THE ROLE OF PARENTAL AUTONOMY SUPPORT IN THE MOTIVATION OF THE HEALTH BEHAVIORS OF DIET AND EXERCISE IN OLDER ADOLESCENTS

by

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THE ROLE OF PARENTAL AUTONOMY SUPPORT IN THE MOTIVATION OF THE HEALTH BEHAVIORS OF DIET AND EXERCISE IN OLDER ADOLESCENTS

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ABSTRACT

Diseases that were once considered to be unique to the adult population are now being diagnosed in childhood and adolescence. Health behaviors established during adolescence are believed to influence attitudes and motivations toward health practices well into adulthood. Poor dietary choices and decreased exercise frequency are believed to have a direct influence on the rising adolescent obesity rate and the premature onset of many chronic health conditions. Since the family unit is the primary source of socialization, parental interactions are believed to persuade adolescent attitudes, motivations, and behaviors through the negotiation and renegotiation of the adolescent’s autonomy development. Adolescent autonomy is reflected in adolescent self-determination; self-determined adolescents tend to make choices that are not due to outside pressures. The purpose of this study was to examine the role of parental autonomy support in the motivation of the health behaviors of diet and exercise in older adolescents and to evaluate the significance of adolescent self-determination as a mediator of the association between parental autonomy support and adolescent motivation for diet and exercise behaviors. A total of 132 freshman and sophomore college students completed a set of questionnaires. In general, adolescents viewed mothers as more autonomy supportive than fathers ($t = 2.32, p = .02$). Hierarchical multiple regression was utilized to answer the study hypotheses. Pearson’s correlation analysis was conducted to determine influential demographic variables. Significant
demographic variables were controlled in each regression model. Parental autonomy support was not significant in the prediction of the adolescent’s diet or exercise behaviors; however, parental autonomy support was predictive of the adolescent’s self-determination ($p < .001$). Adolescent self-determination was predictive of the adolescent’s motivation for diet ($p < .05$) but not exercise and suggested that the importance of healthy dietary patterns may be more internalized than the importance of exercise in the older adolescent population. The findings of this study suggested that parental autonomy support continues to influence adolescent internalization of attitudes and behaviors throughout adolescence; however, more general parental autonomy support may not be a primary predictor of motivation for specific health behaviors in older adolescents.

Key Words: Parental autonomy support, self-determination, adolescent health behaviors
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CHAPTER 1
INTRODUCTION

Diseases that have historically affected adults are now being diagnosed in a much younger age group. Type 2 diabetes, hyperlipidemia, hypertension, and early indicators of coronary heart disease are currently being recorded in record numbers in the adolescent population (Ogden et al., 2006). Long-term consequences of premature onset of disease are unclear but are believed to significantly affect quality and quantity of life (Hassan, Joshi, Madhavan, & Amonkar, 2003; Kushner & Foster, 2000; Must & Strauss, 1999).

Research suggests there may be a relationship between many chronic diseases and health behaviors related to diet and exercise (Lean, Thang, & Seidell, 1999; Must & Strauss, 1999). Empirical evidence also indicates that health behaviors adopted in late adolescence are predictive of long-term health behaviors and attitudes (Gordon-Larsen, Nelson, & Popkin, 2004; Hansell & Mechanic, 1990; Hedberg, Bracken, & Stashwick, 1999). Therefore, the examination of health behaviors related to diet and physical activity in the adolescent population is essential.

In comparison with other developmental stages, adolescence has traditionally been viewed as a time of few health concerns (Millstein, 1989; Spear & Kulbok, 2001). Children are the only segment of the population to have mortality rates lower than those of the adolescent population (National Vital Statistics Report, 2009). However, increases
are being reported in adolescents’ hospitalizations and in their rates of chronic disease and disability (Millstein; Must & Strauss, 1999).

Background

The development of poor health behaviors such as smoking, minimal exercise, poor nutrition, lack of sleep, and alcohol consumption is often initiated during adolescence. Instigation of these health-related behaviors during this stage of life is often predictive of lifelong patterns that increase the adolescent’s risk of premature onset of chronic disease and death (Hansell & Mechanic, 1990; Hedberg et al., 1999). In particular, the alarming rate of obesity-related illnesses has led researchers to hypothesize that this generation of adolescents may be the first to have a life span shorter than that of their parents (Melnyk, Small, & Moore, 2008).

