be used for the purposes of our research. (INTERVIEWER- Please mark form but give parent a blank form to read along).

Note: this Appendix is edited to reflect only the relevant questions that will be used in my analyses

What is your relation to the child?

RESNM _____

(1=mother, 2=father, 3=grandmother, 4=grandfather, 5=foster parent,
6=other – specify who other is _____).

R_GENDER: Male Female

If respondent is not the biological parent ask:

“How long has this child been in your care?” RCARE _____

How old are you? (Record age in years.)

AGE _____

What are your birth month and year?

___/___
Month Year

Now I am going to ask you about your current family situation.

What language do you usually speak at home?

- 1 = English
- 2 = Spanish
- 3 = Other

RLANG _____

What is your current marital status- married, widowed, separated, divorced, or never married? (*If separated, ask “Is this separation legal or not legal?”*)

- 1 = never married
- 2 = married
- 3 = widowed
- 4 = divorced
- 5 = legally separated
- 6 = separated, not legally

RMASTAT _____

7 = living with someone as though married

What is the name of the child who is participating with you in this study?

What is the date of birth of the child who is participating with you in this study?

_____ (month) _____ (date) _____ (year)

How would you describe your own race?

RRACE _____

How would you describe the race of the child who is participating with you in this study?

CRACE _____

- 1 = American Indian/Alaska Native
- 2 = Asian
- 3 = Native Hawaiian or Other Pacific Islander
- 4 = Black or African American
- 5 = White
- 6 = More than one race
- 7 = Other _____

How would you describe your own ethnicity? RETH _____

- 1 = Hispanic or Latino
- 2 = Not Hispanic or Latino

How would you describe the ethnicity of the child who is participating with you in this study?

CETH _____

- 1 = Hispanic or Latino
- 2 = Not Hispanic or Latino

How many years of school do you have credit for altogether? (*Use 1-12 for elementary school through high school; 13-16 for college undergraduate work; and use 17 as the cap for the highest grade in school when the respondent has some post undergraduate work. Do not add years for GED.*)

REDUC _____

What is the highest education degree or certificate you hold?

- 0 = None
- 1 = Elementary School / Junior High
- 2 = GED (General Education Development)
- 3 = High School Diploma
- 4 = Vocational / Technical Diploma
- 5 = Associate Degree
- 6 = RN Diploma
- 7 = Bachelor Degree
- 8 = Master Degree
- 9 = Doctorate: MD., Ph.D., J.D., etc.

RDEGREE _____

RHED _____

Appendix B

Adolescent Demographic Interview

1. How old are you? _____

2. What is your gender?

- A. Male
- B. Female

3. How would you describe your own race?

- 1) American Indian/Alaska Native
- 2) Asian
- 3) Native Hawaiian or Other Pacific Islander
- 4) Black or African American
- 5) White
- 6) More than one race
- 7) Other _____

4. How would you describe your own ethnicity?

- 1) Hispanic or Latino
- 2) Not Hispanic or Latino

5. Are you in school?

- 1) Middle school
- 2) High School
- 3) College
- 4) Not in school

Other (Please specify) _____

Appendix C

EATQ-R

Directions

On the following page you will find a series of statements that people might use to describe themselves. The statements refer to a wide number of activities and attitudes.

For each statement, please circle the answer that best describes how true each statement is **for you**. There are no best answers. People are very different in how they feel about these statements. Please circle the first answer that comes to you.

You will use the following scale to describe how true or false a statement is about you:

Circle number:

If the statement is:

- | | |
|---|---|
| 1 | Almost always untrue of you |
| 2 | Usually untrue of you |
| 3 | Sometimes true, sometimes untrue of you |
| 4 | Usually true of you |
| 5 | Almost always true of you |

NOTE: Please make certain to answer all questions.

