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ADOLESCENTS' STRESS AND HEALTH:
PARENTAL INFLUENCES AND COGNITIVE MEDIATORS

by

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ABSTRACT

Research to date indicates that parental and cognitive variables play a role in stress responses and health outcomes. Although researchers are beginning to focus on developmental processes in stress/health outcomes, there is little research examining which parental behaviors are most predictive of stress/health and whether cognitive variables mediate this relationship. As a result, the current study examines the self-reports of 160 late adolescents regarding parental behaviors, cognitive variables, and stress/health outcomes. In addition, blood pressure reactivity to a stressful situation was collected as a physiological measure of stress. The results suggest that, among the parental behaviors that are examined, parental overprotection and poor monitoring are the most predictive variables of adolescents' stress/health. The results indicate that adolescents' cognitions also are significant predictors of their self-reported stress/health. Further, adolescents' cognitions fully mediate the relationship between paternal behaviors and stress/health outcomes and partially mediate the relationship between maternal behaviors and stress/health outcomes. Finally, measures of blood pressure reactivity are not significantly related to study variables or were related in unpredicted directions. Possible explanations for these results are discussed. Overall, future research should examine parental overprotection and poor monitoring as important distal variables in adolescents' stress/health but should examine adolescents' cognitions as a more salient and immediate predictor of adolescents' stress/health.

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CHAPTER ONE: INTRODUCTION

An increasing body of literature demonstrates that stress plays a significant role in the onset and maintenance of health problems (Carstensen, 1989). Moreover, social relationships and cognitive perceptions are related to stress over and above the actual intensity of life stressors (Kiecolt-Glaser & Glaser, 1989; Uchino, Cacioppo, & Kiecolt-Glaser, 1996; Ursin & Eriksen, 2004). Specifically, studies show that individuals' cognitive appraisals of threat, perceptions of coping ability, and outcome expectancies are important predictors of stress and health outcomes (Bisignano & Bush, 2004; Brosschot, Pieper, & Thayer, 2005; Folkman, Lazarus, Gruen, & DeLongis, 1986; Gallagher, Parle, & Cairns, 2002; Ursin & Eriksen, 2004). Furthermore, studies find that social relationships and cognitive variables predict stress and health outcomes as early as childhood and adolescence. These findings suggest the importance of early developmental trajectories for these outcomes (El-Sheikh & Harger, 2001; Fisher, Gunnar, Chamberlain, & Reid, 2000; Gottman & Katz, 1989; McCarthy, Moller, & Fouladi, 2001; Russek & Schwartz, 1997a, 1997b). Finally, social and cognitive contributors to stress and health are increasingly important in treatment and prevention efforts (Carstensen, 1989; Hanson, Klesges, Eck, & Cigrang, 1990). Given these findings, understanding the relationships among social relationships, cognitions, and stress/health in children, adolescents, and emerging adults is important in the early prevention of health problems.

Although social relationships appear to be important for health outcomes, few studies examine health outcomes in the context of the parent-child relationship. The dearth of literature

in this area is particularly surprising given that parents may be a particularly salient social

relationship during the development of children, adolescents, and emerging adults. Research is

just beginning to examine the importance of parental variables in the onset of stress responses

and disease processes, however. Of particular interest to the current study, research suggests that

several specific parental variables are related to stress and health outcomes in children,

adolescents, and emerging adults. These parental variables include marital conflict, parent-child

bonding, parental behaviors, and parental perceptions of their children (El-Sheikh & Harger,

2001; Gottman & Katz, 1989; McCarthy et al., 2001; Russek, Schwartz, Bell, & Baldwin, 1998).

Although previous research documents relationships among parental variables, cognitive

variables, and stress and health outcomes, this research has yet to confirm which of these

variables may serve as consistent mechanisms of action in explaining the relationships among

these variables. Consequently, to further the current body of literature regarding relationships

between social and cognitive contributors to stress and health outcomes, this study examines the

paths of relationships among parental variables, adolescents' cognitive perceptions, and

adolescents' stress and health outcomes.

In particular, the research on parental and cognitive predictors of stress and health

outcomes has been lacking in two important areas. First, few studies examine parental variables

simultaneously to see which may be most valuable in predicting children's or adolescents' stress

and health outcomes. Second, few studies assess whether the parental variables that are related to

stress and health outcomes promote changes in cognitions and outcome expectancies in children

and adolescents. In the studies that do examine mediational relationships among these variables,

evidence indicates that the relationship between parental variables (e.g., attachment, marital discord) and stress outcomes in children is mediated by cognitive variables (e.g., perceived resources, mood-regulation expectancies, perceptions of threat; El-Sheikh & Harger, 2001; McCarthy, Lambert, & Moller, 2006). These two neglected areas of study could provide important information regarding the most salient points of intervention in improving stress and health outcomes for children and adolescents.

In summary, research indicates that parental and cognitive variables are important predictors of stress and health outcomes in children and adolescents. It appears, however, that more research is needed to clarify which specific parental variables are most important to the stress and health outcomes of children and adolescents and to determine whether cognitive variables in children and adolescents mediate these relationships. Based on these research needs, the aims of the current study are 1) to examine which parental variables are most predictive of stress and health in adolescents, 2) to determine whether adolescents' cognitions mediate the relationship between parental variables and adolescents' stress and health outcomes, and 3) to establish a model explaining pathways of relationships among parental variables, cognitive variables, and stress and health outcomes for adolescents.

Health, Stress, and Psychosocial Correlates

With the aim of the current study being to examine variables that contribute to stress and health outcomes, it is important to clarify definitions of stress and health as well as the ways in which stress and health are related processes. Thus, this section will provide an introduction to

the cognitive and psychosocial variables that contribute to stress and health outcomes. Finally, the methods for measuring stress and health in the current literature will be described here.

Health and Stress Outcomes

Health outcomes encompass many different types of physical states and various symptom levels. Overall, though, health is defined as the relative freedom from, or the level of occurrence of, physical and mental diseases and disorders (Corsini, 2002; Guralnik, 1984). In particular, health refers to the body's ability to perform necessary functions of life normally and properly. This level of functioning requires that several bodily systems remain in homeostasis (Guralnik, 1984; Merriam-Webster & MedlinePlus, 2005). When the body's homeostasis is violated in some way, stress (i.e., the alarm system that alerts the mind when the body is outside of homeostatic bounds or is in danger of leaving homeostasis) is experienced (Eriksen, Murison, Pensgaard, & Ursin, 2005; Ursin & Eriksen, 2004).

In fact, the stress response is found in all species and has evolved as a health promoting mechanism. Health is promoted when the unpleasantness of the alarm prompts a re-establishment of homeostasis (Eriksen et al., 2005). Research indicates, however, that prolonged stress responses are detrimental to health processes. Selye (1936) is one of the first researchers to note that a prolonged stress response can result in physical illness and even death. He refers to the prolonged stage of the stress response as exhaustion. He notes that a variety of stressors could induce exhaustion and that the endocrine and nervous systems respond globally to create detrimental effects in a process he terms *General Adaptation Syndrome* (Selye, 1953). Other researchers have focused on the level of physical burden from prolonged stress, referred to as

allostatic load (Mason, 1968; McEwen, 2000). More specifically, allostatic load is the strain on

the body's health system that results from its exertion to maintain homeostasis in adverse (i.e.,

stressful) psychosocial or physical situations (McEwen, 2000). In summary, the stress response

compromises the body's health when the burden of stress is prolonged over time. Due to such

strong relationships between the stress response and health outcomes, "stress/health" will be

used throughout this manuscript to refer to prolonged physiological stress responses and their

contribution to allostatic load and disease.

Another important concept to consider with regard to health outcomes is an individual's

engagement in health behaviors, also known as health-related behaviors or health habits. These

behaviors are defined as activities and lifestyles that have a direct impact on physical disease

processes in the body (Bridle et al., 2005; Wiefferink et al., 2006). For instance, research

indicates that smoking, diet, exercise, and amount of sleep are direct mechanisms of impact on

the health of adults (Schoenborn, 1986). These behaviors also are becoming increasingly

important in the study of adolescent health due to the finding that poor health behaviors and

concomitant health problems increase in adolescents from the late teens years through the early

twenties (Furstenberg, 2006). Furthermore, research finds that adolescents' health behaviors are

influenced by parental variables such as caring, monitoring, and cohesion (Ackard, Neumark-

Sztainer, Story, & Perry, 2006; De Bourdeaudhuij & Van Oost, 1998; Markey, Ericksen,

Markey, & Tinsley, 2001; Resnick et al., 1997). As a result, health behaviors (e.g., smoking,

physical activity, diet, sleep habits, use of drugs) are measured in this study, so as to provide a

context for the relationship between parental variables, adolescents' cognitions, and adolescents' stress/health outcomes.

Psychosocial and Cognitive Correlates of Stress/Health

In studying the role of the stress response on allostatic load and health, researchers note that social relationships play an influential role in the stress response and in health outcomes. For example, a prospective research study indicates that social relationships are the strongest predictors of mortality across a nine-year span (Berkman & Syme, 1994). Similar research indicates that the quality and quantity of social relationships are predictive of numerous health outcomes, including physical ailments and mortality (House, Landis, & Umberson, 1988; Uchino et al., 1996). Children's social environment also predicts stress/health outcomes. For instance, research indicates that an early parent-child relationship marked by abuse or neglect predicts higher physiological stress and allostatic load. Such prediction is especially strong when the abuse and neglect leads to negative outcomes (e.g., depression, anxiety, social isolation, hostility; Bremner, Randall, Vermetten, & Staib, 1997; De Bellis, Baum et al., 1999; De Bellis, Keshavan et al., 1999; McEwen, 2000). Taken together, social relationships predict a wide variety of stress/health outcomes. In particular and of importance for this study, studies show that parent-child relationships predict stress/health outcomes in children and adolescents.

Researchers also note that cognitive variables play an influential role in the onset of the stress response and health outcomes (Folkman et al., 1986; Lazarus & Folkman, 1986; McEwen, 2000; Schulkin, Gold, & McEwen, 1998). For instance, one study indicates that cognitive factors are important to stress and immune functioning following grief (Bower, Kemeny, Taylor, &

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Fahey, 2003). Specifically, greater cognitive interpretation of positive meanings for loss, but not release of grief through writing, is related to lower distress and increased immune functioning in bereaved individuals undergoing grief therapy (Bower et al., 2003). Other research suggests that a negative stress response is related to the interpretation of events as threatening rather than challenging (Lazarus & Folkman, 1986). Furthermore, the literature suggests that, when individuals perceive the world as threatening or their thinking perseverates on threat, the stress response is prolonged and creates allostatic load (Brosschot et al., 2005; Eriksen et al., 2005; Ursin & Eriksen, 2004). In other words, the initiation of the stress response depends on cognitive interpretations of threat, and prolonged stress (i.e., allostatic load) depends on ruminative thinking or frequent perceptions of threat.

Current research focuses on these social (i.e., social relationships) and cognitive factors despite the findings that genetic inheritance and health behaviors also contribute to stress/health outcomes (Carstensen, 1989; Eriksen, Olff, Murison, & Ursin, 1999; Matthews, Manuck, Stoney, & Rakaczky, 1988; McCarthy et al., 2006; Parent et al., 2005). By examining these factors, changeable components in the environment may be uncovered and manipulated to change both the stress response and the interaction between the environment and gene expression. In support of this endeavor, research indicates that social and cognitive factors are as valuable in predicting health outcomes as physical factors (e.g., diet, exercise, blood pressure; Folkman et al., 1986; House et al., 1988; Lazarus & Folkman, 1986). Furthermore, research shows that social and cognitive factors predict health outcomes above and beyond physical indicators. For example, one study reports that cognitive variables (e.g., optimism) are related to faster healing, whereas

health-related behaviors (e.g., alcohol consumption, exercise, healthy eating, sleep) are not (Ebrecht et al., 2004). Moreover, a thorough review of the literature reveals that social factors are related to health independent of health-related behaviors (Uchino et al., 1996). Finally, studies using experimental designs suggest that changing social and cognitive factors may reduce physiological responses to stress. These effects last for several months, thereby reducing the physiological mechanisms that contribute to allostatic load (Fisher et al., 2000; Gaab et al., 2003; Hammerfald et al., 2006; Ursin & Eriksen, 2004).

In general, a substantial body of literature suggests that social and cognitive variables are related to stress/health outcomes. The specific social and cognitive variables of interest to this study and their particular relationships to stress/health will be detailed more thoroughly throughout this manuscript. In addition, the social variables discussed in this manuscript are related to stress/health in animals as well as in children, adolescents, and adults (El-Sheikh & Harger, 2001; Fisher et al., 2000; Uchino et al., 1996; Weiss, 1967, 1971b). As a result, each social and cognitive variable discussed in the remainder of this manuscript will be organized according to the animal, adult, and child literature on the topic, as applicable.

Physiological Measures

The following paragraphs will detail various physiological mechanisms of stress/health and the physiological measures that are used to assess or predict stress/health. For the current study, blood pressure reactivity (BP-R) was intended as the primary physiological indicator of stress/health. Based on the research described below, it is believed that parental and cognitive variables would predict higher levels of BP-R in adolescents experiencing a stressful situation.

Underlying Mechanisms. In an effort to understand the underlying mechanisms of the stress response and allostatic load, researchers utilize several physiological measures related to stress/health (Kamarck, Jennings, Pogue-Geile, & Manuck, 1994; Krantz & Manuck, 1984; Uchino et al., 1996). In a comprehensive review, Uchino and colleagues (1996) report that three major physiological processes related to stress/health and social support are endocrine functioning, cardiovascular functioning, and immune functioning. Furthermore, research documents that these three measures of physiological functions are interrelated (Uchino et al., 1996). Other research reveals that some of these physiological measures are sensitive to stress/health and psychosocial processes in mice and primates, suggesting that they are basic and relatively widespread indicators of the stress/health process (Capitanio, Mendoza, Mason, & Maninger, 2005; Priebe et al., 2005).

Blood Pressure Reactivity. In this study, blood pressure reactivity was intended as a measure of the physiological stress response, as it is related to the stress response and to the later development of cardiovascular disease (i.e., the leading cause of death in the United States in 2002; Krantz & Manuck, 1984; National Institute of Environmental Health Sciences et al., 2002). In addition, blood pressure reactivity is linked closely to other health problems as well as to social support factors, social stress, and cognitive stress (Dickerson & Kemeny, 2004; House et al., 1988; Kirschbaum, Pirke, & Hellhammer, 1993; Mason, 1968; Uchino et al., 1996).

An important consideration in using blood pressure reactivity as a physiological measure of stress/health is that it is not always a perfect indicator of stress in an individual. For example, self-reported indications of individuals' stress do not always correspond with physiological

measures of their stress (Walco, Conte, Labay, Engel, & Zeltzer, 2005). Research also demonstrates that blood pressure measures are not as accurate or reliable when sampled only once per participant during a study, relative to averaging multiple samplings of blood pressure for any given participant (Uchino et al., 1996). Thus, it is recommended that both physiological and self-report measures be used to assess stress/health and that multiple samplings of blood pressure be measured throughout a study (Uchino et al., 1996; Walco et al., 2005). Accordingly, the current study includes the measurement of participants' blood pressure at several points to provide multiple blood pressure samplings as well as several self-report measures that were to be combined with these blood pressure measures to assess stress/health.

Another consideration regarding physiological measures of stress/health is that blood pressure reactivity is not always correlated with other physiological measures of stress, depending on the testing conditions and the variables under investigation (Ballard, Cummings, & Larkin, 1993; Gunnar, 1987). In other words, not all stressors are associated with the same physiological stress response (e.g., physical stress can produce different physiological responses than social stress). Thus, the physiological measure chosen for research should be an adequate indicator of the type of stress investigated (Kemeny, 2003). In accordance with this recommendation, the physiological measure of focus in this study (i.e., blood pressure reactivity) is associated with the social and cognitive stressors under investigation. Specifically, in most studies, blood pressure in most participants changes significantly following social and cognitive stressors (e.g., the Trier Social Stress Test) and is considered an adequate indicator of social stress (Gottman & Katz, 1989; Kemeny, 2003; McCarthy et al., 2006; Uchino et al., 1996).

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Parental Variables In Relation to Stress/Health

As mentioned previously, social variables are related to stress/health outcomes. Considering the substantial influence of parents on children, adolescents, and emerging adults (Russek & Schwartz, 1997a) as well as findings that health differences begin in childhood (Hanson et al., 1990), parental variables may be particularly important to the stress/health outcomes of children, adolescents, and emerging adults. Thus, research is beginning to examine parental variables in retrospective and prospective studies and to find significant relationships between parental variables and stress/health outcomes in children and adolescents. In fact, in a review of the importance of social support in health functioning, Uchino and colleagues (1996) suggest that family relationships, as opposed to other social support, may be especially important to cardiovascular, endocrine, and immune functioning.

The parental variables examined in this study consist of different behaviors. In particular, these parental behaviors include bonding and attachment, use of punishment and consistency, positive parenting/involvement, and monitoring and control. Previous research finds that these parental behaviors predict stress/health outcomes in children and adolescents. Based on this research, it is hypothesized that these parental behaviors would be related to adolescents' cognitive perceptions and to their stress/health outcomes. Specifically, parental behaviors are hypothesized to predict adolescents' cognitive perceptions. In turn, these cognitive variables are expected to predict adolescents' stress/health outcomes. The research that provides a basis for these hypotheses is described in the following sections.

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In addition to parental behaviors, this study aimed to examine parental characteristics (e.g., parents' perceived stress, marital discord, parents' health) and parents' perceptions of their adolescents. These variables predict stress/health outcomes in children, adolescents, and adults. For example, higher maternal ratings of marital discord predict higher blood pressure reactivity to a stressful situation and greater Total Health Problems on the Cornell Medical Index in a sample of 89 elementary students (El-Sheikh & Harger, 2001). Likewise, parenting stress is related to increased cortisol reactivity and may be related to chronic differences in cortisol levels (Granger et al., 1998). Due to the unfortunately low parental participation in the current study, these parental variables could not be assessed and, therefore, will not be detailed in the following sections. Other parental behaviors of interest to this study will be examined, however.

Parental Behaviors

  Bonding and Attachment. The attachment that children form with their caregivers has been a primal and basic component of early socialization, both in non-human primates and in humans. Bowlby (1977) suggests that early attachment has long-lasting effects by providing a basis for secure exploration during infancy and by providing working models of emotional regulation that are used throughout individuals' lifetimes. Furthermore, he suggests that this early attachment is an innate predisposition between infants and their caregivers. Indeed, research on both non-human mammals and human infants reveals that infants may be wired (i.e., differently from adult brains) to form attachments to caregivers (Gunnar, 1998; Gunnar & Cheatham, 2003; Moriceau & Sullivan, 2005).

The bond that develops between children and their caregivers may be the result of specific behaviors exhibited by the caregivers (e.g., caring behaviors; Russek & Schwartz, 1997a). Indeed, several parental behaviors are related to positive relationships and stress/health outcomes. In mammals (e.g., mice), the level of mothers' care received by offspring creates significant differences in anxiety and corticosterone levels in cross-fostered offspring (Priebe et al., 2005). In this line of research, mice that are not predisposed genetically to anxiety are cross-fostered (i.e., raised adoptively) by mice genetically bred for high anxiety and low maternal care. The offspring who are raised by mothers with low care show increased anxious behavior and corticosterone levels relative to those who are reared by mothers with high care. Although genetics still explain much of the stress response, particularly in mice predisposed to anxiety, the effects of maternal care suggest that early rearing behaviors by mothers also are related significantly to stress and anxiety outcomes (Priebe et al., 2005).