College is often the environment in which older adolescents first experience independence from parental oversight (Megel et al., 1994; Sax, 1997). As a result, the university setting typically affords students greater autonomy; however, this enhanced liberty may be accompanied by new stressors associated with altered daily life structure and with increased personal responsibility (Lawrence & Schank, 1993; Sheldon, 2006). Additionally, the physical, developmental, and social changes that transpire during this stage of development can play a role in the shaping of lifelong health-promoting behaviors (Story, Neumark-Sztainer, & French, 2002).

According to Anderson, Shapiro, & Lundgren, (2003) significant contributors to freshman weight gain include environmental and lifestyle changes that occur during the college transition, such as lack of required school-structured physical activity, all-you-
can-eat dining halls, unrestricted availability of junk food, and altered sleeping patterns. Obesity is currently considered the most prevalent nutritional disease of the adolescent population (Ogden, Flegal, Carroll, & Johnson, 2002). Research results indicate that the drastic rise in childhood and adolescent obesity is the common denominator of the early onset of many chronic diseases and premature disease complications in this population (CDC, 2003; Must & Strauss, 1999). Despite the severe consequences of the obesity epidemic in this population, pediatric and adolescent obesity rates continue to increase. The prevalence of overweight female children and adolescents in the U.S. increased from 13.8% in 2000 to 16.0% in 2004 and that of overweight male children and adolescents in the nation increased from 14% to 18% in the same period; minority populations were disproportionately affected (Ogden et al., 2006).

Physical inactivity, sedentary lifestyle, and poor nutritional choices are precursors to obesity (Arluck, Branch, Swain, & Dowling, 2003; Gortmaker, Must, Sobol, Peterson, Colditz, et al., 1996). A wide range of individual, familial, environmental and societal factors are believed to be linked to these precursors; however the parental role remains the most influential during the adolescent years (Hansell & Mechanic, 1990; Story, et al., 2002).

Significance

Adolescence is recognized as one of the most complex and demanding periods of life (Peterson & Leffert, 1995). The developmental and social transitions that occur during the adolescent years can impact short- and long-term health (Story et al., 2002). The developmental tasks of advancing autonomy and gaining greater independence,
occur concurrently with the need for social acceptance in the older adolescent and all of these factors must be considered when motivation for behaviors is being examined (Dacy, Kenny, & Margolis, 2004; Hansell & Mechanic, 1990).

The role of parents in motivating behavior has gained much interest over the past 2 decades. Because the home is the prime socialization arena for both children and adolescents, parents maintain the greatest influence in the lives of their offspring until adulthood (Bourdeaudhuij & Van Oost, 1998; Hansell & Mechanic, 1990). Adolescent perceptions of support from their parents have been linked to positive outcomes. Increased perceptions of parental autonomy support in this population were linked to higher self-actualization and vitality whereas lower perceptions of parental autonomy support were associated with greater separation-individuation difficulty (Robbins, 1994). Furthermore, examination of the parent-adolescent relationship indicates that a relationship exists between perceived parental autonomy support and social functioning, academic motivation, and possible health behaviors (Grolnick, Ryan, & Deci, 1991; Niemiec, Lynch, Vansteenkiste, Bernstein, Deci, et al., 2005; Williams, Cox, Kouides, & Deci, 1999).

The influence of the family has been recognized as playing a significant part in shaping patterns of behavior, including the health behaviors of teens and young adults. Internalization of healthy familial practices and beliefs is likely to continue and may become solidified during later adolescence if proactive health behaviors by the family are demonstrated in an autonomy-supportive manner (Chirkov, Ryan, Kim, & Kaplan, 2003). In addition, internalization of core beliefs has been linked to more positive and adaptive coping, as well as to enhanced well-being, in this population (Hayamizu, 1997).
However, the role of parenting styles in motivation for health behaviors in late adolescence has received little attention.