How true is each statement for you?	1) Almost always untrue	2) Usually untrue	3) Sometimes true, sometimes untrue	4) Usually true	5) Almost always true
1) It is easy for me to really concentrate on homework problems.	1	2	3	4	5
2) I feel pretty happy most of the day.	1	2	3	4	5
3) I think it would be exciting to move to a new city.	1	2	3	4	5
4) If I'm mad at somebody, I tend to say things that I know will hurt their feelings.	1	2	3	4	5
5) I have a hard time finishing things on time.	1	2	3	4	5
6) I feel shy with kids of the opposite sex.	1	2	3	4	5
7) When I am angry, I throw or break things.	1	2	3	4	5
8) It's hard for me not to open presents before I'm supposed to.	1	2	3	4	5
9) My friends seem to enjoy themselves more than I do.	1	2	3	4	5
10) If I get really mad at someone, I might hit them.	1	2	3	4	5
11) When someone tells me to stop doing something, it is easy for me to stop.	1	2	3	4	5
12) I feel shy about meeting new people.	1	2	3	4	5
13) I do something fun for a while before starting my homework, even when I'm not supposed to.	1	2	3	4	5
14) I wouldn't like living in a really big city, even if it was safe.	1	2	3	4	5
15) It often takes very little to make me feel like crying.	1	2	3	4	5
16) I tend to be rude to people I don't like.	1	2	3	4	5
17) It bothers me when I try to make a phone call and the line is busy.	1	2	3	4	5

How true is each statement for you?	1) Almost always untrue	2) Usually untrue	3) Sometimes true, sometimes untrue	4) Usually true	5) Almost always true
18) The more I try to stop myself from doing something I shouldn't, the more likely I am to do it.	1	2	3	4	5
19) Skiing fast down a steep slope sounds scary to me.	1	2	3	4	5
20) I get sad more than other people realize.	1	2	3	4	5
21) If I have a hard assignment to do, I get started right away.	1	2	3	4	5
22) I get frightened riding with a person who likes to speed.	1	2	3	4	5
23) I find it hard to shift gears when I go from one class to another at school.	1	2	3	4	5
24) I worry about my family when I'm not with them.	1	2	3	4	5
25) I get very upset if I want to do something and my parents won't let me.	1	2	3	4	5
26) I get sad when a lot of things are going wrong.	1	2	3	4	5
27) When trying to study, I have difficulty tuning out background noise and concentrating.	1	2	3	4	5
28) I finish my homework before the due date.	1	2	3	4	5
29) I worry about getting into trouble.	1	2	3	4	5
30) I am good at keeping track of several different things that are happening around me.	1	2	3	4	5
31) I would not be afraid to try a risky sport, like deep-sea diving.	1	2	3	4	5
32) It's easy for me to keep a secret.	1	2	3	4	5
33) I am shy.	1	2	3	4	5
34) I am nervous of some of the kids at school who push people into lockers and throw your books around.	1	2	3	4	5

How true is each statement for you?	1) Almost always untrue	2) Usually untrue	3) Sometimes true, sometimes untrue	4) Usually true	5) Almost always true
35) I get irritated when I have to stop doing something that I am enjoying.	1	2	3	4	5
36) I wouldn't be afraid to try something like mountain climbing.	1	2	3	4	5
37) I put off working on projects until right before they're due.	1	2	3	4	5
38) When I'm really mad at a friend, I tend to explode at them.	1	2	3	4	5
39) I worry about my parent(s) dying or leaving me.	1	2	3	4	5
40) I enjoy going places where there are big crowds and lots of excitement.	1	2	3	4	5
41) I am not shy.	1	2	3	4	5
42) I feel sad even when I should be enjoying myself, like at Christmas or on a trip.	1	2	3	4	5
43) It really annoys me to wait in long lines.	1	2	3	4	5
44) I feel scared when I enter a darkened room at home.	1	2	3	4	5
45) I pick on people for no real reason.	1	2	3	4	5
46) I pay close attention when someone tells me how to do something.	1	2	3	4	5
47) I get very frustrated when I make a mistake in my school work.	1	2	3	4	5
48) I tend to get in the middle of one thing, then go off and do something else.	1	2	3	4	5
49) It frustrates me if people interrupt me when I'm talking.	1	2	3	4	5
50) I can stick with my plans and goals.	1	2	3	4	5
51) I get upset if I'm not able to do a task really well.	1	2	3	4	5

Appendix D

ATQ

On the following pages you will find a series of statements that individuals can use to describe themselves. There are no correct or incorrect responses. All people are unique and different, and it is these differences which we are trying to learn about. Please read each statement carefully and give your best estimate of how well it describes you. Circle the appropriate number below to indicate how well a given statement describes you.