This innate and long-lasting effect is supported by research on humans as well. A prospective study of 116 college males indicates that their perceptions of their relationships with their parents predict a variety of health outcomes (e.g., alcoholism, cardiovascular disease, ulcers) 35 years later (Russek & Schwartz, 1997a). Specifically, 91 percent of participants who report not having a warm relationship (i.e., low warmth and closeness) with their mothers have a diagnosed disease 35 years later (as compared to 45 percent of participants who report having warm maternal relationships). Similarly, low warmth and closeness with fathers corresponds to an 82 percent rate of diagnosed disease 35 years later relative to 50 percent in participants who have high warmth and closeness with their fathers. Only 25 percent of participants who endorse

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high closeness and warmth with both their mothers and fathers have a diagnosed disease 35 years later relative to 87 percent of individuals who endorse low closeness and warmth with both their mothers and fathers (Russek & Schwartz, 1997a). Moreover, these effects are independent of the participants' marital history, smoking history, or disease history in the family, suggesting the unique significance of parental bonds on health outcomes (Russek & Schwartz, 1997a).

In addition to prospective studies, the research literature documents that continued attachment to parents is predictive of the stress response in college samples (McCarthy et al., 2006; McCarthy et al., 2001). In one study, college students who report better attachment to parents in adulthood show lower levels of perceived stress, lower usage of repression to manage their feelings, and greater expected ability to manage their emotional functioning (McCarthy et al., 2001). In another study, McCarthy and colleagues (2006) report that undergraduates' continued attachment to parents in college predicts higher expectations of coping and mood regulation. In turn, these higher expectations predict lower stress outcomes. In particular, undergraduates with stronger parental attachment show lower levels of distress than undergraduates who report poorer parental attachments. Similarly, another study indicates that family functioning (i.e., parental attachment, parental flexibility, family cohesion) predicts undergraduates' self-reported coping resources and mood-regulation expectancies (McCarthy, Lambert, & Seraphine, 2004). Together with the previously discussed research, these findings suggest that attachment in childhood, adolescence, and emerging adulthood may be an innate tendency that predicts stress/health outcomes.

Punishment. Punishment also is related to stress/health in both animals and humans. In studies of the rat, punishment has a significant impact on stress/health during coping behaviors (Weiss, 1971b, 1972). Weiss placed groups of three rats in an experimental condition in which one rat is able to avoid a buzzer-cued electric shock by turning a wheel (i.e., the rat is operantly trained), one rat is connected to the electrodes of the operantly trained rat so that it receives identical shock but has no control over it (i.e., the rat is a yoked control), and one rat receives no shock but is able to hear the buzzer sound (i.e., the rat serves as a control). Weiss reports that operantly trained rats have less stress and fewer stomach ulcerations than yoked controls, indicating that predictability and/or the use of a coping response reduces the stress response. He is able to reverse this trend, however, simply by punishing the operantly trained rats with a brief shock whenever they turn the wheel (Weiss, 1971b). In other words, operantly trained rats are able to avoid the long train of shocks by turning the wheel but receive a short shock for performing this coping behavior. Compared to yoked control rats, who are receiving identical shock but are helpless to affect the situation, operantly trained rats have significantly more stress and ulcerations. Thus, shock produces significantly more stress when it is used as the punishment of a coping response, as with the operantly trained rats, than when it is administered independent of the animals' behaviors, as with the yoked controls. Weiss (1971b) concludes that creating conflict about coping responses or punishing a coping response is more stress inducing than a stressor of equivalent intensity that is not associated with attempts to cope.

Regarding punishment in humans and parenting, severe punishment in the form of child abuse is known as a detriment or stressor for health and physiological development (Carrey,

Butter, Persinger, & Bialik, 1995). Even beyond outright abuse, harsh parenting is associated

with higher distress and heart rates in inner-city children (Krenichyn, Saegert, & Evans, 2001).

Specifically, children who experience low exposure to community violence (ECV) and less harsh

parenting show lower levels of systolic blood pressure (SBP) and diastolic blood pressure (DBP).

Furthermore, parenting behaviors moderate the relationship between ECV and blood pressure in

these children (Krenichyn et al., 2001). It should be noted, however, that harsher parenting also

is related to lower blood pressure only in harsher environments (Krenichyn et al., 2001). It may

be the case that fit plays an important role, with harsher parenting being more adaptive in harsher

environments and more supportive parenting being more adaptive in less demanding

environments.

Experimental studies also support the significance of punishment in the stress/health

outcomes of children and adolescents. Foster parents who receive parent skills training display

decreased levels of punishment and, in turn, have foster children who exhibit decreases in their

behavior problems and physiological stress responses (Fisher et al., 2000). In this study, the

foster parents who receive parent skills training are caring for children identified as extremely

disruptive and aggressive. The improvements in child behavior problems and cortisol levels are

significantly greater than those of both community controls and foster children who are less

disruptive and aggressive. Moreover, foster children from the *un*treated families show *in*creases

in behavior problems and cortisol levels across the 3-month study, whereas the treated cohort

show decreases (Fisher et al., 2000). Although other parenting skills (e.g., consistency,

reinforcement of positive behaviors) are improved as well, the decline in punitive behaviors

generally is accepted as an important component of effective parenting and improved parent-child relationships (Barkley, 1987; Patterson, DeGarmo, & Forgatch, 2004). Integrating the research on animals and humans, it may be the case that parents who use punishment as a method of teaching and discipline are increasing children's stress by punishing what are attempts, albeit undesirable attempts, at coping on the part of these children. In other words, parents who punish children's behavior harshly may create more stress in their children than do unpredictable negative events because children feel punished as a result of their attempts to cope.

    Consistency. As noted above in the studies by Weiss (1972) and Fisher and colleagues (2000), consistency and predictability are key components in reduced stress responses. In particular, the consistency and predictability of aversive stimulation (i.e., shock) signaled by a warning buzzer significantly reduce stress and ulceration in rats (Weiss, 1971a). Likewise, parents who are consistent in providing discipline and positive reinforcement have foster children who exhibit improved behavior and lower cortisol levels (Fisher et al., 2000). Unfortunately, punishment often is assessed along with consistency in the parenting literature under the umbrella of general control by parents (Locke & Prinz, 2002). This combination may confound these two variables even though these variables possibly may have opposing effects on stress; punishment likely increases stress, whereas consistency likely reduces stress. As a result, consistency and punishment are differentiated more clearly in the current study by using separate subscales for punishment and consistency as parental behaviors.

    With regard to the studies conducted on parental consistency, consistency is related to reduced stress, increased effective parenting, and improved relationships between parents and

their children. For instance, as part of a study on marital discord, Gottman and Katz (1989) report that parenting with less structure or consistency (i.e., disorganization, low limit setting) is related to increased anger, noncompliance, and stress-related hormones as well as poorer health in children. In addition to these correlational studies, experimental research demonstrates that improving consistency as part of a parent skills program leads to reduced stress in troubled children as compared to controls whose parents do not receive training (Fisher et al., 2000). Finally, in synthesizing empirical studies, researchers conclude that consistency is an important aspect of effective parenting and improved parent-child relationships (Barkley, 1987; Patterson et al., 2004) and, thus, may improve parent-child attachment.

Positive Parenting and Involvement. A lack of punishment and the presence of consistency may not be sufficient to establish positive relationships between parents and their children or to induce positive health outcomes in children, however. Positive behaviors and parental involvement also may be necessary. In research studies, these two constructs (i.e., positive parenting and involvement) often include behaviors such as soothing, assistance, supportiveness, and praise (Locke & Prinz, 2002). In addition to contributing to positive relationships, positive parenting and involvement increases experiences of mastery as well as perceptions of self-worth in children (DeHart, Pelham, & Tennen, 2006; McClelland & Pilon, 1983; Rosen & D'Andrade, 1959; Wissink, Dekovic, & Meijer, 2006). In turn, mastery and self-worth are important cognitive variables in longitudinal predictions of positive stress/health outcomes (Hudd et al., 2000; Surtees, Wainwright, Luben, Khaw, & Day, 2006; Trzesniewski et al., 2006).

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Several studies demonstrate that positive parenting and involvement reduce stress and increase health in children. For instance, maternal soothing is related to the stress responses in 37 infants who were 3-months of age (Braarud & Stormark, 2006). In particular, infants whose mothers soothe them prior to an injection show stable cortisol levels pre- and post-injection, whereas infants whose mothers soothe them after they become distressed show increased cortisol following an injection (Braarud & Stormark, 2006). Another study shows that maternal responsiveness is related to lowered stress in infants ranging in age from 5- to 6-months (Haley & Stansbury, 2003). As part of this research, infants are exposed to a social challenge in which parents face their children but remain expressionless (i.e., the Still Face Procedure). Infants whose parents are generally more responsive regulate heart rate and negative affect more effectively than infants whose parents are less responsive (Haley & Stansbury, 2003). Conversely, parenting that is low in supportiveness (i.e., cold and unresponsive) is linked to higher levels of stress hormones in children (Gottman & Katz, 1989), and negative parenting (i.e., high in conflict and negative affectivity) is related to greater cardiovascular reactivity, cortisol reactivity, and self-reported stress responses (Ballard et al., 1993; Granger et al., 1998).

In addition to correlational studies, experimental designs demonstrate that increasing parents' positive reinforcement leads to decreased stress responses in children. As mentioned earlier, one study indicates that parent training that increases the use of positive reinforcement with highly disruptive and aggressive foster children reduces problem behaviors and cortisol levels in these children (Fisher et al., 2000). It may be the case that bi-directional effects (e.g., child temperament also influencing parental behaviors and stress) explain the findings for

parental behaviors and outcomes for children and adolescents. These findings by Fisher and colleagues (2000), however, support the importance of parents, beyond that of child temperament, in improving stress outcomes. Although the current study did not examine bi-directional effects, examining which parental behaviors are most important in stress/health outcomes for adolescents will further the understanding of potential mechanisms for promoting more positive stress/health outcomes in adolescents and improving the focus of parenting interventions.

Cognitive Factors in Stress/Health

Given the importance of cognitive variables in stress/health, researchers also try to uncover the specific cognitive mechanisms by which threat may be perceived and stress may be maintained. This line of research suggests that stress/health can be predicted from primary and secondary appraisals, general self-efficacy, and perseverative thinking. In the current study, it is hypothesized that these cognitive variables will mediate the relationship between parental behaviors and adolescents' stress/health. In other words, it is believed that parental behaviors will predict adolescents' appraisals, self-efficacy, and perseverative thinking. In turn, these cognitive variables will predict adolescents' stress/health. These cognitive variables are described in further detail in the following sections.

Situation-Specific Appraisals and Outcome Expectancies

A growing body of theories and research suggests that the most important psychological component leading to the stress response is cognitive appraisal (Eriksen et al., 2005; Folkman et al., 1986; Lazarus & Folkman, 1986; Ursin & Eriksen, 2004). In particular, individuals' evaluation of threat (i.e., primary appraisal) and ability to cope with the threat (i.e., secondary appraisal) are related significantly to the stress response (Folkman et al., 1986; Lazarus & Folkman, 1986). One study of 81 men indicates that primary and secondary appraisals of stress account for 35 percent of the variance in their physiological stress response to the Trier Social Stress Test (Gaab, Rohleder, Nater, & Ehlert, 2005). Thus, cognitive appraisals predict the intensity of the stress response and health outcomes by governing whether individuals interpret situations as stressful.

Primary and secondary appraisals also are related to the particular stress/health variables (i.e., blood pressure reactivity and poorer health outcomes) of investigation in this study (Gallagher et al., 2002; Tomaka, Blascovich, Kelsey, & Leitten, 1993). For example, individuals who appraise a stressor to be high in threat and low in challenge show the highest diastolic blood pressure (DPB) reactivity and the most increases in negative affect (Maier, Waldstein, & Synowski, 2003). Likewise, women who rate the threat of breast cancer as low upon initial diagnosis (i.e., primary appraisal) and their ability to cope as high (i.e., secondary appraisal) have better psychological functioning and lower disease progression than women with more pessimistic appraisals two- to six- months after diagnosis (Gallagher et al., 2002). Even in children, appraisal of threat from marital discord is a vulnerability factor in the relationship

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between marital discord and stress/health as measured by cardiovascular reactivity and total health problems (El-Sheikh & Harger, 2001).

There may be some restraints on the relationship between cognitive appraisals and stress/health outcomes, however. For example, research indicates that the relationship between cognitive appraisals and the stress response is time dependent. One study reports that anticipatory appraisals regarding a stressor account for the variance in stress responses, whereas retrospective appraisals do not (Gaab et al., 2005). This finding suggests that outcome expectancies, rather than any final or post-stressor appraisal of the situation, are the most important predictors of the stress response. The importance of expectancy may explain why some studies find weak correlations between cognitive appraisals and cardiovascular reactivity (Korunka, Zauchner, Litschauer, & Hinton, 1997). These studies rely on post-coping appraisals of stressors rather than pre-coping appraisals and, therefore, do not assess expectancies. Thus, measuring the effect of cognitions on cardiovascular response needs to be conducted prior to the stressor (anticipatory) so that participants' expectancies are assessed.

Incorporating findings on the importance of anticipation and expectancy, Ursin and Eriksen (2004) clarify the scope and importance of cognitive appraisal in their Cognitive Activation Theory of Stress (CATS). They suggest that, when the environment or internal states are different from what individuals expect, their bodies' alarm system (i.e., stress) is activated. The intensity of the alarm and the unpleasantness of the alarm (i.e., distress) depend on individuals' expectancy that *positive outcomes* will result from their efforts to cope (i.e., outcome expectancy). Thus, this theory suggests that the important aspect of appraisals is the expectancy

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of positive *outcomes* beyond the appraisal of the ability to employ a coping response (Ursin & Eriksen, 2004). The authors of CATS also claim that this theory reconciles the debate regarding whether emotion-focused coping or problem-focused coping is most effective. Based on their research, the coping strategy that is used is not important; instead, what is important is whether the individual believes that the coping strategy will lead to a positive outcome that accounts for a reduction in stress (Eriksen et al., 2005; Ursin & Eriksen, 2004). The authors state that "it is an essential element of CATS that only when coping is defined as positive outcome expectancy does the concept predict relations to health and disease" (Ursin & Eriksen, 2004, p. 567).

The CATS theory also asserts that coping responses do not need to be employed for stress to be reduced. For instance, novice parachute jumpers report less stress and have lower endocrine stress responses when they believe that their ability to perform the jump following training will lead to successful outcomes, even before they attempt the jump (Ursin, Baade, & Levine, 1978). Finally, the influence of cognitive variables may be a relatively universal phenomenon, as such a relationship is documented in several countries and various cultures (Florian, Mikulincer, & Taubman, 1995; Gaab et al., 2005; Punamaki, 1986; Ursin et al., 1978; Ursin & Eriksen, 2004).

In addition to theoretical and correlational findings, research using experimental designs documents that changing cognitive appraisals can produce improvements in stress/health. For example, children who are trained in cognitive-behavioral coping techniques prior to an invasive lumbar procedure show lower heart rates at needle insertion and report decreased subjective distress (Walco et al., 2005). Likewise, a review of intervention (experimental) research shows

that changing cognitive appraisals (i.e., primary and secondary appraisals) leads to better stress/

health outcomes in children with medical difficulties (Bisignano & Bush, 2004). Thus, the

literature suggests that there may be a causal path between changes in cognitive appraisals and

improved stress/health outcomes. In other words, cognitive appraisals are not simply an indicator

of stress level but are influential and modifiable mechanisms in the onset of stress.

General Self-Efficacy, Optimism, and Locus of Control

Adding to the importance of cognition in the stress response, some studies look beyond

cognitive appraisals in specific stressful situations and examine more global schemas and beliefs

that may be related to individuals' interpretations of stress across many situations. One such

belief, self-efficacy, is defined as the belief that one has the ability to manage situations using

certain behaviors (Bandura, 1982). Ursin and Erikson (2004) even suggest that the CATS

concept of positive outcome expectancy is identical to self-efficacy when self-efficacy becomes

generalized across several domains of ability. This sense of self-efficacy stems from learning and

mastering a response that reduces stress or leads to a certain goal (Ursin & Eriksen, 2004). In

animals, this mastery of coping responses can become so effortless that the stress response can

be nearly eliminated (Coover & Ursin, 1973; Ursin & Eriksen, 2004; Weiss, 1971a).

A related concept, locus of control (LOC), is defined as individuals' belief that the

outcome of an event is influenced either by the individuals themselves, known as internal LOC,

or by factors outside themselves, known as external LOC (Rotter, 1975). Locus of control is a

nearly identical construct to self-efficacy (Judge, Erez, Bono, & Thoresen, 2002), as both of

these constructs may represent positive outcome expectancy as described in CATS (Ursin &

Eriksen, 2004). In fact, one measure of LOC forces participants to choose between statements of internal versus external control. This measure is worded such that endorsing internal LOC items also implies a belief in positive outcomes (Carver, 1997). Conversely, the external LOC items are worded such that endorsing them does not imply confidence in outcome expectancies (Carver, 1997). Thus, findings from studies using this common LOC measure may be providing information on outcome expectancies rather than LOC as it is intended. Specifically, the relationship between an internal LOC and decreased stress may reflect a relationship between positive outcome expectancies and a decreased stress response due to confounds in the wording of the LOC measure.

A third construct, optimism, may be related especially to the CATS notion of positive outcome expectancy. In particular, many definitions of optimism state that it is, in fact, a positive outcome expectancy (Karademas, 2006). Research notes that optimism is correlated with both mental and physical well-being (Ironson & Powell, 2005; Karademas, 2006). In addition, prospective research demonstrates that optimism predicts physical health at two-year follow-up (Achat, Kawachi, Spiro, DeMolles, & Sparrow, 2000). Among 659 veterans, higher levels of dispositional optimism predict increased perceptions of physical and mental health and decreased levels of physical pain, independent of scores on measures of depression (Achat et al., 2000). Whether the construct is labeled as optimism, locus of control, or self-efficacy, it is related to health outcomes in most studies. It is still unclear, however, whether the more stable, generalized construct of positive outcome expectancy is a better predictor of differences in the stress response relative to situation-specific expectancies and appraisals of stress. Research regarding

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the relative importance of situation-specific appraisals versus global dispositions is addressed next.

Findings are mixed regarding the contribution of overall self-efficacy, optimism, and locus of control versus the contribution of situation-specific appraisals to stress/health outcomes. For instance, in a study of individuals with acute and chronic illnesses, self-efficacy and external LOC moderates psychological distress, with higher self-efficacy predicting lower endorsed distress (Shelley & Pakenham, 2004). On the other hand, one study finds that situation-specific appraisals of stressors account for significant variance (35%) in the cortisol stress response, whereas more global, stable beliefs in efficacy contribute weakly (Gaab et al., 2005). Other studies support that there is a relationship between global efficacy beliefs and lower cortisol and cardiovascular stress responses. For instance, a study of self-enhancing beliefs (i.e., individuals' positive illusions about their own efficacy) indicates that increased endorsement of individuals' positive abilities (i.e., efficacy) is related to lower levels of baseline cortisol, lower cardiovascular reactivity, and faster cardiovascular recovery (Taylor, Lerner, Sherman, Sage, & McDowell, 2003). These self-enhancing statements may be related closely to optimism, self-esteem, mastery, and generalized coping appraisals (Taylor et al., 2003), again suggesting the importance of underlying cognitive processes in the stress response.

It may be the case that some of the cognitive variables mediate each other, as one study in Israel indicates (Florian et al., 1995). This study of military recruits reveals that individuals' belief in control over the events occurring in their lives predicts mental health and distress at the end of a four-month military training (Florian et al., 1995). This effect is mediated by more

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situation-specific appraisals of threat (i.e., primary appraisal) and of coping ability (i.e., secondary appraisal; Florian et al., 1995). Thus, it may be the case that global, stable outcome expectancies do influence situation-specific appraisals but that situation-specific appraisals are the key psychological determinant of the stress response. Research indicates that there is some stability across situation-specific appraisals regarding emotion-focused coping but that there is greater variability across situations regarding instrumental or problem-focused coping (Folkman et al., 1986). This variable relationship between global beliefs and situation-specific appraisals may explain why some research suggests that global cognitive variables are predictive of the stress response (Shelley & Pakenham, 2004; Taylor et al., 2003), whereas other research does not (Gaab et al., 2005).