Self-determination theory (SDT) has been tested by health care professionals as a possible means of assisting individuals with making better health decisions and incorporating those practices as a part of daily life. Because SDT involves teaching, encouraging, and informing patients in an autonomy-supportive manner, its framework has provided health care workers insight into ways of supporting the internalization of newly learned behaviors for long-term health benefits (Williams et al., 1999; Williams, Gagne, Ryan, & Deci, 2002; Williams, Freedman, & Deci, 1998).

Results of this study provide information about the motivation of older adolescents for particular health behaviors and about the role of parents in supporting the autonomy necessary for these adolescents’ self-motivation. Current research regarding adolescent diet and exercise practices has been directed toward education and behavior change; however, and increased understanding of the adolescents’ motives for their behavior and of the persons capable of influencing their motivation may guide the development of programs that help parents promote motivation for lifelong health strategies. Results from numerous studies (Williams et al., 2002; Williams et al., 1998; Zeldman, Ryan, & Fiscella, 2004) have supported inclusion of autonomy support as an antecedent in the motivation of health behaviors and the prediction of health behavior change in the adult population but the role of parental support in motivation of older adolescents has not been examined. Significant findings regarding the proposed relationships could extend previous work to the older adolescent population and to specific health behaviors.
Purpose

The purpose of this study was to evaluate the role of parental autonomy support in motivating the health behaviors of diet and exercise in adolescents who are 18-20 years of age. An additional purpose of the study consisted of assessing the mediating effects of adolescents’ self-determination on their motivation for the health behaviors of diet and exercise.

Research Questions/Hypotheses

1. Is there a positive relationship between older adolescents’ perceived parental autonomy support and their motivation for dietary behaviors?

   *Hypothesis 1*: Older adolescents’ perceived parental autonomy support is positively related to these adolescents’ motivation for healthy dietary behaviors.

2. Does parental autonomy support impact adolescent self-determination and does adolescent self-determination impact these adolescents’ motivation for healthy dietary behaviors?

   *Hypothesis 2*: Parental autonomy support positively affects adolescent self-determination which then positively affects motivation for dietary behaviors.

3. Is there a positive relationship between older adolescents’ perceived parental autonomy support and their motivation for exercise?

   *Hypothesis 3*: Older adolescents’ perceived parental autonomy support is positively related to these adolescents’ motivation for exercise behaviors.

4. Does parental autonomy support impact adolescent self-determination and does adolescent self-determination impact these adolescents’ motivation for healthy exercise behaviors?
Hypothesis 4: Parental autonomy support positively affects adolescent self-determination which then positively affects motivation for exercise behaviors.

Definition of Terms

For the purpose of the study these terms are conceptually defined as follows:

Parents were defined as the primary adult figures in the adolescent’s life who provide financial, emotional, and physical support (Bengston, Acock, Allen, Dilworth-Anderson, & Klein, 2005). This term can include biological or adoptive parents as well as step parents but may also consist of grandparents serving as the adolescent’s primary guardian.

Parental autonomy support refers to the support of the adolescents’ enactment of their own interests and personal values. Parents who are autonomy supportive provide options and meaningful justification during decision making and acknowledge the perspective of the adolescent while minimizing use of demands and/or pressures (Deci, Eghrari, Patrick, & Leone, 1994; Deci & Ryan, 2002). Parental autonomy support was operationalized as the participant’s score on the Parental Autonomy Support subscale of the Perception of Parents Scale (POPS; Robbins, 1994).

Self-determination was defined as the degree to which an individual’s decisions are the result of his or her own autonomous interests and desires. Behaving in an autonomous or self-determined manner means being self-governing and the originator of one’s own actions (Ryan & Deci, 2000; Deci & Ryan, 2002). Self-determination was operationalized as the participant’s score on the Self Determination Scale (Sheldon, Ryan & Reis, 1996).
Motivation for adolescent dietary behaviour was defined as the degree to which an adolescent’s motivation for their dietary behavior is autonomous or self-determined (Deci, & Ryan, 2000). Motivation for dietary behavior was operationalized as the participant’s score for dietary choices on the Treatment Self Regulation Questionnaire (TSRQ; Ryan & Connell, 1989).

Motivation for adolescent exercise behaviour was defined as the extent to which the adolescent’s motivation for physical activity is self-determined (Deci & Ryan, 2000). Motivation for exercise behavior was operationalized as the participant’s score for exercise behaviors on the TSRQ (Ryan & Connell, 1989).