- 1 = extremely untrue of you**
- 2 = quite untrue of you**
- 3 = slightly untrue of you**
- 4 = neither true nor false of you**
- 5 = slightly true of you**
- 6 = quite true of you**
- 7 = extremely true of you**
- X = not applicable**

If one of the statements does not apply to you (for example, if it involves driving a car and you don't drive), then circle "X" (not applicable). Check to make sure that you have answered every item.

	1 extremely untrue	2 quite untrue	3 slightly untrue	4 neither true nor false	5 slightly true	6 quite true	7 extremely true	X not applicable
1.	I become easily frightened.							
	1	2	3	4	5	6	7	X
2.	I am often late for appointments.							
	1	2	3	4	5	6	7	X
3.	Sometimes minor events cause me to feel intense happiness.							
	1	2	3	4	5	6	7	X
4.	I find loud noises to be very irritating.							
	1	2	3	4	5	6	7	X
5.	It's often hard for me to alternate between two different tasks.							
	1	2	3	4	5	6	7	X
6.	I rarely become annoyed when I have to wait in a slow moving line.							
	1	2	3	4	5	6	7	X
7.	I would not enjoy the sensation of listening to loud music with a laser light show.							
	1	2	3	4	5	6	7	X
8.	I often make plans that I do not follow through with.							
	1	2	3	4	5	6	7	X
9.	I rarely feel sad after saying goodbye to friends or relatives.							
	1	2	3	4	5	6	7	X
10.	Even when I feel energized, I can usually sit still without much trouble if it's necessary.							
	1	2	3	4	5	6	7	X
11.	Looking down at the ground from an extremely high place would make me feel uneasy.							
	1	2	3	4	5	6	7	X
12.	I would not enjoy a job that involves socializing with the public.							
	1	2	3	4	5	6	7	X
13.	I can keep performing a task even when I would rather not do it.							
	1	2	3	4	5	6	7	X

	1 extremely untrue	2 quite untrue	3 slightly untrue	4 neither true nor false	5 slightly true	6 quite true	7 extremely true	X not applicable
14.	I sometimes seem to be unable to feel pleasure from events and activities that I should enjoy.							
	1	2	3	4	5	6	7	X
15.	I find it very annoying when a store does not stock an item that I wish to buy.							
	1	2	3	4	5	6	7	X
16.	I usually like to talk a lot.							
	1	2	3	4	5	6	7	X
17.	I seldom become sad when I watch a sad movie.							
	1	2	3	4	5	6	7	X
18.	When I am enclosed in small places such as an elevator, I feel uneasy.							
	1	2	3	4	5	6	7	X
19.	When listening to music, I usually like to turn up the volume more than other people.							
	1	2	3	4	5	6	7	X
20.	Sometimes minor events cause me to feel intense sadness.							
	1	2	3	4	5	6	7	X
21.	It is easy for me to hold back my laughter in a situation when laughter wouldn't be appropriate.							
	1	2	3	4	5	6	7	X
22.	I can make myself work on a difficult task even when I don't feel like trying.							
	1	2	3	4	5	6	7	X
23.	I rarely ever have days where I don't at least experience brief moments of intense happiness.							
	1	2	3	4	5	6	7	X
24.	When I am trying to focus my attention, I am easily distracted.							
	1	2	3	4	5	6	7	X
25.	I would probably enjoy playing a challenging and fast paced video-game that makes lots of noise and has lots of flashing, bright lights.							
	1	2	3	4	5	6	7	X