Perseverative Thinking

Situation-specific appraisals of threat and schemas of inefficacy may lead to increased allostatic load due to an increased frequency of the stress response. These cognitive variables, however, may not explain fully the mechanisms of prolonged activation of the stress response or allostatic load. Brosschot and colleagues (2005) argue that perseverative cognition, or ruminating about stressors, may be the mechanism leading to somatic and mental disease following perceived stressors. A review of the literature indicates that perseverative cognitions (e.g., rumination, worry, anticipatory stress) increase cardiovascular, immunological, and endocrinological markers of stress (Brosschot, Gerin, & Thayer, 2006). Specifically, research supports the importance of perseverative cognitions with the finding that emotional rumination is related to elevated cortisol levels in a sample of 51 adults (Roger & Najarian, 1998). Another

study, however, suggests that there is no significant difference between high and low ruminators in their physiological stress reactivity following the Trier Social Stress Test (Young & Nolen-Hoeksema, 2001). There is preliminary evidence, however, that the prolonged stress response may result from perseverative thinking about stressors. As Brosschot and colleagues (2005) state, there remains a need for more research in this area.

The Current Study

Research to date indicates that social (i.e., relationships) and cognitive (i.e., appraisals) variables are influential factors in the physiological stress response and in health outcomes (Dickerson & Kemeny, 2004; Uchino et al., 1996). Although genetics are influential in stress/health processes, current research is exploring controllable, epigenetic variables, such as social relationships and cognitive appraisals, in order to increase prevention and intervention efforts for disease processes (Carstensen, 1989; Gaab et al., 2005; Hanson et al., 1990; McCarthy et al., 2006; Parent et al., 2005; Ursin & Eriksen, 2004). In addition, researchers are focusing on child and adolescent development in stress/health outcomes due to findings that stress/health can be predicted from early social environments and can be detected by early physiological precursors (Kamarck et al., 1994; Krantz & Manuck, 1984; Sims, Hewitt, Kelly, & Carroll, 1986; Uchino et al., 1996).

As part of this focus on the development of children, adolescents, and emerging adults, research demonstrates that particular parental and cognitive variables, including parental behaviors as well as outcome expectancies and appraisals of stressors, are related to stress/health

outcomes at many points in time throughout development (El-Sheikh & Harger, 2001; Fisher et al., 2000; Gottman & Katz, 1989; McCarthy et al., 2001; Russek & Schwartz, 1997b; Walco et al., 2005). Given that these epigenetic factors interact with genetic expression and that early social variables appear to have long lasting effects on stress/health (Gunnar, 1987, 1998; Gunnar & Cheatham, 2003; Matthews et al., 1988; Parent et al., 2005), uncovering the most salient predictors of adolescents' stress/health appears to be an important task in the prevention and intervention process.

Despite the influential role that parents play in the cognitive, social, and health development of children, adolescents, and emerging adults, there is limited research on which parental behaviors are most important in their stress/health outcomes. In addition, there is limited research using path models to predict adolescents' stress/health outcomes or to determine whether adolescents' cognitions mediate the relationship between parental behaviors and adolescents' stress/health. As a result, the aims of the current study are 1) to examine which parental behaviors are most predictive of stress/health in adolescents, 2) to determine whether adolescents' cognitions mediate the relationship between parental behaviors and adolescents' stress/health, and 3) to establish a model explaining pathways of relationships among parental behaviors, adolescents' cognitive variables, adolescents' health behaviors, and adolescents' stress/health. The relationships explored in this study could be of particular clinical utility in determining which parental behaviors are the most important to address in improving the stress/health outcomes of children, adolescents, and emerging adults.

More specifically, this study explores the relationship between adolescents' stress/health outcomes and five parental behaviors, which include 1) positive parenting and involvement, 2) parents' use of corporal punishment, 3) parental consistency, 4) parental overprotection, and 5) poor parental monitoring. Adolescents' cognitions included situation specific appraisals of coping as well as global scores on self-efficacy, mood regulation, optimism, and perseverative thinking. Further, adolescents' physiological stress response was operationalized initially by measurements of blood pressure reactivity, which is linked to the stress response in previous research (Uchino et al., 1996). In addition, adolescents' perceived stress and overall health were operationalized initially by two self-report measures of general distress and their global degree of physical and mental ailments. Finally, adolescents' health behaviors were operationalized initially by a self-report measure of health behaviors (e.g., diet, sleep, drug use, exercise).

Regression analyses are used to determine which parental behaviors are most predictive of adolescents' stress/health outcomes. These analyses were run separately for the mother-adolescent relationship and the father-adolescent relationship based on adolescents' self-reported perceptions of their parents' behaviors throughout their childhoods. Although there is little research regarding which parental behaviors are the most significant predictors of adolescents' stress/health outcomes, it is hypothesized that parental involvement and warmth will account for the most variance in adolescents' stress/health in the regression analyses.

The pathways of influence between parental behaviors, adolescents' health behaviors, and adolescents' stress/health outcomes, as well as the possible mediation effects of adolescents' cognitions, are explored through the use of structural equation modeling. The hypothesized

model of the relationships examined in this study is depicted in Figure 1. Models were run separately for the mother-adolescent relationship and the father-adolescent relationship based on adolescents' self-reported perceptions of their parents' behaviors throughout their childhoods. It is hypothesized that parental behaviors will predict significantly adolescents' stress/health outcomes, even when accounting for adolescents' health behaviors. It also is hypothesized that more positive parenting will predict more adaptive cognitions in adolescents and that more adaptive cognitions will predict better outcomes on stress/health measures. Finally, it is hypothesized that adolescents' cognitions will mediate the relationship between parental behaviors and adolescents' stress/health outcomes in path analyses. If mediation effects are found, clinicians would be better informed regarding the mechanisms that should be addressed when attempting to prevent negative stress/health outcomes from developing or treating individuals at risk for stress and negative health outcomes.

CHAPTER TWO: MATERIALS AND METHODS

Participants

Participants were 181 18- to 20-year olds from a Southeastern state university. Individuals in this age range were recruited because they fall within the late adolescent age range and continue to be influenced by their attachment to their parents (Baumrind, 1991; McCarthy et al., 2001; Renk, Roberts, Klein, Rojas-Vilches, & Sieger, 2005). In addition, research indicates that this age group resembles younger adolescents of previous generations in their financial, social, and emotional dependence on their parents, as it is expected in today's culture that adolescents will proceed through a lengthier educational and social development (Furstenberg, 2006). Furthermore, individuals in this age range show significant increases in health problems (Furstenberg, 2006), which is a primary issue for this study.

Adolescents were recruited from undergraduate psychology classes in exchange for extra credit or study participation credits toward a psychology class of their choosing. Participation was not limited by gender, ethnicity, or other demographic characteristics, with the exception that adolescents had to fall within the age range of 18- to 20-years. It should be noted that participants were not excluded from the data analyses conducted for this study if they did not provide responses regarding one of their parents, as not all participants had two parents present during their childhoods. Participants were excluded from data analyses for other reasons,

however. Five participants withdrew early from the study, and four participants did not provide answers to more than five of the survey questions regarding their cognitions. Eleven participants were excluded because they answered more than two of the validity questions incorrectly (see the *Measures* section below for a detailed description of the validity questions). Finally, one participant whose blood pressure reactivity showed a changed of 90 points was excluded as an outlier.

Therefore, 160 participants (114 females and 46 males) provided complete data that passed the validity checks used for this study. This sample size was deemed to be sufficient, as power analyses suggested that 140 adolescents would be needed to provide adequate power for both the multiple regression analyses and the path analyses that were conducted as part of this study. For multiple regression, the sample size of 160 exceeded Cohen's (1992) recommendations. Specifically, with an alpha level of .05 and a medium effect size, 107 participants were required to assess the predictive value of five parental behaviors in a regression analysis at a power of .80. For path analyses, Kline (1998) suggests that a ratio of 20 participants per indicator is good, 10 participants per indicator is fair, and 5 participants per indicator is poor. Thus, for 14 indicators (i.e., those indicators that remained after excluding some of the parental behaviors from this study due to poor fit with their initially hypothesized latent constructs), 160 participants can be considered an adequate sample size for path analysis.

For the participants (age: $M = 18.44$-years, $SD = 0.71$-years) who were retained for data analyses, the majority of these participants self-reported their racial background to be Caucasian (67.5%), with the remainder of the sample varying in their racial background (i.e., African

American [13.1%], Asian American [3.8%], biracial [4.4%], Indian [1.3%], and some other background [10.0%]). The participants also varied in their class standing, with 73 percent indicating that they were freshmen, 18 percent indicating that they were sophomores, 7 percent indicating that they were juniors, and 2 percent indicating that they were seniors. Based on their self-reports of health behaviors, these participants sleep 7.5 hours per night on average ($SD =$ 1.22 hours) and exercise an average of 54 minutes per day ($SD = 57.18$ minutes). In addition, 45 percent of the participants currently live with one or both of their biological parents, 2 percent live with another relative or caregiver, and 53 percent live alone.

In general, these participants reported having more contact with their mothers than their fathers. Regarding average daily interactions with mothers, 45.0 percent of participants interact with their mothers 0 to 30 minutes per day, 23.1 percent interact 30 to 60 minutes per day, 13.8 percent interact 1 to 2 hours per day, 7.5 percent interact 2 to 3 hours per day, and 6.3 percent interact 4 or more hours per day. Regarding average daily interactions with fathers, 62.5 percent of participants interact with their fathers 0 to 30 minutes per day, 18.1 percent interact 30 to 60 minutes per day, 5.0 percent interact 1 to 2 hours per day, 6.3 percent interact 2 to 3 hours per day, and 3.1 percent interact 4 or more hours per day. Participants' also reported that their parents' education levels varied. For mothers, 1.3 percent had not completed high school, 15.0 percent had a high school degree, 18.7 percent had a vocational certificate or some college, 46.9 percent had an Associate's or Bachelor's degree, 14.4 percent had a Master's degree, and 3.1 percent had a Doctoral degree; education levels were not reported for mothers by .6 percent of participants. For fathers, 1.3 percent had not completed high school, 23.1 percent had a high

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school degree, 13.8 percent had a vocational certificate or some college, 41.3 percent had an

Associate's or Bachelor's degree, 11.9 percent had a Master's degree, and 6.9 percent had a

Doctoral degree; education levels were not reported for fathers by 1.9 percent of participants.

Parents of these participants also were invited to complete 30-minutes of online surveys

in exchange for $50 worth of coupon certificates to national stores and restaurant chains. Only

twenty-three parents completed these online surveys, however. As a result, parent data for many

of the measures used in this study (i.e., the Locke-Wallace Marital Adjustment Test, the Parents'

Rating Scale of Child's Actual Behaviors, the Parental Bonding Instrument, the Alabama

Parenting Questionnaire, the Perceived Stress Scale, and the 12-Item Short-Form Health Survey)

are not included in the data analyses due to this insufficient sample size.

Two-tailed t-tests revealed that there were significant differences on four of the study

variables between participants whose parents completed surveys and those whose parents did

not. Participants whose parents completed surveys reported significantly lower levels of

situational stress on the adjusted SAM scale ($M = 38.17$, $SD = 9.41$) than those whose parents

did not participate ($M = 43.69$, $SD = 9.83$), $t(158) = -2.26$, $p < .03$. Likewise, participants whose

parents completed surveys reported significantly lower levels of overall perceived stress on the

PSS ($M = 18.89$, $SD = 5.38$) than participants whose parents did not complete surveys ($M =$

21.97, $SD = 6.28$), $t(158) = -1.99$, $p < .05$. In addition, participants whose parents completed

surveys reported significantly more global self-efficacy on the GSE scale ($M = 34.50$, $SD = 2.33$)

than those whose parents did not ($M = 32.69$, $SD = 3.48$), $t(158) = 2.14$, $p < .03$. Finally,

participants whose parents completed surveys reported higher optimism on the LOT-R scale (M

= 18.56, *SD* = 3.38) than those whose parents did not (*M* = 16.09, *SD* = 3.77), *t* (158) = 2.64, *p* <

.009. In summary, participants whose parents completed surveys had more adaptive levels of

situational and global stress, optimism, and general self-efficacy according to their own

endorsements on the study surveys.

<div align="center">*Measures*</div>

Validity Measures

  Screening for Random Responding. Adolescents completed survey items designed to

detect a random or quick response style. Ten statements were interspersed throughout the survey

measures and consisted of statements such as "Select number two as your response to this item"

and "On this item, select strongly agree as the answer." The statements were worded differently

throughout the packet of questions so that they were consistent with the Likert scales of adjacent

survey questions and were matched in length and format to adjacent survey questions.

Participants who endorsed more than two responses that were inconsistent with the directions of

these validity screening items were excluded from the data analyses conducted for this study.

Parental Behaviors

  Parental Bonding Instrument (PBI). Adolescents completed the PBI, the most widely

used survey of parenting styles (Enns, Cox, & Clara, 2002), as a measure of their perceptions of

parental nurturance (i.e., Parental Care and Overprotection; Locke & Prinz, 2002; Parker,

Tupling, & Brown, 1979). These subscales from the PBI serve as indicators of the *Parental*

Behaviors latent variable for the structural equation models tested in this study. The PBI consists

of 25 items rated on a Likert scale of one to four. This measure is used generally to assess the

parenting styles used with children and adolescents up to the age of 16-years (Parker et al., 1979;

Wilhelm, Niven, Parker, & Hadzi-Pavlovic, 2005). A retrospective version of this instrument can

be administered to adults and was utilized in this study. The concurrent validity of the PBI is

supported by strong associations with other parenting instruments (Locke & Prinz, 2002). The

internal consistency coefficients of the PBI subscales ranged from .87 to .94 in a previous study

(Mackinnon, Henderson, & Duncan-Jones, 1989), and the split-half reliabilities of the PBI

subscales ranged from .74 to .88 in previous studies (Locke & Prinz, 2002). Finally, longitudinal

studies indicate that scores on the PBI are stable over a 20-year period and are independent of

mood states and life experiences (Wilhelm et al., 2005). In the current study, the Overprotection

scale has a Cronbach alpha of .88 for reports of mothers and .87 for reports of fathers. The Care

scale has a Cronbach alpha of .92 for reports of mothers and .93 for reports of fathers.

     Alabama Parenting Questionnaire (APQ). Adolescents completed the child version of the

APQ as a measure of the parental behaviors of their mothers and fathers. Adolescents completed

the APQ separately regarding their mothers and their fathers. The subscales from the APQ serve

as indicators of the Parental Behaviors latent variable. The APQ consists of 42 items rated on a

5-point frequency rating scale. These items produce six subscales describing parental behavior

(Shelton, Frick, & Wootton, 1996). The APQ has acceptable criterion, convergent, and

discriminant validity in a previous study (Locke & Prinz, 2002). The child version was designed

for use with children through the age of 13-years; however, this version has limited accuracy

with child reports (Shelton et al., 1996). The APQ has been used successfully in assessing adolescents through the age of 18-years, as inaccurate responders tend to be younger rather than older children (Magoon & Ingersoll, 2006).

The Positive Parenting subscale assesses the encouragement and reinforcement that parents provide (e.g., praising children for good behavior). It has an internal consistency of .80 for the parent version and .74 for the child version in a previous study (Shelton et al., 1996). The Involvement subscale assesses the helpful and friendly time that parents spent with their children (e.g., assisting with homework, playing games, driving children to their activities). In a previous study, this subscale has an internal consistency of .80 for the parent version, .72 for the child version regarding mothers, and .83 for the child version regarding fathers. The Positive Parenting and Involvement subscales are correlated highly and may be measuring the same underlying construct (Shelton et al., 1996). Similarly, in the current study, they are correlated highly. As a result, items from both subscales were summed to create one Positive Parenting/Involvement subscale. In the current study, this composite subscale has a Cronbach alpha of .91 for responses regarding mothers and .90 for responses regarding fathers.

The Inconsistent Discipline subscale measures parental follow-through during discipline and the consistency of discipline (e.g., parents not changing discipline as a result of their mood). Research indicates that this subscale has an internal consistency of .67 for the parent version and .56 for the child version (Shelton et al., 1996). In the current study, analyses of internal consistency resulted in a Cronbach alpha of .70 for responses regarding mothers and .64 for responses regarding fathers.

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The Corporal Punishment subscale assesses the frequency of hitting or spanking as part of the discipline that parents use. This subscale has an internal consistency of .46 for the parent version and .44 for the child version in a previous study (Shelton et al., 1996). Despite the low internal consistency, this subscale still contributes significantly to discriminating children with conduct problems from those who do not exhibit such problems, suggesting its clinical and research usefulness. The low internal consistency of this subscale may be related to its small number of items (i.e., three items) that assess three different, and possibly unrelated, physical punishments (i.e., spanking, slapping, and the use of other objects for hitting). As a result, four additional items were added to this subscale regarding different types of physical punishment. The additional items, which were created specifically for the current study, include the following statements: 1) Your mother/father would smack your hand if you misbehaved, 2) If you misbehaved, your mother/father would swat you on the bottom, 3) Your mother/father would use physical punishment to let you know when you had misbehaved, and 4) Your mother/father would use a nearby object to hit you as a punishment. In the current study, analyses of internal consistency of this expanded corporal punishment scale resulted in a Cronbach alpha of .89 for responses regarding mothers and .88 for responses regarding fathers.

The Poor Monitoring/Supervision subscale assesses the degree to which parents supervise their children and know the whereabouts of their children. This subscale has an internal consistency of .67 for the parent version and .69 for the child version in a previous study (Shelton et al., 1996). In the current study, the Poor Monitoring/Supervision subscale has a Cronbach alpha of .82 regarding mothers and .81 regarding fathers.

Finally, the Other Discipline Practices subscale of the APQ was not included in this study. It was not a planned part of the analyses for this study because it does not have clear empirical relationships with stress/health variables. The Other Discipline Practices subscale assesses non-physical methods for disciplining children, such as using time-out, removing privileges, and ignoring negative attention-seeking behavior.

Cognitive Variables

Stress Appraisal Measure (SAM). Adolescents completed the SAM as a measure of their subjective, situation-specific perception of stress (Peacock & Wong, 1990). A total score derived from the SAM (as described below) is used as an indicator of the *Adolescent Cognitions* latent variable. The SAM consists of 28 items rated on a 5-point Likert scale. The items can be used to derive three independent dimensions of specific appraisals of a particular stressor, including primary appraisal, secondary appraisal, and stressfulness. The particular stressor in this study was the Trier Social Stress Test (described below). The Primary Appraisal subscales on the SAM are Threat, Challenge, and Centrality (or the perceived importance of the stressor), whereas the Secondary Appraisal subscales on the SAM are Control-Self, Control-Others, and Uncontrollable. Further, the Stressfulness scale assesses overall feelings of distress and does not have lower-order subscales (as noted for the other scales on the SAM). The SAM has support for both theoretical and psychometric validity (Maier et al., 2003). Measures of internal consistency for the SAM also are adequate, with Cronbach alphas ranging from .65 to .86 in previous studies (Maier et al., 2003; Peacock & Wong, 1990). Furthermore, factor analysis indicates that the six subscales related to Primary and Secondary Appraisals are independent dimensions, with Threat

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and Challenge each accounting for unique variance in the stressfulness of a situation (Maier et al., 2003; Peacock & Wong, 1990).

In the current study, adolescents' perceptions of the stressful situation in the Trier Social Stress Test was of interest, as opposed to Primary or Secondary Appraisals. As a result, a total SAM score was created in which the coping-oriented scales were reverse scored so that a higher total SAM score indicates higher perceptions of threat, stressfulness, and an inability to cope (i.e., the Centrality and Controllable-by-Others items were not used in this score). In calculating this score, it was discovered that several participants failed to complete five of the items from the SAM, likely because these items did not apply to the stress task that the participants completed in the current study. For example, "Is there someone or some agency I can turn to for help if I need it?" may have been difficult to answer because the participants were not given time to contact a friend or support member in the stress task completed in this study. As these items did not appear to be pertinent to the stress task completed in this study, these items were not used in the calculation of the total score described above. Analyses of internal consistency resulted in a Cronbach alpha of .88 for this adjusted SAM scale.

Negative Mood Regulation Scale (NMRS). Adolescents completed the NMRS as a measure of their outcome expectancy and emotional self-efficacy regarding regulation of negative moods (Catanzaro & Mearns, 1990). The total NMRS score serves as an indicator of the *Adolescent Cognitions* latent variable. This score is composed of 30 items rated on a 5-point Likert scale. These items also produce three subscales: the Cognitive NMRS subscale measures expectancies that individuals can cope with negative moods using effective thoughts, the

Behavioral NMRS subscale measures expectancies that individuals can cope with negative moods using effective behaviors, and the General NMRS subscale measures expectancies that individuals will be able to cope with negative moods in some way. Measures for the internal consistency and temporal stability of the NMRS are adequate in a previous study, with Cronbach alphas ranging from .86 to .92 and test-retest reliabilities ranging from .67 to .78 across a 6- to 8-week interval (Catanzaro & Mearns, 1990). The NMRS has discriminant validity from social desirability, as its correlation with the Social Desirability Scale range from $r = .09$ to $r = .17$ in a previous study (Catanzaro & Mearns, 1990).

In the current study, adolescents' current overall expectancies regarding their ability to regulate negative moods was of interest, as opposed to their ability to cope using either cognitive, behavioral, or other strategies. As a result, the total NMRS score was used. This score was the sum of all 30 items, calculated such that a higher score indicates greater expectancies of coping. In the current study, analyses of internal consistency resulted in a Cronbach alpha of .88 for this Total NMRS scale.

Life Orientation Test-Revised (LOT-R). Adolescents completed the LOT-R as a measure of their dispositional optimism, or generalized expectancies of positive and negative outcomes (Scheier, Carver, & Bridges, 1994). The total score from the LOT-R is used as an indicator of the *Adolescent Cognition* latent variable. The LOT-R consists of six target items rated on a 5-point Likert scale (the four filler items of the scale were not included), with a higher overall score indicating higher optimism. The internal consistency of the revised scale during the development study is .78, and the test-retest reliability is .79 over a 28-month interval. The original LOT,

which differs by three items, is superior in factor structure replicability when compared to the Revised Generalized Expectancy for Success Scale, the Hope Scale, and the Hunter Opinions and Personal Expectations Scale (Steed, 2002). In the current study, analyses of internal consistency resulted in a Cronbach alpha of .78 for the total LOT-R score.

The General Self-Efficacy Scale (GSE). Adolescents completed the GSE as a measure of their expectation that they can perform competently in a variety of areas (Scholz, Doña, Sud, & Schwarzer, 2002; Schwarzer & Jerusalem, 1995). The total GSE score is an indicator on the *Adolescent Cognitions* latent variable. The GSE was developed in Germany in 1979, and the original 20 items later were reduced to ten items and translated into English (Schwarzer & Jerusalem, 1995). These ten items are rated on a 4-point Likert scale, with higher scores indicating higher global self-efficacy. This measure has adequate internal consistency and temporal stability in a previous study, with Cronbach alphas ranging from .75 to .91 and test-retest reliabilities ranging from .55 to .75 across a one year interval (Scholz et al., 2002). The GSE has good convergent and predictive validity, and its utility in multiple cultures suggests that it is tapping into a common underlying phenomenon (Scholz et al., 2002). Of note, additional measures for self-esteem and locus of control are not used in this study because research suggests that they indicate the same core construct as measures of general self-efficacy (Judge et al., 2002). In the current study, analyses of internal consistency resulted in a Cronbach alpha of .83 for the total GSE score.

The Ruminative Response Scale-Abbreviated (RRS-A). Adolescents completed the RRS-A as a measure of their trait tendency to perseverate about difficulty with stressors (Butler &

Nolen-Hoeksema, 1994; Nolen-Hoeksema & Morrow, 1991). The total RRS-A score is an indicator of the *Adolescent Cognition* latent variable. The RRS-A consists of ten items rated on a 4-point Likert scale (Butler & Nolen-Hoeksema, 1994). Originally, the unabbreviated RRS was a subscale of the Response Styles Questionnaire, a measure of cognitive, behavioral, and affective responses to experiences of depression. The unabbreviated RRS subscale consisted of 31 items and was shortened to contain the ten items with the highest item-to-total correlations (these items became the RRS-A; Butler & Nolen-Hoeksema, 1994). An evaluation of the internal consistency of the new RRS-A resulted in a Cronbach alpha of .88 in a previous study. Furthermore, both the distraction and rumination subscales of this abbreviated version are associated significantly with aspects of distress (Flett, Madorsky, Hewitt, & Heisel, 2002). In the current study, analyses of internal consistency resulted in a Cronbach alpha of .88 for the total RRS-A score.

Stress and Health Measures

  The Perceived Stress Scale (PSS). Adolescents completed the PSS as a measure of their global appraised stress (Cohen, Kamarck, & Mermelstein, 1983). The PSS total score serves as an indicator of the *Adolescents' Stress/Health* latent variable. The PSS consists of 14 items rated on a 5-point Likert scale regarding the degree of distress and hassle resulting from problems in the past month. The internal consistency of the measure is adequate, with Cronbach alphas ranging from .84 to .86 in a previous study (Cohen et al., 1983). Support for the temporal stability of this measure is noted, with test-retest reliabilities ranging from .55 to .85 across a 6-week interval (Cohen et al., 1983). The PSS is a better predictor of health outcomes than the

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number and impact of life events (Cohen et al., 1983). In the current study, analyses of internal consistency resulted in a Cronbach alpha of .79 for the total PSS score.

The 12-Item Short-Form Health Survey (SF-12). Adolescents completed the SF-12 as a brief measure of their physical and mental health (Ware, Kosinski, & Keller, 1996). This measure serves as an indicator of the Adolescents' Stress/Health latent variable. The 12 items of the SF-12 produce eight subscales using norm-based scoring. These subscales include Physical Functioning, Role–Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role–Emotional, and Mental Health. The psychometric properties of the SF-12 are acceptable in previous studies. Support is noted for the temporal stability of the SF-12, with test-retest reliabilities ranging from .63 to .91 across all eight subscales over a 2-week interval (Ware et al., 1996). The intraclass correlation coefficient ranges from .75 to.84 in a study of online administration of the SF-12 (Lenert, 2000). Furthermore, the SF-12 accounts for 91 percent or more of the variance in SF-36 scores (i.e., a longer version of this health survey) for both physical and mental components (Ware et al., 1996). In the current study, the eight subscales of the SF-12 were averaged to create one overall scale of physical and mental health. Scores from each of these individual subscales were standardized and then averaged based on an equal weighting of each of the eight subscales. In the current study, analyses of internal consistency resulted in a Cronbach alpha of .79 for this total SF-12 scale.

Blood Pressure Reactivity to the Trier Social Stress Test (TSST). Adolescents' blood pressure was measured both prior to and following a psychosocial stressor, the Trier Social Stress Test (TSST; Kirschbaum et al., 1993). The TSST is a standardized protocol that is shown

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repeatedly to induce physiological and psychological increases in stress scores, with cardiovascular responses occurring in 70 to 80 percent of participants (Gaab et al., 2005; Hammerfald et al., 2006; Kirschbaum et al., 1993). The TSST consists of informing participants ten minutes prior to the task that they will have to present an impromptu speech to a panel of unknown individuals regarding suitability for a desired job as well as complete a mental arithmetic task aloud. For the purposes of this study, participants were asked to discuss their suitability for college. The standard protocol allows a preparation period of five minutes prior to the public speaking task. In the current study, a video camera that purportedly fed to a panel of judges was used instead of a live panel of judges. The impromptu speech and the mental arithmetic task each last for five minutes.

The adolescents' systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured according to methodology used in numerous studies of blood pressure reactivity (Ballard et al., 1993; El-Sheikh & Harger, 2001; Wright, Treiber, Davis, & Strong, 1993). Specifically, SBP and DBP were measured using an automated sphygmomanometer fitted to an appropriate sized arm cuff. To establish a baseline, blood pressure was measured every two minutes for 20 minutes while the participants were completing the online packet of surveys. Baseline measures did not begin until participants had been completing surveys for ten minutes to allow for acclimation to the laboratory setting and a return to baseline after walking to the laboratory. The baseline measures were averaged to produce one baseline score for each SBP and DBP. Blood pressure also was measured every two minutes during the preparation and execution of the TSST. The average of these blood pressure responses was calculated to produce

one blood pressure reaction score for each SBP and DBP. Blood pressure reactivity was calculated by subtracting the baseline score from the response score for each SBP and DBP (i.e., mean blood pressure after the stressor minus the mean blood pressure prior to the stressor). The SBP and DBP reactivity scores were meant to serve as indicators of the *Adolescents' Stress/Health* latent variable.

      The Adult Health Behaviors Questionnaire (AHBQ). Adolescents completed the AHBQ as a measure of their health behaviors. The AHBQ is a subsection of the National Health Interview Survey, which was developed by the National Center for Health Statistics to assess a variety of factors related to health (U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, & National Center for Health Statistics, 2004). The AHBQ assesses specific health behaviors and consists of 25 questions regarding cigarette use, sleep habits, alcohol use, body mass and height, and physical activity. The questions are answered in a variety of formats, including quantitative open-response, yes-no, and Likert scales (i.e., depending on the question). For instance, "Have you smoked at least 100 cigarettes in your entire life?" is answered using a yes-no format, whereas "How old were you when you first started to smoke fairly regularly?" is answered in a quantitative open-response format. Normative data on these health behaviors are provided by the U.S. Department of Health and Human Services, the Center for Disease Control, and the National Center for Health Statistics (2006) based on a sample of 31,000 adults. These types of health behaviors, including sleep habits, cigarette use, and physical activity, predict health outcomes significantly (Macera, Pate, & Davis, 1989; Schoenborn, 1986). Three scores were derived by combining three different domains of

questions, which included the drug-use questions, the exercise habits questions, and the sleep question. More specifically, the drug-use questions examine self-reports of alcohol and drug use; these questions were used to calculate an overall drug and alcohol use score. The exercise habits questions consisted of questions regarding the average length and frequency of daily aerobic and strengthening exercises; these questions were used to yield an average daily exercise score. The sleep question was a single numeric value reported by participants as their average hours of nightly sleep.

Demographic and Lifestyle Information

Adolescent Demographics. Adolescents completed a demographics measure regarding their age, sex, ethnicity, grade point average, and parental status (i.e., being raised by a single parent, biological parents, or a parent and stepparent). In addition, this questionnaire included questions regarding dietary habits to assess for nutritional influences on stress/health that were not assessed in the Adult Health Behaviors Questionnaire. These five dietary questions assessed negative eating habits, such as the consumption of fried foods. The adolescents' responses were combined into one eating habits score representing the number of meals consumed per week that contained unhealthy foods.

Procedure

After receiving Institutional Review Board (IRB) approval, students from undergraduate psychology classes were recruited to complete an online compilation of surveys and a laboratory

task in exchange for extra credit. Students signed up for a participation appointment using an online experiment-management system in the department of Psychology. The study was described as having online surveys as well as an oral component to the study. To control for extraneous influences on blood pressure readings, adolescents were asked to refrain from exercise, caffeine or alcohol consumption, and tobacco use in the three hours prior to the study. Upon arrival at the laboratory, participants reviewed and signed an informed consent form regarding the procedures of the study as well as a permission form to be contacted for further study. Next, they completed the SF-12, PSS, NMRS, LOT-R, PBI, APQ, GSE, and RSQ-A. These questionnaires were administered online via computers available in the data collection room in approximately one hour. Their baseline blood pressures were measured ten minutes after arrival and every two minutes for 20 minutes while they completed the online surveys.

Following the completion of their measures, participants were informed about the social and mental stressor tasks (the TSST) and completed the SAM survey regarding their appraisal of threat from the TSST. They then were given scratch paper and five minutes to prepare their speeches. Finally, they performed the TSST tasks (i.e., giving a five-minute speech regarding their suitability for college and counting backward in increments of 13 for five minutes). Their blood pressures were recorded every two minutes during the TSST portion of the study. Participants were provided the opportunity to receive assistance (if needed) throughout the experiment. In addition, participants whose blood pressures elevated or dropped into critically high or low ranges at any time during the session were referred immediately to the Student Health Center and/or signed a release of liability disclaimer if they chose not to go to the Student

Health Center. Such incidents with individuals' blood pressures occurred on seven occasions, and all seven participants chose to sign the release of liability disclaimer rather than go to the Student Health Center. At the end of the session, participants were provided with a debriefing form and were given the opportunity to receive information about the study. The debriefing form included a description of the purpose of the study, methods for receiving answers to concerns or questions about the study after leaving the data collection session, methods for obtaining counseling if desired, and how to contact the investigators about the study.

Upon completion of their part of the study, participants were provided with a flyer that invited their parents to complete online survey measures (or paper surveys, if they did not have internet access). The flyer also informed parents that a packet of coupons would be sent to them at a mailing address that they provided after completion of their part of the online survey. For the parents wishing to participate, they could log on to an online survey system (HostedSurvey) or contact the researchers for a paper packet. All parents used the online survey system, however. The online interface and the paper packets included a description of the study and informed consent forms including a voluntary question regarding permission to be contacted for future study. They received instructions for completing the surveys and methods for receiving assistance by phone (if needed). Upon completion of the surveys, parents were provided with the same debriefing form as provided to student participants and an opportunity to receive information about the study.

CHAPTER THREE: RESULTS

Using SPSS for Windows version 11.5, all data were screened for violations of the assumption of normality, outliers, missing data, linearity, and multicollinearity or singularity. SPSS was used to conduct the multiple regression analyses described below, and STATISTICA was used for the structural equation modeling/path analyses described below. Analyses were conducted at alpha levels of .05, unless otherwise noted. Although some of the measures showed a slightly skewed or kurtotic distribution (values > 1), only the scores on the AHBQ and demographics questionnaire (i.e., measures of health behaviors including sleep, diet, exercise, and drug/alcohol use) showed substantial skewness or kurtosis (values > 2). Although the scores on the health behaviors measures were skewed, the values that were reported appeared typical given the normative values (Racette, Deusinger, Strube, Highstein, & Deusinger, 2008; U.S. Department of Health and Human Services et al., 2006). As a result, these scores were retained for further examination in the planned data analyses for this study. Data screening revealed that, after removing cases with several omitted responses (n = 4), no case contained more than 5 omitted responses. Therefore, missing data points were replaced with the mean for endorsed items on each respective measure.

Multicollinearity and Singularity

After screening for multicollinearity across the measures used in this study, one score was removed from further consideration for the planned data analyses for this study because of their significantly high correlation with another measure. In particular, the Care scale from the PBI was excluded from further analysis to improve parsimony because it was related so closely to the combined Positive Parenting/Involvement scale from the APQ ($r = .77$ for mothers, $r = .77$ for fathers). The Care scale was removed, rather than the Positive Parenting/Involvement scale, because the Care scale was slightly skewed.

Descriptive Statistics

Analyses were conducted to examine the central tendency and dispersion of measures assessing parental behaviors. Means and standard deviations for the all of the scales used in this study are detailed in Table 1. Regarding responses to the PBI, participants rated their mothers and fathers highly on the Care scale and moderately on the Overprotection scale. Further, the participants in this study rated their mothers ($M = 29.53$, $SD = 6.58$) significantly higher on the Care scale, $t(158) = 5.24$, $p < .001$, than the average respondent ($M = 26.8$) in a normative study. Similarly, participants rated their fathers ($M = 25.50$, $SD = 8.33$) significantly higher on the Care scale, $t(153) = 3.88$, $p < .001$, than the average respondent ($M = 22.9$) in a normative study (Parker et al., 1979). In contrast, adolescents rated their mothers ($M = 14.28$, $SD = 7.58$) and fathers ($M = 12.94$, $SD = 7.48$) similarly to the average respondent on the Overprotection scale

($M = 14.7$ for mothers, $M = 11.9$ for fathers), t (158) = -.70, $p < .49$ for mothers and t (153) = 1.72, $p < .09$ for fathers.

Although average scores on the APQ have not been established previously for this age group, the participants in this study rated their mothers and fathers highly on the combined Positive Parenting/Involvement composite. In addition, scores for mothers were higher on the combined Positive Parenting/Involvement composite ($M = 59.12$, $SD = 11.56$) than for fathers ($M = 52.64$, $SD = 11.91$), t (152) = 7.08, $p < .001$. Participants rated their mothers and fathers moderately on the Inconsistency and Poor Monitoring scales. Comparing scores for mothers and fathers, they rated their mothers higher on the Inconsistency scale ($M = 15.78$, $SD = 3.83$) than their fathers ($M = 14.72$, $SD = 3.90$), t (152) = 3.82, $p < .001$. In contrast, they rated their fathers higher on the Poor Monitoring scale ($M = 26.82$, $SD = 6.93$) than their mothers ($M = 25.14$, $SD = 6.71$), t (152) = -4.40, $p < .001$. Participants in the study rated their mothers and fathers as low in Corporal Punishment according to their responses to the APQ. Moreover, participants' ratings of their parents were relatively similar on the expanded Corporal Punishment scale for both mothers ($M = 12.46$, $SD = 5.41$) and fathers ($M = 12.21$, $SD = 5.56$), t (152) = 0.27, $p < .79$.

Analyses also were conducted to examine the central tendency and dispersion of measures assessing cognitive variables. Participants' scores on the total NMRS scale in this study ($M = 110.64$, $SD = 14.95$) indicated significantly higher self-efficacy and expectation of regulating negative mood, t (159) = 9.50, $p < .001$, than the average undergraduate respondent from the normative study ($M = 99.41$, $SD = 14.33$; Catanzaro & Mearns, 1990). Similarly, participants' scores on the LOT-R ($M = 16.37$, $SD = 3.80$) indicated significantly higher

optimism, t (159) = 6.78, $p < .001$, than that experienced by the average respondent in a previous study (M = 14.33, SD = 4.28; Scheier et al., 1994). Participants' scores on the GSE (M = 32.89, SD = 3.41) indicated significantly higher self-efficacy, t (159) = 13.40, $p < .001$, than that experienced by the average undergraduate student in a previous study (M = 29.28, SD = 5.22; Schwarzer, Mueller, & Greenglass, 1999). In contrast, participants' scores on the RRS-A scale (M = 22.79, SD = 6.33) revealed similar self-reports of ruminative thinking relative to the average respondent in a previous study (M = 21.70, SD = 6.60 for males and M = 23.60, SD = 6.20 for females; t [45] = 16.48, $p < .001$ for males and t [113] = 20.00, $p < .001$ for females; Butler & Nolen-Hoeksema, 1994). Finally, relative to the possible range (15 to 75) for the SAM composite score that was created for this study, participants' average score on the SAM scale (M = 43.07, SD = 9.91) was moderate.

Finally, analyses were conducted to examine the central tendency and dispersion of measures assessing stress/health. Adolescents' scores on the PSS (M = 21.62, SD = 6.25) indicated significantly lower levels of perceived stress, t (159) = -3.16, $p < .002$, than that experienced by the average college student in a previous study (M = 23.18, SD = 7.31; Cohen et al., 1983). On the SF-12 composite created for this study, participants' self-reported significantly better health (M = 82.65, SD = 9.55) than was indicated by the averaged mean from the normative sample (M = 76.82, SD = 24.93), t (159) = 7.73, p < .001 (Ware, Kosinski, Turner-Bowker, & Gandek, 2005).