	1 extremely untrue	2 quite untrue	3 slightly untrue	4 neither true nor false	5 slightly true	6 quite true	7 extremely true	X not applicable
26.	Whenever I have to sit and wait for something (e.g., a waiting room), I become agitated.							
	1	2	3	4	5	6	7	X
27.	I'm often bothered by light that is too bright.							
	1	2	3	4	5	6	7	X
28.	I seldom become sad when I hear of an unhappy event.							
	1	2	3	4	5	6	7	X
29.	When interrupted or distracted, I usually can easily shift my attention back to whatever I was doing before.							
	1	2	3	4	5	6	7	X
30.	I find certain scratchy sounds very irritating.							
	1	2	3	4	5	6	7	X
31.	I like conversations that include several people.							
	1	2	3	4	5	6	7	X
32.	I am usually a patient person.							
	1	2	3	4	5	6	7	X
33.	It is very hard for me to focus my attention when I am distressed.							
	1	2	3	4	5	6	7	X
34.	Very bright colors sometimes bother me.							
	1	2	3	4	5	6	7	X
35.	I can easily resist talking out of turn, even when I'm excited and want to express an idea.							
	1	2	3	4	5	6	7	X
36.	I would probably not enjoy a fast, wild carnival ride.							
	1	2	3	4	5	6	7	X
37.	I sometimes feel sad for longer than an hour.							
	1	2	3	4	5	6	7	X
38.	I rarely enjoy socializing with large groups of people.							
	1	2	3	4	5	6	7	X

	1 extremely untrue	2 quite untrue	3 slightly untrue	4 neither true nor false	5 slightly true	6 quite true	7 extremely true	X not applicable
39.	If I think of something that needs to be done, I usually get right to work on it.							
	1	2	3	4	5	6	7	X
40.	It doesn't take very much to make feel frustrated or irritated.							
	1	2	3	4	5	6	7	X
41.	It doesn't take much to evoke a happy response in me.							
	1	2	3	4	5	6	7	X
42.	When I am happy and excited about an upcoming event, I have a hard time focusing my attention on tasks that require concentration.							
	1	2	3	4	5	6	7	X
43.	Sometimes, I feel a sense of panic or terror for no apparent reason.							
	1	2	3	4	5	6	7	X
44.	I often have trouble resisting my cravings for food drink, etc.							
	1	2	3	4	5	6	7	X
45.	Colorful flashing lights bother me.							
	1	2	3	4	5	6	7	X
46.	I usually finish doing things before they are actually due (for example, paying bills, finishing homework, etc.).							
	1	2	3	4	5	6	7	X
47.	I often feel sad.							
	1	2	3	4	5	6	7	X
48.	I usually remain calm without getting frustrated when things are not going smoothly for me.							
	1	2	3	4	5	6	7	X
49.	Loud music is unpleasant to me.							
	1	2	3	4	5	6	7	X
50.	When I'm excited about something, it's usually hard for me to resist jumping right into it before I've considered the possible consequences.							
	1	2	3	4	5	6	7	X

	1	2	3	4	5	6	7	X
	extremely untrue	quite untrue	slightly untrue	neither true nor false	slightly true	quite true	extremely true	not applicable

51. Loud noises sometimes scare me.
1 2 3 4 5 6 7 X
52. When I see an attractive item in a store, it's usually very hard for me to resist buying it.
1 2 3 4 5 6 7 X
53. I would enjoy watching a laser show with lots of bright, colorful flashing lights.
1 2 3 4 5 6 7 X
54. When I hear of an unhappy event, I immediately feel sad.
1 2 3 4 5 6 7 X
55. I usually like to spend my free time with people.
1 2 3 4 5 6 7 X
56. It does not frighten me if I think that I am alone and suddenly discover someone close by.
1 2 3 4 5 6 7 X
57. It takes a lot to make me feel truly happy.
1 2 3 4 5 6 7 X
58. When I am afraid of how a situation might turn out, I usually avoid dealing with it.
1 2 3 4 5 6 7 X
59. I especially enjoy conversations where I am able to say things without thinking first.
1 2 3 4 5 6 7 X
60. When I try something new, I am rarely concerned about the possibility of failing.
1 2 3 4 5 6 7 X
61. It is easy for me to inhibit fun behavior that would be inappropriate.
1 2 3 4 5 6 7 X
62. I would not enjoy the feeling that comes from yelling as loud as I can.
1 2 3 4 5 6 7 X

Appendix E

ERC

The following statements describe how people respond to different situations. Please select the number that best describes you. Be sure you give an answer for all the statements.