Table 1. *Means and Standard Deviations for Study Measures*

Variable	M	SD	Range
Adolescents' Ratings of Parental Behaviors			
Maternal Care (PBI-C)	29.53	6.58	5 – 36
Paternal Care (PBI-C)	25.50	8.33	0 – 36
Maternal Overprotection (PBI-OP)	14.28	7.58	0 – 37
Paternal Overprotection (PBI-OP)	12.94	7.48	0 – 37
Maternal Positive Parenting/Involvement (APQ-PP/I)	59.12	11.56	28 – 79
Paternal Positive Parenting/Involvement (APQ-PP/I)	52.64	11.91	18 – 77
Maternal Inconsistency (APQ-Inc)	15.78	3.83	7 – 26
Paternal Inconsistency (APQ-Inc)	14.72	3.90	6 – 25
Expanded Maternal Corporal Punishment (APQ-CP)	12.46	5.41	7 – 32
Expanded Paternal Corporal Punishment (APQ-CP)	12.21	5.56	7 – 35
Maternal Poor Monitoring (APQ-PM)	25.14	6.71	10 – 43
Paternal Poor Monitoring (APQ-PM)	26.82	6.93	10 – 48
Adolescents' Cognitions			
Total Negative Mood Regulation Scale (NMRS)	110.64	14.95	56 – 146
Life Orientation Test - Revised (LOT-R)	16.37	3.80	6 – 24
General Self-Efficacy Scale (GSE)	32.89	3.41	20 – 40
Ruminative Response Scale – Abbreviated (RRS-A)	22.79	6.33	10 – 40
Adjusted Stress Appraisal Measure (SAM)	43.07	9.91	23 – 75
Adolescents' Stress/Health			
Perceived Stress Scale (PSS)	21.62	6.25	3 – 44
12-Item Short-Form Health Survey (SF-12)	82.65	9.55	42 – 97

Note. PBI = Parental Bonding Instrument and APQ = Alabama Parenting Questionnaire.

Correlations Among Indicator Variables

Correlational analyses were used to examine the relationships among the variables in this study. In particular, correlations provided information relevant to the hypotheses that more positive parenting would be related to more adaptive cognitions and better stress/health in adolescents and that more adaptive cognitions and health behaviors would be related to better stress/health. Correlations among the variables in this study are reported in Table 2.

Consistent with the hypotheses, several parental behaviors were correlated significantly with adolescents' cognitions. In particular, greater parental Overprotection (PBI) was related significantly to lower expectancy of mood regulation (NMRS; $r = -.21$, $p < .01$ for mothers and $r = -.29$, $p < .001$ for fathers), lower optimism (LOT-R; $r = -.19$, $p < .02$ for mothers and $r = -.20$, $p < .01$ for fathers), and greater ruminative thinking (RRS; $r = .27$, $p < .001$ for mothers and $r = .36$, $p < .001$ for fathers). Parents' Overprotection (PBI), however, was not related significantly to situation-specific appraisals of threat (adjusted SAM; $r = .09$, $p < .24$ for mothers and $r = .14$, $p < .08$ for fathers). In contrast, more Positive Parenting/Involvement (APQ) was related significantly to greater expectancy of mood regulation (NMRS; $r = .36$, $p < .001$ for mothers and $r = .26$, $p < .001$ for fathers), more optimism (LOT-R; $r = .34$, $p < .001$ for mothers and $r = .27$, $p < .001$ for fathers), and less situation-specific appraisal of threat (adjusted SAM; $r = -.20$, $p < .01$ for mothers and $r = -.26$, $p < .001$ for fathers). Further, more Positive Parenting/Involvement (APQ) from mothers was related significantly to less ruminative thinking (RRS; $r = -.18$, $p <$

.02); however, this relationship was not significant when examining fathers' Positive

Parenting/Involvement ($r = -.06$, $p < .49$).

Maternal use of Corporal Punishment (APQ) also was related significantly to lower

expectancy of mood regulation (NMRS; $r = -.19$, $p < .02$) and more ruminative thinking (RRS; r

$= .17$, $p < .03$) but was not related significantly to optimism (LOT-R; $r = -.09$, $p < .28$) or

situation-specific appraisal of threat (adjusted SAM; $r = -.10$, $p < .23$). Paternal use of Corporal

Punishment (APQ) was only correlated significantly with less optimism (LOT-R; $r = -.17$, $p <$

.03). In addition, greater maternal Inconsistency (APQ) correlated significantly with more

ruminative thinking (RRS; $r = .20$, $p < .01$); however, this relationship was not significant when

examining paternal Inconsistency ($r = .04$, $p < .63$). Parents' Inconsistency (APQ) did not

correlate significantly with expectancy of mood regulation (NMRS; $r = -.10$, $p < .21$ for mothers

and $r = .03$, $p < .70$ for fathers), optimism (LOT-R; $r = .04$, $p < .61$ for mothers and $r = .04$, $p <$

.63 for fathers), or situation-specific appraisal of threat (adjusted SAM; $r = .08$, $p < .34$ for

mothers and $r = .07$, $p < .37$ for fathers). Likewise, parents' Poor Monitoring (APQ) did not

correlate significantly with mood regulation (NMRS; $r = -.11$, $p < .16$ for mothers and $r = -.13$, p

$< .11$ for fathers), optimism (LOT-R; $r = -.12$, $p < .14$ for mothers and $r = -.09$, $p < .27$ for

fathers), ruminative thinking (RRS; $r = .05$, $p < .57$ for mothers and $r = .01$, $p < .92$ for fathers),

or situation-specific appraisal of threat (adjusted SAM; $r = .08$, $p < .29$ for mothers and $r = .13$, p

$< .12$ for fathers).

Also consistent with the hypotheses, several parental behaviors were related significantly

with adolescents' overall health and perceived stress. Specifically, less Overprotection (PBI; $r =$

-.32, $p < .001$ for mothers and $r = -.27$, $p < .001$ for fathers), more Positive Parenting/

Involvement (APQ; $r = .24$, $p < .002$ for mothers and $r = .22$, $p < .005$ for fathers), less

Inconsistency (APQ; $r = -.17$, $p < .03$ for mothers and $r = -.16$, $p < .05$ for fathers), and less Poor

Monitoring (APQ; $r = -.15$, $p < .05$ for mothers and $r = -.23$, $p < .004$ for fathers) were correlated

significantly with better overall health (SF-12). Less maternal Corporal Punishment (APQ) also

was correlated to overall health (SF-12; $r = -.20$, $p < .01$); however, this relationship was not

significant when examining paternal Corporal Punishment ($r = -.02$, $p < .80$). Lower

Overprotection (APQ) from both mothers ($r = .42$, $p < .001$) and fathers ($r = .29$, $p < .001$) was

related significantly to lower overall perceived stress (PSS). Maternal Positive

Parenting/Involvement (APQ; $r = -.24$, $p < .003$) and maternal Corporal Punishment (APQ; $r = .17$, $p < .03$) also were related to overall perceived stress (PSS). In contrast, paternal Positive

Parenting/Involvement (APQ; $r = -.14$, $p < .09$) and paternal Corporal Punishment (APQ; $r = -.03$, $p < .71$) were not related significantly to overall perceived stress. Finally, neither parents'

Inconsistency (APQ; $r = .12$, $p < .14$ for mothers and $r = .13$, $p < .12$ for fathers) nor Poor

Monitoring (APQ; $r = .12$, $p < .13$ for mothers and $r = .12$, $p < .13$ for fathers) was related

significantly to overall perceived stress (PSS).

The study hypotheses also were supported in that all cognitive measures were related to

adolescents' overall health and perceived stress. In particular, greater expectancy of mood

regulation (NMRS; $r = -.54$, $p < .001$), more optimism (LOT-R; $r = -.50$, $p < .001$), less

ruminative thinking (RRS; $r = .54$, $p < .001$), and less situation-specific appraisal of threat

(adjusted SAM; $r = .31$, $p < .001$) were related to lower levels of participants' overall perceived

stress (PSS). Likewise, greater expectancy of mood regulation (NMRS; $r = .50$, $p < .001$), more optimism (LOT-R; $r = .37$, $p < .001$), less ruminative thinking (RRS; $r = -.45$, $p < .001$), and less situation-specific appraisal of threat (adjusted SAM; $r = -.19$, $p < .02$) were related significantly to participants' self-report of greater overall health (SF-12).

Contrary to the hypotheses, blood pressure reactivity for both SBP and DBP either were not related to other study variables or were related to other study variables in a direction opposite to that which was predicted. More specifically, regarding parental behaviors, greater paternal Overprotection (PBI) was related to *lower* diastolic blood pressure reactivity ($r = -.18$, $p < .03$). Regarding adolescent cognitions, participants' mood regulation expectancies (NMRS; $r = .05$, $p < .50$), optimism (LOT-R; $r = .03$, $p < .71$), ruminative thinking (RRS; $r = -.11$, $p < .19$), or perceived situational threat (adjusted SAM; $r = -.11$, $p < .17$) were not related significantly to their systolic blood pressure reactivity. Likewise, participants' mood regulation expectancies (NMRS; $r = .03$, $p < .76$), optimism (LOT-R; $r = -.06$, $p < .49$), ruminative thinking (RRS; $r = -.14$, $p < .07$), and perceived situational threat (adjusted SAM; $r = -.10$, $p < .22$) also were not related to their diastolic blood pressure reactivity. Regarding stress/health, *higher* overall perceived stress (PSS) was related significantly to *lower* SBP reactivity ($r = -.18$, $p < .03$) and *lower* DBP reactivity ($r = -.16$, $p < .05$). In addition, overall health (SF-12) was not related significantly to blood pressure reactivity ($r = .11$, $p < .16$ for SBP and $r = .10$, $p < .21$ for DBP). Regarding health behaviors, *lower* drug use (AHBQ) was related to greater systolic blood pressure reactivity ($r = -.19$, $p < .02$).

Also contrary to the hypotheses, several health behaviors scores did not relate significantly to health/stress as predicted. In particular, overall health (SF-12) was not correlated significantly with sleep ($r = .16$, $p < .06$), drug use ($r = -.12$, $p < .16$), or poor diet ($r = -.05$, $p < .56$). Likewise, adolescents' overall perceived stress (PSS) was not related to drug use ($r = .11$, $p < .17$) or poor diet ($r = .05$, $p < .55$). In contrast, both overall health (SF-12; $r = .21$, $p < .01$) and overall perceived stress (PSS; $r = -.21$, $p < .01$) were related to participants' self-reported amount of exercise. In addition, participants' overall perceived stress (PSS) was related significantly to their average nightly hours of sleep ($r = -.20$, $p < .01$).

Table 2. *Correlations Among Indicator Variables*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.
1. M.PBI-OP	1																					
2. M.APQ-PP/I	-.21*	1																				
3. M.APQ-CP	.29**	-.19*	1																			
4. M.APQ-Inc	.13	-.23**	.01	1																		
5. M.APQ-PM	-.18*	-.38**	-.02	.43**	1																	
6. F.PBI-OP	.39**	-.26**	.11	-.03	-.12	1																
7. F.APQ-PP/I	-.08	.51**	-.10	-.11	-.16*	-.19**	1															
8. F.APQ-CP	.01	-.13	.51**	.02	.08	.19**	-.15	1														
9. F.APQ-Inc	.11	-.06	-.07	.53**	.34**	-.01	.06	-.10	1													
10. F.APQ-PM	-.14	-.20**	.00	.33**	.80**	-.23**	-.30**	.10	.36**	1												
11. NMRS	-.21**	.36**	-.19*	-.10	-.11	-.29**	.26**	-.08	.03	-.13	1											
12. LOT-R	-.19*	.34**	-.09	.04	-.12	-.20**	.27**	-.17*	.04	-.09	56**	1										
13. RRS-A	.27**	-.18*	.17*	.20**	.05	.36**	-.06	.01	.04	.01	-.65**	-.40**	1									
14. Adj-SAM	.09	-.20**	-.10	.08	.08	.14	-.26**	-.08	.07	.13	-.29**	-.37**	.26**	1								
15. PSS	.42**	-.24**	.17*	.12	.12	.29**	-.14	-.03	.13	.12	-.54**	-.50**	.54**	.31**	1							
16. SF-12	-.32**	.24**	-.20**	-.17*	-.15*	-.27**	.22**	-.02	-.16*	-.23**	.50**	.37**	-.45**	-.19*	-.67**	1						
17. SBP-R	-.06	.02	.06	.00	.01	-.14	.02	.01	-.06	.00	.05	.03	-.11	-.11	-.18*	.11	1					
18. DBP-R	-.06	-.01	.10	-.10	-.03	-.18*	-.02	.08	-.08	.01	.03	-.06	-.14	-.10	-.16*	.10	.74**	1				
19. Sleep	-.17*	.10	-.21**	.00	.06	.02	-.16*	.08	-.01	.14	.04	.08	-.10	.09	-.20**	.16	-.11	-.04	1			
20. Exercise	-.17*	.05	-.21**	.10	.15	-.15	-.02	.05	-.01	.08	.24**	.03	-.20**	-.09	-.21**	.21**	-.09	-.07	.17*	1		
21. Drug Use	-.06	-.09	-.15	.21**	.32**	.10	-.04	-.10	.12	.15	-.03	-.05	.10	.03	.11	-.12	-.19*	-.15	.09	.14	1	
22. Poor Diet	.03	-.14	-.04	.03	.06	-.05	-.11	.01	-.07	-.02	-.02	-.09	.13	-.09	.05	-.05	-.03	-.08	-.09	.03	.15	1

Note. Scales regarding mothers are denoted with the prefix "M." and scales regarding fathers are denoted with the prefix "F." PBI-OP = Overprotection, APQ-PP/I = Positive Parenting/Involvement, APQ-CP = Corporal Punishment, APQ-Inc = Inconsistency, APQ-PM = Poor Monitoring, NMRS = Negative Mood Regulation Scale, LOT-R = Life Orientation Test-Revised, RRS-A = Ruminative Response Scale-Abbreviated, Adj-SAM = adjusted Stress Appraisal Measure, PSS = Perceived Stress Scale, SF-12 = 12-Item Short-Form Health Survey, SBP-R = systolic blood pressure reactivity, and DBP-R = diastolic blood pressure reactivity. *$p < .05$, **$p < .01$, **$p < .001$

To examine the hypothesis that positive parental behaviors will account for the most variance in adolescents' stress/health and to determine whether other parental behaviors account for unique variance in adolescents' stress/health, hierarchical regression analyses were conducted. In particular, regressions were conducted as part of an examination of the amount of significant and unique variance in adolescents' stress/health outcomes accounted for by parents' positive parenting/involvement, punishment, inconsistency, overprotection, and poor monitoring. Two sets of hierarchical regressions were conducted, one set with the PSS score (i.e., perceived stress) as the criterion variable and one set with the SF-12 score (i.e., overall health) as the criterion variable. Separate regressions were conducted regarding participants' perceptions of their mothers (see Tables 3 and 4) and their fathers (see Tables 5 and 6).

The predictor variable in block one of each regression was the combined Positive Parenting/Involvement scale from the APQ. The parental Corporal Punishment scale from the APQ was entered in block two, and the parental Inconsistency scale was entered in block three. In block four, the parental Overprotection scale from the PBI was entered. Finally, the parental Poor Monitoring scale from the APQ was entered in block five. Parental Behaviors were entered in this order because it was hypothesized that Positive Parenting/Involvement would account for significant variance in stress/health and would remain the most salient predictor even when other parental behaviors were added to the regression. Corporal Punishment was entered in the second step because it was reasoned that parental use of physical punishment may account for additional

variance in stress/health as it could have been a source of stress in the participants' lives and established a foundation for readily perceiving threat in the environment. Inconsistency was chosen as the third predictor to determine whether inconsistent use of discipline accounted for any addition variance in stress/health beyond the role of corporal punishment. Parental Overprotection and Poor Monitoring were entered as the fourth and fifth variables because it was reasoned that these would account for the least variance in stress/health and would add marginal to non-significant predictive value in the presence of the previously entered variables.

Regressions Regarding Mothers

For participants' perceived stress (i.e., PSS score), the composite score for maternal Positive Parenting/Involvement was a significant predictor in block one, $F (1, 157) = 9.44$, $p < .003$, $R^2 = .06$. In block two, the overall regression equation remained significant with the addition of maternal Corporal Punishment, $F (2, 156) = 6.09$, $p < .003$, $R^2 = .07$, $\Delta R^2 = .02$; however, maternal Corporal Punishment did not account for a significant amount of the residual variance ($p < .11$). In this block, Positive Parenting/Involvement remained a significant predictor ($p < .007$). With the addition of maternal Inconsistency in block three, the overall regression equation remained significant, $F (3, 155) = 4.33$, $p < .006$, $R^2 = .08$, $\Delta R^2 = .01$, and Positive Parenting/Involvement remained a significant predictor ($p < .02$). In this block, maternal Inconsistency did not account for a significant amount of the remaining variance ($p < .37$). In block four, the overall regression equation remained significant, $F (4, 154) = 9.57$, $p < .001$, $R^2 = .20$, $\Delta R^2 = .12$, and maternal Overprotection accounted for a significant amount of the residual

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variance ($p < .001$). In this block, Positive Parenting/Involvement was a marginally significant predictor ($p < .06$). Finally, in the last block, the overall regression equation remained significant, $F (5, 153) = 8.68$, $p < .001$, $R^2 = .22$, $\Delta R^2 = .02$, and maternal Poor Monitoring accounted for a significant amount of the residual variance *($p < .04$)*. In this block, maternal Overprotection also remained a significant predictor ($p < .001$). In summary, maternal Positive Parenting/Involvement, Overprotection, and Poor Monitoring were significant predictors of adolescents' stress, with Overprotection ($p < .001$) and Poor Monitoring ($p < .04$) remaining significant in the final step when all variables were considered together.

For participants' overall health (i.e., SF-12 score), the combined scale of maternal Positive Parenting/Involvement was a significant predictor in block one, $F (1, 157) = 9.81$, $p < .002$, $R^2 = .06$. In block two, the overall regression equation remained significant with the addition of maternal Corporal Punishment, $F (2, 156) = 7.15$, $p < .001$, $R^2 = .08$, $\Delta R^2 = .03$, with maternal Corporal Punishment accounting for a significant amount of the residual variance ($p < .04$). In this block, Positive Parenting/Involvement also remained a significant predictor ($p < .008$). With the addition of maternal Inconsistency in block three, the overall regression equation remained significant, $F (3, 155) = 5.69$, $p < .001$, $R^2 = .10$, $\Delta R^2 = .02$, and Positive Parenting/Involvement ($p < .03$) and Corporal Punishment ($p < .03$) remained significant predictors. In this block, maternal Inconsistency did not account for a significant amount of the remaining variance ($p < .11$). In block four, the overall regression equation remained significant, $F (4, 154) = 6.90$, $p < .001$, $R^2 = .15$, $\Delta R^2 = .05$, with maternal Overprotection accounting for a significant amount of the residual variance ($p < .002$). In this block, Positive

Parenting/Involvement also was a marginally significant predictor ($p < .06$). Finally, in the last

block, the overall regression equation remained significant, $F (5, 153) = 6.18$, $p < .001$, $R^2 = .17$,

$\Delta R^2 = .02$, with maternal Poor Monitoring accounting for a marginally significant amount of the

residual variance ($p < .09$). In this block, maternal Overprotection also remained a significant

predictor ($p < .001$). In summary, maternal Positive Parenting/Involvement, Corporal

Punishment, and Overprotection were significant predictors of participants' overall health, with

only Overprotection remaining significant ($p < .01$) and Poor Monitoring being marginally

significant in the final step ($p < .09$).

Table 3. *Hierarchical Regression: Mothers' Behaviors Predicting Adolescents' Stress (PSS)*

	df	F	p	R^2	ΔR^2	B	SE B	β
Block 1	1, 157	9.44	.003	.06	.06			
APQ - PP/I			.003			.13	.04	.24
Block 2	2, 156	6.09	.003	.07	.02			
APQ - PP/I			.007			.12	.04	.21
APQ - CP			.11			-.15	.09	-.13
Block 3	3, 155	4.33	.006	.08	.01			
APQ - PP/I			.02			.11	.04	.20
APQ - CP			.10			-.15	.09	-.13
APQ - Inc			.37			-.12	.13	-.07
Block 4	4, 154	9.57	.001	.20	.12			
APQ - PP/I			.06			.08	.04	.15
APQ - CP			.67			-.04	.09	-.03
APQ - Inc			.63			-.06	.12	-.04
PBI - OP			.001			-.31	.06	-.37
Block 5	5, 153	8.68	.001	.22	.02			
APQ - PP/I			.33			.04	.04	.08
APQ - CP			.65			-.04	.09	-.03
APQ - Inc			.66			.06	.13	.04
PBI - OP			.001			-.35	.07	-.43
APQ - PM			.04			-.17	.08	-.19

Note. APQ-PP/I = Positive Parenting/Involvement, APQ-CP = Corporal Punishment, APQ-Inc = Inconsistency, PBI-OP = Overprotection, and APQ-PM = Poor Monitoring.

Table 4. *Hierarchical Regression: Mothers' Behaviors Predicting Adolescents' Health (SF-12)*

	df	F	p	R^2	ΔR^2	B	SE B	β
Block 1	1, 157	9.81	.002	.06	.06			
APQ - PP/I			.002			-.20	.06	-.24
Block 2	2, 156	7.15	.001	.08	.03			
APQ - PP/I			.008			-.17	.06	-.21
APQ - CP			.04			.29	.14	.16
Block 3	3, 155	5.69	.001	.10	.02			
APQ - PP/I			.03			-.15	.07	-.18
APQ - CP			.03			.29	.14	.17
APQ - Inc			.11			.32	.20	.13
Block 4	4, 154	6.90	.001	.15	.05			
APQ - PP/I			.06			-.12	.06	-.15
APQ - CP			.20			.18	.14	.10
APQ - Inc			.18			.26	.19	.10
PBI - OP			.002			.31	.10	.24
Block 5	5, 153	6.18	.001	.17	.02			
APQ - PP/I			.28			-.08	.07	-.09
APQ - CP			.19			.18	.14	.10
APQ - Inc			.62			.10	.21	.04
PBI - OP			.001			.37	.11	.29
APQ - PM			.09			.23	.13	.16

Note. APQ-PP/I = Positive Parenting/Involvement, APQ-CP = Corporal Punishment, APQ-Inc = Inconsistency, PBI-OP = Overprotection, and APQ-PM = Poor Monitoring.

Regressions Regarding Fathers

For participants' perceived stress (i.e., PSS score), the composite score of paternal Positive Parenting/Involvement was a marginally significant predictor in block one, $F(1, 152) = 3.13$, $p < .08$, $R^2 = .02$. In block two, the overall regression equation was not significant with the addition of paternal Corporal Punishment, $F(2, 151) = 1.77$, $p < .17$, $R^2 = .02$, $\Delta R^2 = .003$. In this block, paternal Corporal Punishment did not account for a significant amount of the residual variance ($p < .52$), but Positive Parenting/Involvement remained a marginally significant predictor ($p < .07$). With the addition of paternal Inconsistency in block three, the overall regression equation was not significant, $F(3, 150) = 2.08$, $p < .11$, $R^2 = .04$, $\Delta R^2 = .02$, but Positive Parenting/Involvement remained a marginally significant predictor ($p < .06$). In block four, the overall regression equation became significant, $F(4, 149) = 5.06$, $p < .001$, $R^2 = .12$, $\Delta R^2 = .08$, with paternal Overprotection accounting for a significant amount of the residual variance ($p < .001$). Finally, in the last block, the overall regression equation remained significant, $F(5, 148) = 4.84$, $p < .001$, $R^2 = .14$, $\Delta R^2 = .02$, with paternal Poor Monitoring accounting for a marginally significant amount of the residual variance ($p < .06$). In this block, paternal Overprotection remained a significant predictor ($p < .001$). In summary, paternal Overprotection was a significant predictor of participants' overall perceived stress, with Overprotection remaining significant ($p < .001$) and Poor Monitoring remaining marginally significant ($p < .06$) in the final step when all variables were considered together.

For participants' overall health (i.e., SF-12 score), the composite score for paternal Positive Parenting/Involvement was a significant predictor in block one, $F(1, 152) = 8.40$, $p < .004$, $R^2 = .05$. In block two, the overall regression equation remained significant with the addition of paternal Corporal Punishment, $F(2, 151) = 4.19$, $p < .02$, $R^2 = .05$, $\Delta R^2 < .001$; however, paternal Corporal Punishment did not account for a significant amount of the residual variance ($p < .86$). In this block, Positive Parenting/Involvement remained a significant predictor ($p < .005$), however. With the addition of paternal Inconsistency in block three, the overall regression equation remained significant, $F(3, 150) = 4.43$, $p < .005$, $R^2 = .08$, $\Delta R^2 = .03$, with Positive Parenting/Involvement remaining a significant predictor ($p < .003$). In this block, paternal Inconsistency also accounted for a significant amount of the remaining variance ($p < .03$). In block four, the overall regression equation remained significant, $F(4, 149) = 5.78$, $p < .001$, $R^2 = .13$, $\Delta R^2 = .05$, with paternal Overprotection accounting for a significant amount of the residual variance ($p < .003$). In this block, Positive Parenting/Involvement ($p < .01$) and Inconsistency ($p < .03$) also remained significant predictors. Finally, in the last block, the overall regression equation remained significant, $F(5, 148) = 6.34$, $p < .001$, $R^2 = .18$, $\Delta R^2 = .04$, with paternal Poor Monitoring accounting for a significant amount of the residual variance ($p < .007$). In this block, paternal Overprotection also remained a significant predictor ($p < .001$). In summary, paternal Positive Parenting/Involvement, Inconsistency, Overprotection, and Poor Monitoring were significant predictors of adolescents' overall health, with only Overprotection ($p < .001$) and Poor Monitoring ($p < .007$) remaining significant in the final step when all variables were considered together.

Table 5. *Hierarchical Regression: Fathers' Behaviors Predicting Adolescents' Stress (PSS)*

	df	F	p	R^2	ΔR^2	B	SE B	β
Block 1	1, 152	3.13	.08	.02	.02			
APQ - PP/I			.08			.07	.04	.14
Block 2	2, 151	1.77	.17	.02	.003			
APQ - PP/I			.07			.08	.04	.15
APQ - CP			.52			.06	.09	.05
Block 3	3, 150	2.08	.11	.04	.02			
APQ - PP/I			.06			.08	.04	.16
APQ - CP			.62			.05	.09	.04
APQ - Inc			.11			-.21	.13	-.13
Block 4	4, 149	5.06	.001	.12	.08			
APQ - PP/I			.16			.06	.04	.11
APQ - CP			.25			.10	.09	.09
APQ - Inc			.11			-.20	.12	-.13
PBI - OP			.001			-.24	.07	-.29
Block 5	5, 148	4.84	.001	.14	.02			
APQ - PP/I			.59			.02	.04	.05
APQ - CP			.15			.13	.09	.12
APQ - Inc			.51			-.09	.14	-.06
PBI - OP			.001			-.29	.07	-.35
APQ - PM			.06			-.16	.08	-.18

Note. APQ-PP/I = Positive Parenting/Involvement, APQ-CP = Corporal Punishment, APQ-Inc = Inconsistency, PBI-OP = Overprotection, and APQ-PM = Poor Monitoring.

Table 6. *Hierarchical Regression: Fathers' Behaviors Predicting Adolescents' Health (SF-12)*

	df	F	p	R^2	ΔR^2	B	SE B	β
Block 1	1, 152	8.40	.004	.05	.05			
APQ - PP/I			.004			-.18	.06	-.23
Block 2	2, 151	4.19	.02	.05	.001			
APQ - PP/I			.005			-.18	.06	-.23
APQ - CP			.86			-.02	.14	-.01
Block 3	3, 150	4.43	.01	.08	.03			
APQ - PP/I			.003			-.19	.06	-.24
APQ - CP			.99			.00	.14	.00
APQ - Inc			.03			.42	.19	.17
Block 4	4, 149	5.78	.001	.13	.05			
APQ - PP/I			.01			-.16	.06	-.20
APQ - CP			.61			-.07	.13	-.04
APQ - Inc			.03			.41	.19	.17
PBI - OP			.003			.30	.10	.24
Block 5	5, 148	6.34	.001	.18	.04			
APQ - PP/I			.19			-.09	.07	-.11
APQ - CP			.34			-.13	.13	-.07
APQ - Inc			.42			.16	.20	.07
PBI - OP			.001			.40	.10	.32
APQ - PM			.007			.35	.13	.25

Note. APQ-PP/I = Positive Parenting/Involvement, APQ-CP = Corporal Punishment, APQ-Inc = Inconsistency, PBI-OP = Overprotection, and APQ-PM = Poor Monitoring.

Structural Equation Modeling

Latent Constructs and Their Indicators

To examine the hypotheses that parental behaviors would predict cognitions and stress/health in adolescents and that the relationship between parental behaviors and stress/health would be mediated by adolescents' cognitions, structural equation modeling was used. The hypothesized path model consists of three latent constructs including Parental Behaviors, Adolescents' Cognitions, and Adolescents' Stress/Health. The hypothesized model also contains four exogenous manifest variables related to Adolescents' Stress/Health, which include sleep, drug use, poor diet, and exercise. The Overprotection subscale of the PBI and four subscales from the APQ (i.e., Positive Parenting/Involvement, Corporal Punishment, Inconsistency, and Poor Monitoring) are indicators for *Parental Behaviors*. These variables indicate parental control and autonomy granting, use of physical punishment, follow through and consistency, and praise and involvement. The total scores from the NMRS, LOT-R, GSE, and RRS-A, as well as the adjusted SAM scale score, are indicators for *Adolescents' Cognitions*. These variables indicate positive emotional expectancies, optimism, self-efficacy, ruminative thinking, perceived situational threat, and perceived inability to cope with situational stress. The scores from the PSS, the SF-12, and blood pressure reactivity (both SBP and DBP) are indicators for *Adolescents' Stress/Health*, which is the dependent variable in the path model. These variables represent overall perceived stress, general physical and mental health, and physiological stress

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reactions. Therefore, Parental Behaviors is indicated by five variables, Adolescents' Cognitions is indicated by five variables, and Adolescents' Stress/Health is indicated by four variables in the model. Thus, the model contains 14 indicators and 4 exogenous manifest variables initially. Figure 1 specifies this model using rectangles to represent manifest variables and ovals to represent latent variables. To examine the model in the context of adolescent-mother and adolescent-father relationships, the model is examined separately for data about mothers and data about fathers.
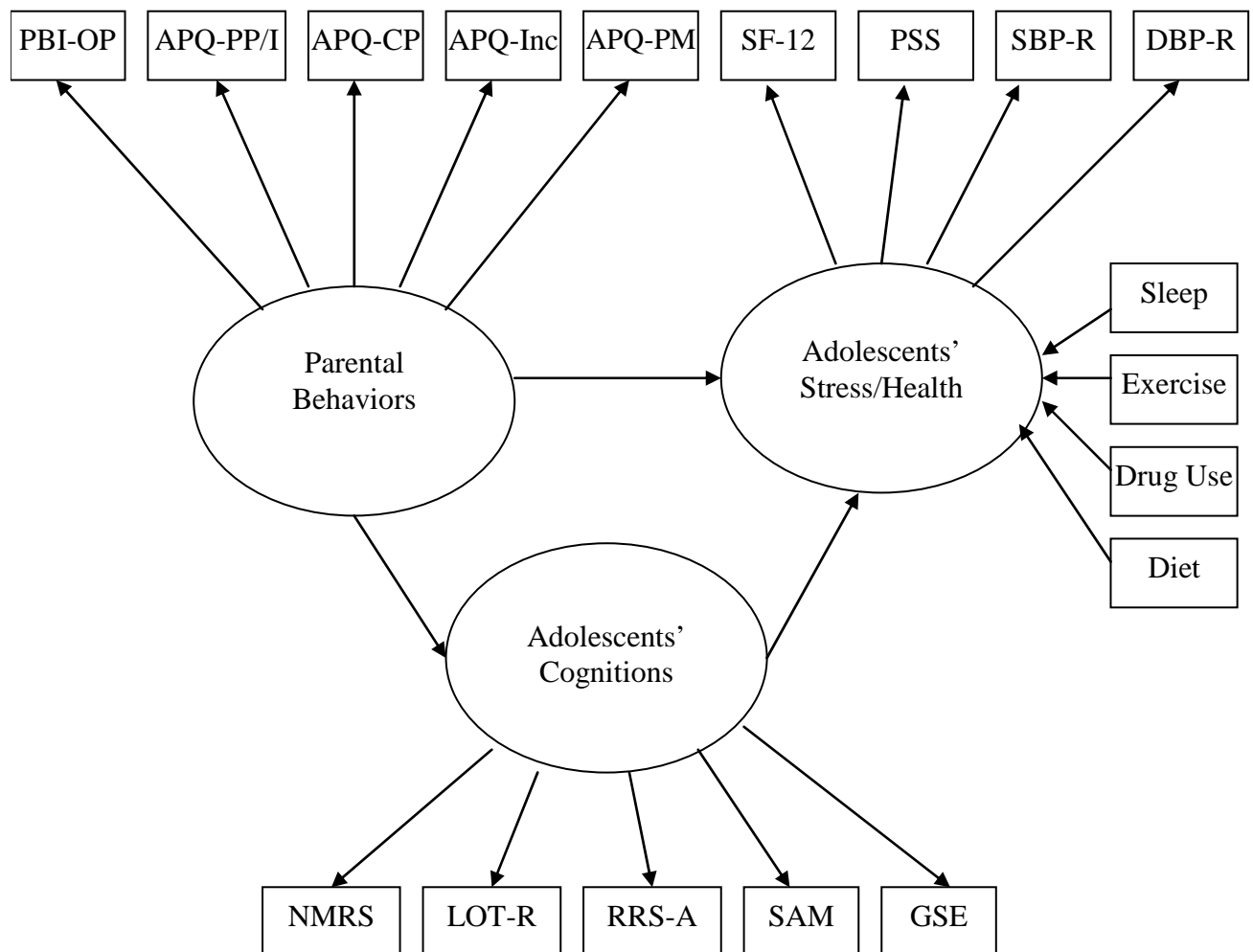
Note. PBI-OP = Overprotection, APQ-PP/I = Positive Parenting/Involvement, APQ-CP = Corporal Punishment, APQ-Inc = Inconsistency, APQ-PM = Poor Monitoring, SF-12 = 12-Item Short-Form Health Survey, PSS = Perceived Stress Scale, SBP-R = Systolic Blood Pressure Reactivity, DBP-R = Diastolic Blood Pressure Reactivity, NMRS = Negative Mood Regulation Scale, LOT-R = Life Orientation Test-Revised, RRS-A = Ruminative Response Scale-Abbreviated, SAM = adjusted Stress Appraisal Measure, and GSE = General Self-Efficacy Scale.

Figure 1. *Theoretical Model of Parent-Adolescent Relationships*

Model Analyses

Structural equation modeling (SEM) analyses were conducted with Statistica SEPATH. The generalized least squares to maximum likelihood (GLS-ML) method of estimating population parameters was used. Goodness of fit of the overall model was examined using three indicators of model fit. The comparative fit index (CFI) was examined to determine acceptable model fit at values of .90 or greater (Bentler, 1992). A value of .10 or less was used to indicate acceptability according to the root mean squared error of approximation (RMSEA; Kline, 1998). Finally, the parsimonious fit index (PFI) was used to indicate sufficient parsimony at values of .60 or greater (James, Mulaik, & Brett, 1982). Chi-square tests were used to compare nested mediational models to non-mediated models.

As recommended by Anderson and Gerbing (1988), a two-stage modeling approach was used to avoid misinterpretations of relationships between latent constructs resulting from inappropriate measurement of the latent variables. In stage 1, latent constructs were permitted to correlate freely, creating a measurement model that was examined for adequate assessment of latent variables. In stage 2, relationships among latent variables were tested using structural analysis. The initial exploratory procedures were used to ensure an adequate measurement model of latent constructs, and the subsequent confirmatory procedures were used to explore the paths of relationship among latent constructs and manifest variables.

Measurement and Structural Models

Correlation matrices served as the input data for all model analyses. The initial measurement models failed to fit the data adequately (RMSEA > .10, CFI < .90) or resulted in failure to run due to singularity. Therefore, the measurement models were respecified by removing variables either that did not clearly relate to their respective latent construct or that overlapped with other manifest variables.

Specifically, during respecification, changes to both the mother and father models were made. First, the Poor Monitoring scale from the APQ was removed due to its theoretical overlap with parental Overprotection from the PBI, as both measures assess aspects of freedom and parental control. The Overprotection subscale was retained in path analyses instead of the Poor Monitoring subscale because it correlated more frequently with other variables examined in this study. Likewise, the total score from the GSE was removed as an indicator from the Adolescents' Cognitions latent variable due to its overlap with the total score from the NMRS, as they are both measures of self-efficacy (i.e., general self-efficacy and emotional self-efficacy, respectively). The NMRS score was retained because it has a wider range of questions and correlated more frequently with other study variables than the GSE score. As mentioned previously, blood pressure reactivity related to several stress/health indicators, but in a direction that was opposite to what was predicted. This unexpected finding made interpretation of the Adolescents' Stress/Health construct unclear (i.e., PSS scores and SF-12 scores suggested that the construct represented positive states in stress/health, whereas blood pressure reactivity suggested that the construct represented worse states in stress/health as reactivity is meant as a

measure of poorer health and greater stress). Therefore, blood pressure was removed during

respecification to assist in interpretation of the Adolescents' Stress/Health latent construct.

Finally, all four health behaviors (i.e., sleep, drug use, poor diet, and exercise) were removed

from the model because they did not relate significantly to Adolescents' Stress/Health (all p's <

.83).