	1) Rarely/Never	2) Sometimes	3) Often	4) Almost always
1. I am a cheerful person.	1	2	3	4
2. I move quickly from a good mood to a bad mood.	1	2	3	4
3. I respond well (positively) to adults when they act friendly or neutral to me.	1	2	3	4
4. I don't get angry, worried, distressed, upset, or worked up when changing from one thing to another. I shift well from one activity to another.	1	2	3	4
5. When I am emotionally upset or frustrated by something that happens, I start to feel better pretty quickly (I don't stay sad or worried for a long time).	1	2	3	4
6. I am easily frustrated.	1	2	3	4
7. I respond well (positively) when friends act friendly or neutral to me.	1	2	3	4
8. It is easy for me to have an angry outburst or temper tantrums when I get angry.	1	2	3	4
9. I can wait to get something I really want.	1	2	3	4
10. I like it when other people are upset (for example, I like teasing others or I laugh when another person gets hurt or punished).	1	2	3	4
11. I don't get carried away during exciting situations or too excited at the wrong time or place.	1	2	3	4
12. I am whiny or clingy with adults.	1	2	3	4

	1) Rarely/Never	2) Sometimes	3) Often	4) Almost always
13. I often bother other people because I am too active or too excited about something.	1	2	3	4
14. I get angry when adults set limits (tell me that I cannot do something).	1	2	3	4
15. I can say when I am feeling sad, angry or mad, fearful or afraid.	1	2	3	4
16. I feel sad or I have no energy.	1	2	3	4
17. I get too excited when trying to get other people to play or do things with me.	1	2	3	4
18. I show very little feeling. People think I don't have feelings.	1	2	3	4
19. I act negatively (I get scared or speak to friends in an angry tone of voice) when my friends are acting neutral or trying to be friendly.	1	2	3	4
20. I do things without first thinking them through.	1	2	3	4
21. I show concern and understanding when others are upset or distressed.	1	2	3	4
22. My excitement bothers other people.	1	2	3	4
23. When friends are mean to me or treat me badly, I have normal negative feelings such as anger, fear or frustration.	1	2	3	4
24. I show negative feelings (anger, fear, or frustration) when I try to get someone to play or do something with me.	1	2	3	4

Appendix F

Items removed from ERC Lability/Negativity subscale due to overlap with items from the EATQ

Item 6. I am easily frustrated.

Item 9. I can wait to get something I really want.

Item 14. I get angry when adults set limits (tell me that I cannot do something).

Item 19. I act negatively (I get scared or speak to friends in an angry tone of voice) when my friends are acting neutral or trying to be friendly.

Item 20. I do things without first thinking them through.

Item 24. I show negative feelings (anger, fear, or frustration) when I try to get someone to play or do something with me.

Appendix G

ERQ

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

1-----2-----3-----4-----5-----6-----7
strongly neutral strongly
disagree agree

1. When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about*.

1-----2-----3-----4-----5-----6-----7
strongly neutral strongly
disagree agree

2. I keep my emotions to myself.

1-----2-----3-----4-----5-----6-----7
strongly neutral strongly
disagree agree

3. When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about*.

1-----2-----3-----4-----5-----6-----7
strongly neutral strongly
disagree agree

4. When I am feeling *positive* emotions, I am careful not to express them.

1-----2-----3-----4-----5-----6-----7
strongly neutral strongly
disagree agree

5. When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.

1-----2-----3-----4-----5-----6-----7
strongly neutral strongly
disagree agree

6. I control my emotions by *not expressing them*.

1-----2-----3-----4-----5-----6-----7
strongly neutral strongly
disagree agree

7. When I want to feel more *positive* emotion, I *change the way I'm thinking* about the situation.

1-----2-----3-----4-----5-----6-----7
strongly neutral strongly
disagree agree

8. I control my emotions by *changing the way I think* about the situation I'm in.

1-----2-----3-----4-----5-----6-----7
strongly neutral strongly
disagree agree

9. When I am feeling *negative* emotions, I make sure not to express them.

1-----2-----3-----4-----5-----6-----7
strongly neutral strongly
disagree agree

10. When I want to feel less *negative* emotion, I *change the way I'm thinking* about the situation.

1-----2-----3-----4-----5-----6-----7
strongly neutral strongly
disagree agree