Following respecification, the measurement model examining the mother-adolescent

relationship, which is shown in Figure 2, fit the data adequately (RMSEA = .08, CFI = .93, and

PFI = .61). Furthermore, all indicator variables related significantly to their respective latent

constructs in the mother-adolescent model (all p < .02). Figure 4 depicts the structural model and

path coefficients regarding the mother-adolescent model. It should be noted that, after initial

analyses, the indictor variables for Parental Behaviors were constrained so that Positive

Parenting/Involvement loaded positively onto the construct, and Corporal Punishment,

Inconsistency, and Poor Monitoring loaded negatively onto the construct. In this way, the

Parental Behaviors construct represents more positive, adaptive parental behaviors. Therefore,

the findings could be discussed clearly in relation to the other constructs and the hypotheses. All

fit indices are detailed in Table 7 along with Chi-square values and degrees of freedom for this
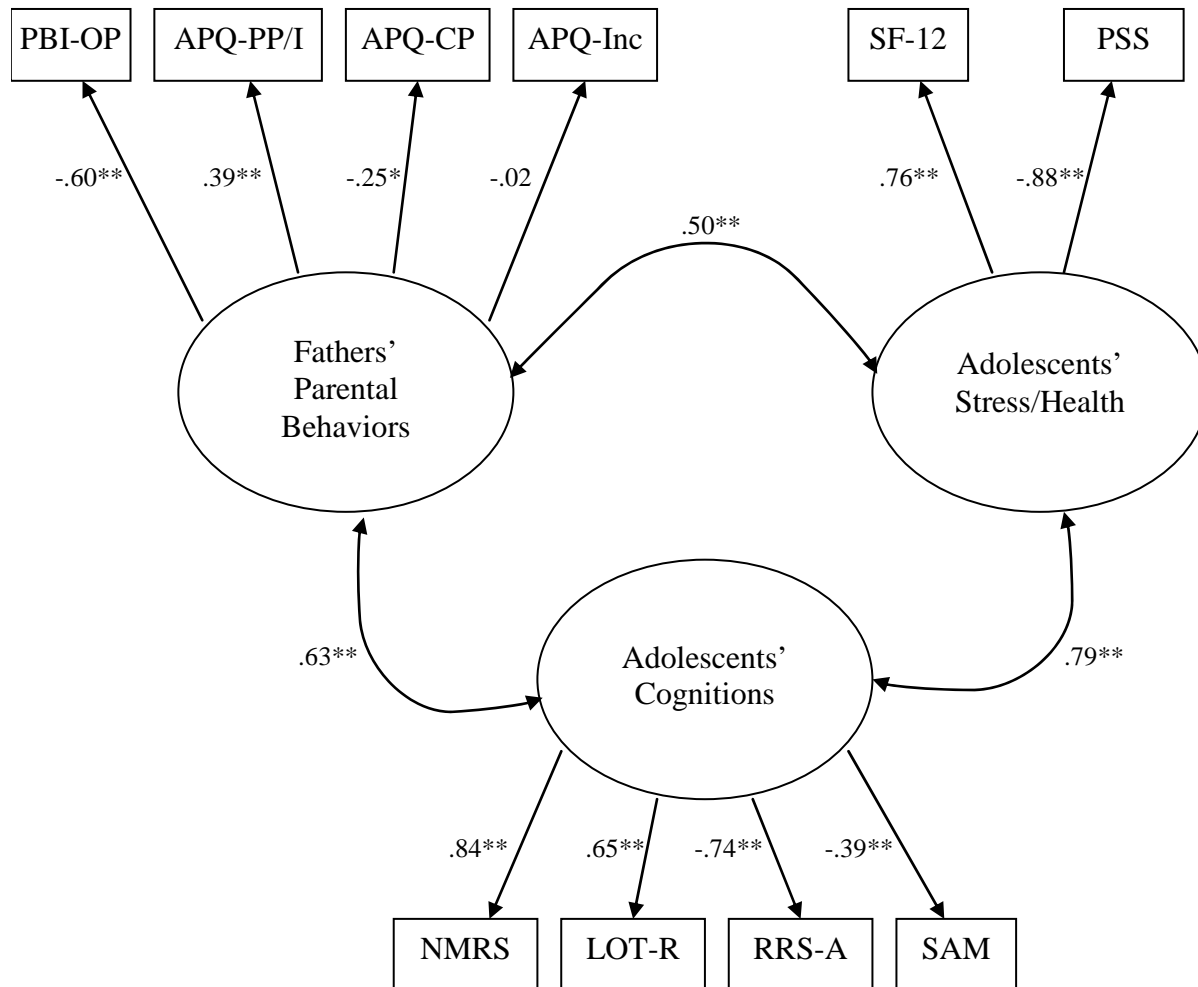
structural model.
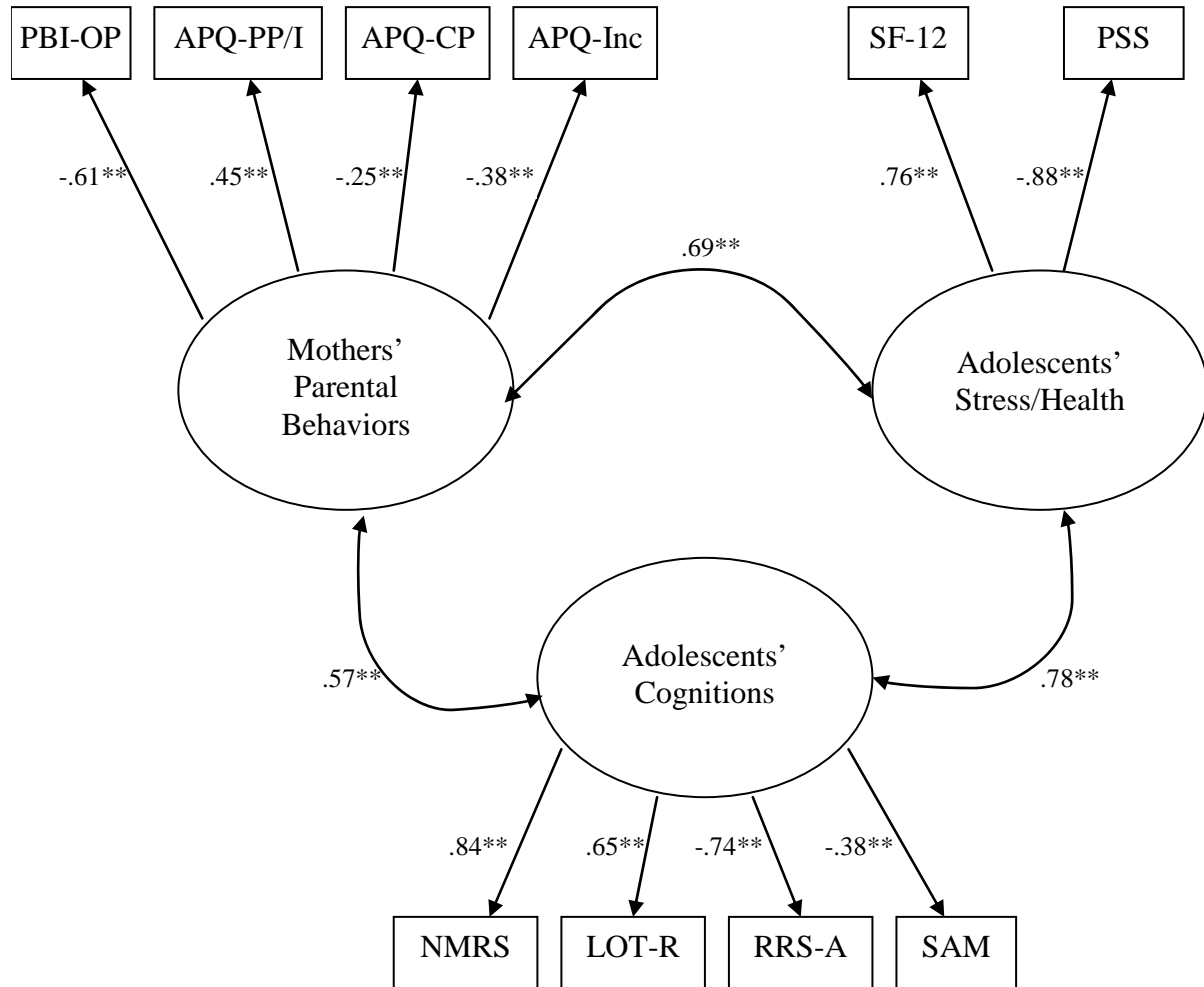
Note. *p* < .05, **p* < .01. Disturbances and measurement error effects are omitted for clarity. PBI-OP = Overprotection, APQ-PP/I = Positive Parenting/Involvement, APQ-CP = Corporal Punishment, APQ-Inc = Inconsistency, SF-12 = 12-Item Short-Form Health Survey, PSS = Perceived Stress Scale, NMRS = Negative Mood Regulation Scale, LOT-R = Life Orientation Test-Revised, RRS-A = Ruminative Response Scale-Abbreviated, and SAM = adjusted Stress Appraisal Measure.

Figure 2. *Mother-Adolescent Measurement Model*

Similarly, following respecification, the measurement model examining the father-adolescent relationship, which is shown in Figure 3, fit the data adequately (RMSEA = .08, CFI = .91, and PFI = .60). All indicator variables related significantly to their respective latent constructs in the father-adolescent model (all $p < .02$) with the exception of the Inconsistency subscale from the APQ ($p = .83$). However, the model did maintain adequate fit when the Inconsistency subscale remained in the analysis. Therefore, the Inconsistency subscale was left in the model as an indicator variable so that equitable comparisons could be made between the latent constructs in the mother-adolescent and father-adolescent models. Figure 5 depicts the structural model and path coefficients regarding the father-adolescent model. As noted above, the indictor variables for Parental Behaviors were constrained after initial analyses so that Positive Parenting/Involvement loaded positively onto the construct, and Corporal Punishment, Inconsistency, and Poor Monitoring loaded negatively onto the construct. All fit indices are detailed in Table 7 along with Chi-square values and degrees of freedom.

Note. *p* < .05, **p* < .01. Disturbances and measurement error effects are omitted for clarity. PBI-OP = Overprotection, APQ-PP/I = Positive Parenting/Involvement, APQ-CP = Corporal Punishment, APQ-Inc = Inconsistency, SF-12 = 12-Item Short-Form Health Survey, PSS = Perceived Stress Scale, NMRS = Negative Mood Regulation Scale, LOT-R = Life Orientation Test-Revised, RRS-A = Ruminative Response Scale-Abbreviated, and SAM = adjusted Stress Appraisal Measure.

Figure 3. *Father-Adolescent Measurement Model*

Summary of Structural Equation Models

Correlations among the latent constructs in each measurement model (Figures 2 and 3) were examined to test the study hypotheses. All hypotheses were supported in the measurement models. More specifically, Parental Behaviors related significantly to Adolescents' Cognitions in both models ($r = .57$, $p < .001$ for mothers and $r = .63$, $p < .001$ for fathers), with more positive parental behaviors associated with more adaptive cognitions. Parental Behaviors also related significantly to Adolescents' Stress/Health in both models ($r = .69$, $p < .001$ for mothers and $r = .50$, $p < .001$ for fathers), with more positive parental behaviors associated with healthier levels of stress/health in adolescents. Finally, Adolescents' Cognitions related significantly to Adolescents' Stress/Health in both models ($r = .78$, $p < .001$ for mothers and $r = .79$, $p < .001$ for fathers), with more adaptive cognitions associated with healthier states in stress/health.

Using the path coefficients for the manifest variables determined by the measurement models, the structural models were analyzed for data fit, for significant pathways among latent constructs, and for mediation effects. The mother-adolescent structural model, which is shown in Figure 4, fit the data adequately (RMSEA = .06, CFI = .94, and PFI = .77). Moreover, Mothers' Parental Behaviors predicted significantly both Adolescents' Cognitions (path coefficient = .57, $p < .001$) and Adolescents' Stress/Health (path coefficient = .36, $p < .003$). Likewise, Adolescents' Cognitions predicted significantly Adolescents' Stress/Health (path coefficient = .58, $p < .001$). In other words, all paths among latent constructs were significant in the mother-adolescent structural model. A nested model was used to test whether Adolescents' Cognitions mediate the relationship between Mothers' Parental Behaviors and Adolescents' Stress/health. A

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model including all three latent variables was analyzed in which the path from Mothers' Parental Behaviors to Adolescents' Stress/Health was constrained to zero. This constrained model fit the data adequately (RMSEA = .07, CFI = .93, and PFI = .77) and maintained significant paths from Mothers' Parental Behaviors to Adolescents' Cognitions (path coefficient = .63, $p < .001$) and from Adolescents' Cognitions to Adolescents' Stress/Health (path coefficient = .82, $p < .001$). Moreover, the difference in chi-square statistics between the constrained and non-constrained model was large ($\Delta\chi^2 = 7.66$, df = 1, $p < .01$), indicating a mediation effect. The significant relationship between Mothers' Parental Behaviors to Adolescents' Stress/Health in the structural model, however, indicated that Adolescents' Cognitions does not fully mediate this relationship. In other words, Adolescents' Cognitions partially mediates the relationship between Mothers' Parental Behaviors and Adolescents' Stress/Health in the mother-adolescent model.
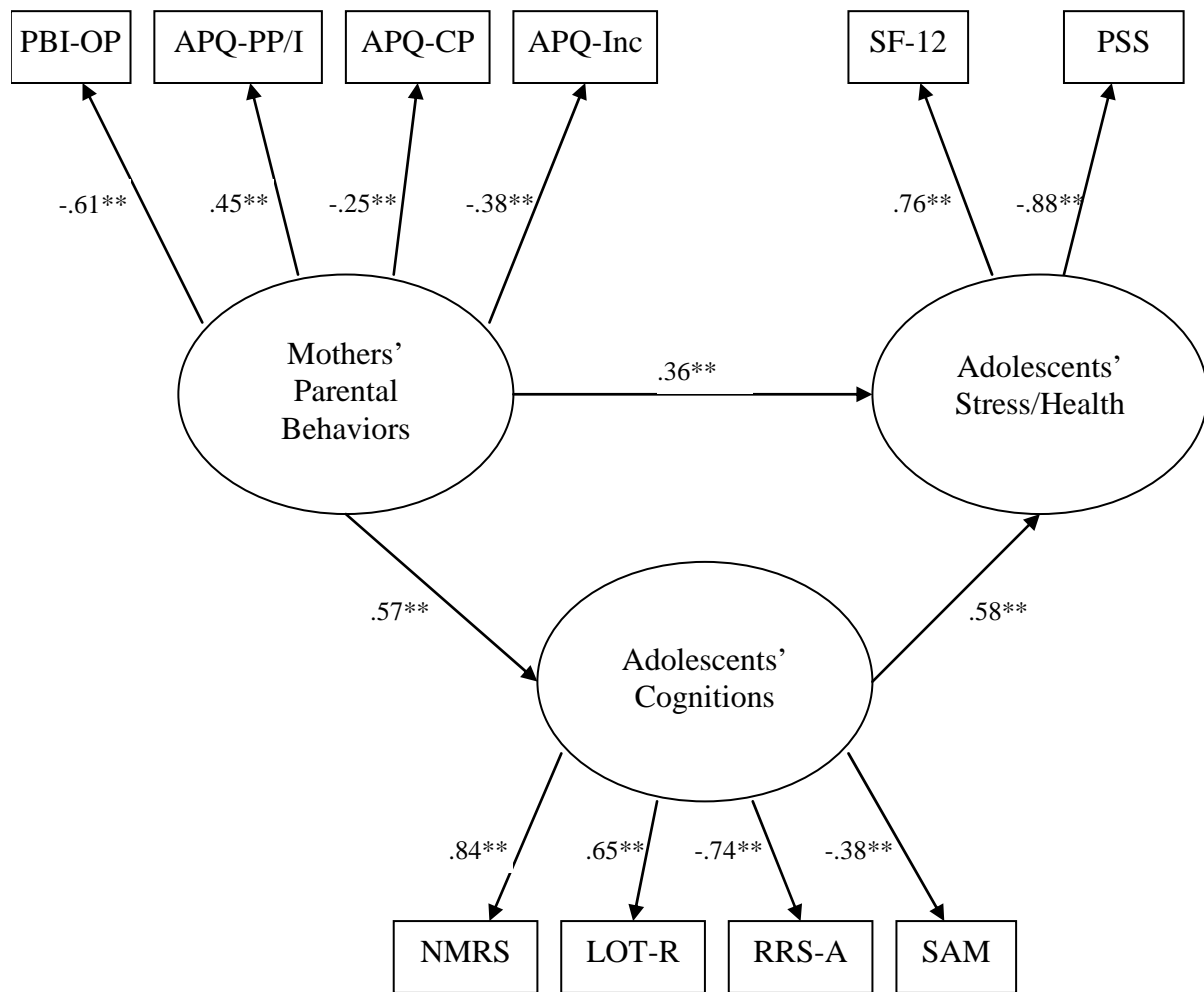
Note. *p* < .05, **p* < .01. Disturbances and measurement error effects are omitted for clarity. PBI-OP = Overprotection, APQ-PP/I = Positive Parenting/Involvement, APQ-CP = Corporal Punishment, APQ-Inc = Inconsistency, SF-12 = 12-Item Short-Form Health Survey, PSS = Perceived Stress Scale, NMRS = Negative Mood Regulation Scale, LOT-R = Life Orientation Test-Revised, RRS-A = Ruminative Response Scale-Abbreviated, and SAM = adjusted Stress Appraisal Measure.

Figure 4. *Mother-Adolescent Structural Model Predicting Adolescents' Stress/Health*

The father-adolescent structural model fit the data adequately (RMSEA = .07, CFI = .93, and PFI = .75). Fathers' Parental Behaviors did not predict significantly Adolescents' Stress/Health (path coefficient = .01, p = .98) but did predict significantly Adolescents' Cognitions (path coefficient = .63, p < .001). In addition, Adolescents' Cognitions predicted significantly Adolescents' Stress/Health (path coefficient = .78, p < .001). Compared to the measurement model, the significant relationship between Fathers' Parental Behaviors and Adolescents' Stress/Health in the measurement model became non-significant in the structural model. This finding indicates a mediating effect of Adolescents' Cognitions. In other words, Adolescents' Cognitions fully mediates the relationship between Fathers' Parental Behaviors and Adolescents' Stress/Health. Therefore, nested model tests of mediation were not conducted.
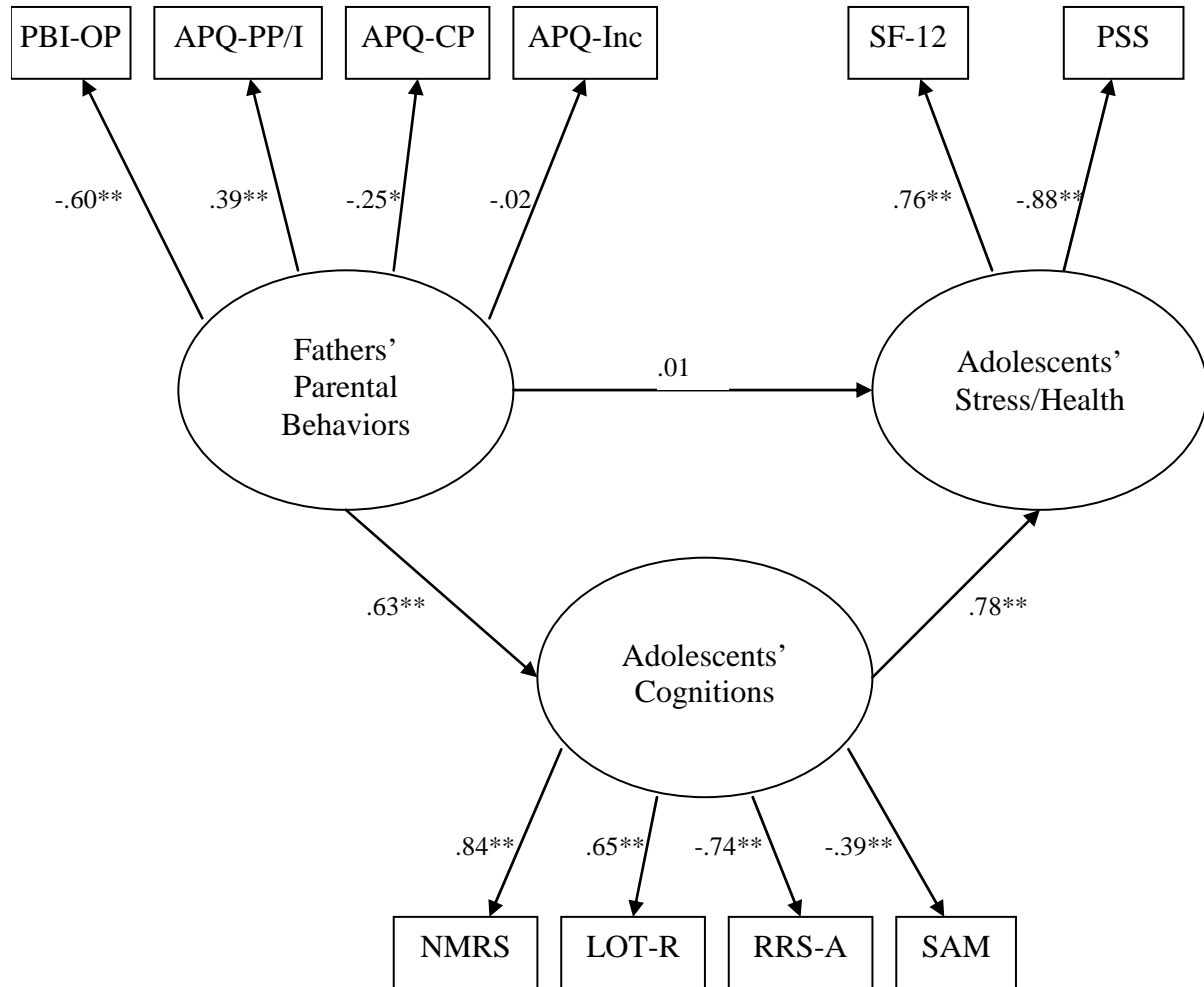
Note. *p* < .05, **p* < .01. Disturbances and measurement error effects are omitted for clarity. PBI-OP = Overprotection, APQ-PP/I = Positive Parenting/Involvement, APQ-CP = Corporal Punishment, APQ-Inc = Inconsistency, SF-12 = 12-Item Short-Form Health Survey, PSS = Perceived Stress Scale, NMRS = Negative Mood Regulation Scale, LOT-R = Life Orientation Test-Revised, RRS-A = Ruminative Response Scale-Abbreviated, and SAM = adjusted Stress Appraisal Measure.

Figure 5. *Father-Adolescent Structural Model Predicting Adolescents' Stress/Health*

In summary, both the mother-adolescent and father-adolescent models depicted in

Figures 4 and 5 fit the data adequately in support of the hypotheses. All paths among latent

constructs were significant in the mother-adolescent structural model. In addition, Adolescents'

Cognitions partially mediates the relationship between Mothers' Parental Behaviors and

Adolescents' Stress/Health, as Mothers' Parental Behaviors continues to have a unique and

significant relationship with Adolescents' Stress/Health. In contrast, the path from Fathers'

Parental Behaviors to Adolescents' Stress/Health became non-significant in the structural model

for fathers, indicating that Adolescents' Cognitions fully mediates the relationship between

Fathers' Parental Behaviors and Adolescents' Stress/Health. Fit indices for all models are

detailed in Table 7 along with Chi-square values and degrees of freedom

Table 7. *Fit Indices for Model Analyses*

Test	χ^2	*df*	RMSEA	CFI	PFI
Measurement Models					
Respecified Models					
Maternal Model	64.74	32	.08	.93	.61
Paternal Model	67.80	32	.08	.91	.60
Structural Models					
Hypothesized Models					
Maternal Model	64.74	40	.06	.94	.77
Maternal Nested Model	72.40	41	.07	.93	.77
Paternal Model	67.80	40	.07	.93	.75

Note. N = 159 for the maternal models; N = 154 for the paternal models; nested models testing mediation provided significant improvement in model fit according to the chi-square difference test ($\Delta\chi^2 = 7.66$, *df* = 1, *p* < .01).

CHAPTER FOUR: DISCUSSION

The current study examines relationships among parental behaviors, adolescents'
cognitions, and adolescents' stress/health. Results of this study generally support the current
body of literature. In particular, the findings of this study indicate that several parental behaviors
(e.g., overprotection, positive parenting/involvement) are correlated significantly with
adolescents' cognitions, such that more positive parenting is related to more adaptive cognitions.
Further, several parental behaviors (e.g., overprotection, positive parenting/involvement, poor
monitoring) are correlated with adolescents' stress/health in the hypothesized direction (i.e.,
more positive parenting is related to healthier states in adolescents' stress/health). Likewise, the
findings of this study suggest that cognitive variables (i.e., expectancy of mood regulation,
optimism, ruminative thinking, and perceived situational threat) are correlated significantly with
adolescents' stress/health (i.e., self-reports of perceived stress and overall health). These
relationships are in the predicted directions, such that more adaptive cognitions are related to
healthier states in stress/health. Thus, this study emphasizes the important relationships among
parental behaviors, cognitions, and stress/health for late adolescents.

Parental Behaviors in the Prediction of Stress/Health

Adding to the current body of literature, this study examines which parental behaviors are
most predictive of adolescents' stress/health. Findings from hierarchical regression analyses

indicate that, for both mothers and fathers, overprotection and poor monitoring are related to adolescents' perceived stress and overall health, even when other parental behaviors are considered simultaneously in the analysis. This finding suggests that parental overprotection and poor monitoring are the most salient predictors of adolescents' self-reported stress/health. Further, this finding is contrary to the study's hypothesis that positive parental behaviors, such as involvement and warmth, would account for the most variance in adolescents' stress/health. Previous research notes the relationship between negative parental behaviors, including punishment, inconsistency, and overprotection, in stress/health outcomes (Carrey et al., 1995; Fisher et al., 2000; Gottman & Katz, 1989; McCarthy et al., 2001; Sideridis & Kafetsios, 2008). However, a review of the current literature reveals that there is little research on the relationship between parental overprotection and *physical* health, as most research examines the relationship between parental overprotection and *mental* health (Hall, Peden, Rayens, & Beebe, 2004; Overbeek, ten Have, Vollebergh, & de Graaf, 2007). Moreover, there is little research examining the relationship between parental monitoring and either perceived stress or overall health, particularly when monitoring is assessed as supervision (i.e., a desirable behavior) rather than overcontrol (i.e., an undesirable behavior). The current study reveals the unique importance of overprotection and poor monitoring above other parental behaviors in relation to both perceived stress and overall health. The findings suggest that overprotection and poor monitoring in parents should be examined as possible target for change when using interventions to improve the stress/health outcomes for children, adolescents, and emerging adults.

Unfortunately, the current study did not provide a means of examining why parental overprotection and poor monitoring would be the most salient predictors of adolescents' stress/health. However, the current literature provides some possible directions that should be explored further in future studies. First, regarding parental overprotection, less parental control and overprotection may foster greater independence in children. For example, the Overprotection scale of the PBI assesses whether parents are making their children dependent on them or are allowing their children to make independent decisions. It may be that children who are given more independence develop subsequently a sense of confidence in their decisions and abilities (i.e., self-efficacy). Their self-efficacy then may serve as the important predictor of less perceived stress and better overall health. Such relationships are supported by previous research (Florian et al., 1995; Shelley & Pakenham, 2004; Taylor et al., 2003).

Second, regarding parental poor monitoring, it should be noted that parental poor monitoring is related to adolescents' stress/health but is not correlated with any adolescent cognitions in this study. This finding suggests that poor monitoring may be a unique parenting target for intervention and prevention in adolescents' stress/health, irrespective of adolescents' cognitions. Previous research indicates that parental monitoring is related significantly to adolescents' health behaviors (Markey et al., 2001), suggesting a more direct relationship between these variables. This possible explanation was not supported in the current study, however, due to the non-significant relationships between stress/health and health behaviors and between parental poor monitoring and health behaviors. There may be more sensitive measures of health behaviors (see below) that would reveal significant relationship among these variables.

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Therefore, this explanation cannot be ruled out based on the non-significant relationships in this study. It also may be the case that this relationship was not significant because the sample examined in this study were beginning their transition away from their families of origin (e.g., Arnett, 2000), resulting in more autonomy and less parental influence on the specific health behaviors measured for sleep, drug use, poor diet, and exercise. Future research should examine other possible mechanisms as well that could explain the relationship between parental poor monitoring and adolescents' stress/health.

Finally, the significant predictive value of parental overprotection and poor monitoring in adolescents' stress/health may be enhanced by cooperative or reciprocal suppression (Tabachnick & Fidell, 2001). Cooperative suppressor variables are correlated negatively with each other, as are parental overprotection and poor monitoring, and act to increase the relationship with the criterion variable in the presence of each other (Tabachnick & Fidell, 2001). In other words, after adjustments for the presence of each of these variables in the regression analysis, parental overprotection and poor monitoring may have an inflated relationship with overall perceived stress and with overall health. In addition, it may be the case that parental overprotection is related to parental poor monitoring, such that parents who are more overprotective may have higher levels of monitoring (i.e., less poor monitoring). These variables may have a unidirectional relationship, such that parents who monitor their children well are not necessarily overprotective. For example, it would be possible for parents to maintain knowledge of their children's whereabouts and activities (as assessed by the Poor Monitoring subscale of the APQ) without being controlling (as assessed by the Overprotection subscale of the PBI). In

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reverse, however, it is likely that parents who are controlling would know of their children's whereabouts and activities as part of that control. As a result, both overprotection and monitoring may account for significant variance in the regression analysis, but overprotection may be the underlying concept that drives the significant relationships.

Pathways of Relationship and Mediation Effects Among Latent Constructs

Also adding to the current body of research, this study examines mother-adolescent and father-adolescent path models and tests for mediational effects using structural equation modeling. This study indicates that the proposed model adequately fits the data for both mothers and fathers (see Figures 4 and 5). Across both mothers and fathers, positive parental behaviors are significant predictors of adaptive cognitions (e.g., expectancy of mood regulation, optimism, freedom from rumination, and perceived ability to cope), and adaptive cognitions are significant predictors of less perceived stress and better overall health. Although previous research indicates the importance of parental behaviors and cognitions separately in relation to stress/health, only a few studies examine these variables simultaneously (El-Sheikh & Harger, 2001; McCarthy et al., 2006). The current study provides evidence that both parental behaviors and cognitions are important in stress/health outcomes and that several types of parental behaviors and cognitions are important in these relationship pathways. Additionally, results of this study demonstrate that the parental behaviors of fathers, who are often underrepresented in the parenting literature (Phares, Fields, Kamboukos, & Lopez, 2005), are related significantly to adolescents' cognitions and stress/health.

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Unexpectedly, analyses of pathways among variables and constructs in this study indicates that blood pressure reactivity either is unrelated to adolescents' cognitions and stress/health or is related in the opposite direction than predicted. In particular, higher blood pressure reactivity for both systolic and diastolic blood pressure is related to *less* perceived stress. There is a substantial body of literature suggesting that blood pressure reactivity is usually associated with *higher* stress, even in children and adolescents (Ballard et al., 1993; Matthews et al., 1988; Wright et al., 1993). In addition, blood pressure reactivity is not related significantly to cognitions, including perceptions of threat regarding the stress task (i.e., the TSST). The current literature indicates that blood pressure reactivity should correlate with higher perceptions of threat, inability to cope, and ruminative thinking (Brosschot et al., 2006; Ursin & Eriksen, 2004). It is not clear why blood pressure reactivity did not relate to the other study variables in the predicted directions, as all data was screened for errors and for correct computations of subscales to ensure that the unexpected correlations were not spurious.

The non-significant relationships may be related to the finding that participants in this study report higher expectation of mood regulation, more optimism, greater self-efficacy, less overall stress, and better overall health than average participants in normative samples, even when normative samples consist of college students (Catanzaro & Mearns, 1990; Cohen et al., 1983; Schwarzer et al., 1999). Thus, it may be the case that the current sample represents an unusually high-functioning group of individuals and, therefore, may show different patterns of blood pressure reactivity than a more diverse sample might show. The current findings also may result from biases in self-reports or a lack of definite association between self-reports of stress

and physiological responses. For example, although many studies find relationships between blood pressure reactivity and self-report measures, some studies find that self-reports of stress do not correspond with physiological measures of their stress (Nolen-Hoeksema & Morrow, 1991; Walco et al., 2005).

These previous findings may explain the overall lack of significant correlations between blood pressure reactivity and other study variables; however, this would not explain why blood pressure reactivity is related significantly to *lower* perceived stress in this study. Future research needs to examine possible moderators that could explain why blood pressure reactivity is related positively to stress in some samples but not others. It may be the case that variables not measured in this study influence how blood pressure reactivity relates to perceived stress. For example, there may be personality or temperament variables, such as level of sensation seeking, that could moderate the relationship between cognitions and blood pressure reactivity such that some individuals do not respond with as much blood pressure reactivity when they perceive threat as other individuals.

Another finding in the path analysis that is worthy of note is the low, albeit significant, correlation of parental corporal punishment with the construct of Parental Behaviors. This relatively small relationship may be due to the specificity of corporal punishment as a discipline method. In other words, parents' use of physical discipline with their children is a narrow category of parental behaviors (particularly for adolescents who are attending college), as compared to overprotection, which includes a variety of parental behaviors such as intrusiveness, supervision, control, and autonomy granting. Moreover, assessing whether parents use corporal

punishment does not provide a context in which that corporal punishment is used. In other words, children whose parents strike them abusively out of rage are likely to have more negative outcomes than children whose parents spank them in a prescriptive fashion as a form of discipline. Thus, the narrow concept of corporal punishment and lack of information on the context of its use may account for the low correlation between corporal punishment and the Parental Behaviors construct.

Regarding mediation effects, the path analyses reveal that adolescents' cognitions partially mediate the relationship between Mothers' Parental Behaviors and Adolescents' Stress/Health and fully mediate the relationship between Fathers' Parental Behaviors and Adolescents' Stress/Health. Some studies examine mediational effects and, similarly, support the mediating role of cognitions in stress/health outcomes (El-Sheikh & Harger, 2001; McCarthy et al., 2006). Some studies, however, neglect to examine the role of cognitions in the relationship between parental behaviors and stress/health outcomes (Fisher et al., 2000; Russek & Schwartz, 1997a). The findings of the current study emphasize the importance of cognitions in the relationship between parental behaviors and stress/health. Moreover, these findings suggest that adolescents' cognitions may be a more important target of intervention than the parental behaviors of mothers and fathers. When parental behaviors are the direct target of interventions, however, it may be more important to focus on maternal parental behaviors rather than paternal parental behaviors, as mothers' behaviors appear to maintain a significant relationship to adolescents' stress/health outcomes in the context of adolescents' cognitions. Using experimental designs, future research should examine whether changes to mothers and fathers' parenting

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behaviors will impact their children's stress/health and whether other combinations of parental variables (e.g., marital discord, parental stress) may serve as better indicators of constructs related to parental variables.

<p style="text-align:center">Limitations</p>

Findings from this study need to be considered within the context of its limitations. First, this study has limited generalizability. Participants in this study range in age from 18- to 20-years and are students at a large Southeastern state university. Moreover, they report higher expectation of mood regulation, more optimism, greater self-efficacy, less overall stress, and better overall health than average. Therefore, the findings from this study may not apply to other age groups, a more demographically diverse sample of the population, or a more typical sample of respondents. Second, all of the measures included in the final analyses are based on self-reports. Particularly regarding adolescents' recollections and perceptions of their parents' behaviors during childhood, self-report measures may not necessarily provide accurate indications of the targeted variables. Third, parent participation is unfortunately low in this study, especially given that parents were provided with an incentive for their participation. This lack of participation resulted in the omission of several parental variables (e.g., marital discord ratings, parents' perception of their adolescents). Particularly for structural equation modeling, in which path coefficients change readily based on the constellation of variables that are entered in the model, it may be the case that the models supported by this study would change significantly if other parental variables were explored. In addition to the lack of parent participation, there may

be other pertinent variables not assessed in this study that would change the results significantly, such as alternative measures of stress/health. Fourth, this study is limited by its correlational design, which cannot determine causal relationships among variables. Finally, for this study, an exploration of currently available measures reveals that most measures of health behaviors do not provide analyses of validity or reliability and generally focus on a limited range of health behaviors (e.g., drug-use only, exercise only). Therefore, the finding of a non-significant relationship between health behaviors and stress/health may have been limited by the psychometrics of the health behavior measures.

Future Directions

Additional research is needed to address the limitations of this study and to examine related variables not assessed in this study. Specifically, future studies should assess a wider sample of the population to improve generalizability. In addition, future research will need to incorporate parental ratings of their own behaviors as well as observations of parental behaviors to determine whether actual parental behaviors or perceptions of parental behaviors (i.e., self-reports) are most important in predicting stress/health outcomes. Furthermore, research is needed to examine a broader range of parental variables, especially marital discord and parental perceptions of children, to confirm which variables are the most important predictors of stress/health. Additionally, future research will need to examine this set of variables in different age groups, as certain variables may be more important at different developmental stages. As mentioned previously, future research also should examine the reasons that parental

overprotection and poor monitoring are the most salient predictors of stress/health. For example, it may be that less overprotection from parents fosters greater self-efficacy in children, and it may be that better parental monitoring is related to better health behaviors in children.

In addition, it may be important for future research to examine bi-directional effects and family fit. In other words, child temperament may influence parental behaviors or create different interpretations of parental behaviors. Similarly, future research should examine possible differences across male and female adolescents. Just as there are differences in the relationships among variables by parent gender (i.e., mothers and fathers), there also may be different correlations among these variables depending on adolescents' gender (i.e., sons and daughters), as well as interaction effects (i.e., sons-mothers, sons-fathers, daughters-mothers, and daughters-fathers). Differences across male and female participants were not examined in the current study to due disproportionately low levels of male participation (i.e., only 46 male participants), resulting in insufficient power for the required statistics. Finally, experimental and longitudinal studies should examine the possibility of causal relationships between parental behaviors, adolescents' cognitions, and adolescents' stress/health, as well as the predictive value of parental behaviors and cognitions in the long-term stress/health outcomes of children, adolescents, and emerging adults.

Implications and Conclusions

Despite the limitations of this study, the findings lend support to the importance of adolescents' cognitions as a starting point in prevention and intervention efforts for stress/health

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outcomes. Experimentally designed studies should examine whether changing expectancies of emotional regulation, optimism, ruminative thinking, and situation-specific appraisals causes long-term changes in stress/health outcomes. In addition, findings from this study suggest that parental overprotection and poor monitoring may be the most important parental behaviors to address regarding stress/health and that mothers' behaviors may have a significant impact on stress/health outcomes beyond the role of adolescents' cognitions. This study serves as an initial indication that it could be worthwhile to test whether changes in these two parental behaviors can cause changes in the long-term stress/health outcomes of children, adolescents, and emerging adults. If a causal relationship were found, such a finding could guide practitioners who are working with families as part of prevention and intervention programs for improving health problems.

Overall, the results of this study suggest that more positive parental behaviors predict more adaptive cognitions in adolescents and more adaptive cognitions predict healthier states in adolescents. Furthermore, adolescents' cognitions fully mediate the relationship between paternal behaviors and stress/health outcomes in a father-adolescent model examining these variables and partially mediate the relationship between maternal behaviors and stress/health outcomes in a mother-adolescent model examining these variables. Among the parental behaviors that are examined, the most predictive variables of adolescents' perceived stress and overall health are parental overprotection and poor monitoring. These findings suggest that research is needed to examine parental overprotection and monitoring as important distal

variables in adolescents' stress/health and adolescents' cognitions as a more salient and

immediate predictor of adolescents' stress/health.

APPENDIX: IRB APPROVAL LETTER

University of Central Florida

Office of Research & Commercialization

February 13, 2007

Kimberly Renk, Ph.D. &
Reesa Donnelly
University of Central Florida
Department of Psychology
PH 409G
Orlando, FL 32816-1390

Dear Dr. Renk & Ms. Donnelly:

With reference to your protocol #07-4181 entitled, "Parental Influences and Cognitive Mediators of Adolescents' Stress and Health," I am enclosing for your records the approved, expedited document of the UCFIRB Form you had submitted to our office. **This study was approved on 2/13/2007. The expiration date for this study will be 2/12/2008.** Should there be a need to extend this study, a Continuing Review form must be submitted to the IRB Office for review by the Chairman or full IRB at least one month prior to the expiration date. This is the responsibility of the investigator.

Please be advised that this approval is given for one year. Should there be any addendums or administrative changes to the already approved protocol, they must also be submitted to the Board through use of the Addendum/Modification Request form. Changes should not be initiated until written IRB approval is received. Adverse events should be reported to the IRB as they occur.

Should you have any questions, please do not hesitate to call me at 407-823-2901.

Please accept our best wishes for the success of your endeavors.

Cordially,

Joanne Muratori
(FWA00000351 Exp. 5/13/07, IRB00001138)

Copies: IRB File

JM:jt

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