Older adolescent was defined as an individual 18-20 years of age who is transitioning toward more adult roles (i.e., living outside the parental residence, obtaining employment) or demonstrating increasing independence (e.g., more independent decision making, less parental monitoring; Petersen & Leffert, 1995) and who was entering the first or second year of college.

Family structure was defined as the composition and organization of the family (Kristjanson, 1992). In this study, family structure is the participant’s indication of the structure of the family of origin and was determined by his or her completion of a demographic questionnaire developed for the study.

Socioeconomic status (SES) was defined as the family’s relative economic and social ranking in society and was operationalized as the approximate annual income for the family (Adler & Newman, 2002). SES was determined by completion of the Hollingshead Index (Hollingshead, 1965).
Theoretical Framework

An Overview of SDT

SDT is the product of 3 decades of research developed to understand human behavior. A basic premise of SDT is that all persons inherently strive to fulfill the basic psychological needs of autonomy, relatedness, and competence. Activities and social contexts that assist in achievement of any or all of the basic needs are expected to be sought out and continued (Deci & Ryan, 2000). The most basic assumption of SDT is that “all individuals have natural, innate, and constructive tendencies to develop an ever more elaborated and unified self…as well as forge interconnections among aspects of their own psyches as well as with other individuals and groups in their social worlds” (Deci & Ryan, 2002, p. 5). This underlying premise recognizes social environment as instrumental in behavior and is believed to have the power to nurture and allow growth or to negate and fragment the process.

Figure 1. Conceptual model for hypothesized relationships based on Self-Determination Theory.

The foundation of SDT is the belief that all humans have the psychological needs of autonomy (directing one’s own behavior), competence (feeling effective in one’s continuous interaction with social environment and decision making), and relatedness (feeling connected with and cared for by others) (Deci & Ryan, 2002).
Autonomy, which is recognized as the most significant psychological need, is at the core of SDT. The fulfillment of these basic underlying needs provides the foundation for understanding human behavior. Social environments that support and allow growth of the three basic needs are predicted to assist with healthy functioning, whereas social environments that conflict with the basic needs are viewed as being antagonistic and as having the capability of disrupting growth and stability. In addition, environments that allow for an increase in or further development of any of the three psychological needs are believed to enhance the individuals’ self-determination and, in turn, to support their ability to make positive choices in an effort to improve their own health and happiness. “Self-determination theory focuses on the dialectic between the active, growth-oriented human organism and social contexts that either support or undermine people’s attempt to master and integrate their experiences into a coherent sense of self” (Deci & Ryan, 2002, p. 27). A key social environment concept which is responsible for enhancing self-esteem is autonomy support.

The basic psychological needs are viewed as universal and are believed to be innate requirements for each individual. “In humans, the concept of psychological needs further suggests that, whether or not people are explicitly conscious of needs as goal objects, the healthy human psyche ongoingly strives for these nutriments, and when possible, gravitates toward situations that provide them” (Deci & Ryan, 2002, p. 7).

Motivation and SDT. Essential to SDT is the distinction between two types of motivation: autonomous and controlling. The two types of motivation are viewed as if on a continuum and represent an individual’s motivation for a behavior. This continuum is referred to as the perceived locus of causality (PLOC; Ryan & Connell, 1989). Intrinsic
motivation (autonomous motivation) is at one end of the continuum and represents an individual’s engaging in a behavior because it satisfies personal goals and assists in the fulfillment in at least one of the three basic needs: autonomy, competence, and relatedness. Adjacent to intrinsic motivation lies identified regulation, which represents motivation for behavior based on personally relevant outcomes. The third construct on the continuum, introjected regulation, represents behavior that is carried out as a result of internal pressures or fears. The polar opposite of intrinsic motivation is external regulation. External regulation indicates an individual’s participation in a behavior as a result of external pressures or forces. It is believed, that if given the proper support, behaviors can be internalized, move along the continuum, and may eventually become intrinsically motivated. Self-determined or autonomous behavior is believed to be founded on the process of internalization and is reflective of the degree to which an individual’s basic psychological needs are fulfilled (Deci & Ryan, 1985; Ryan & Deci, 2000b).

Parental autonomy support and SDT. Research over the past 2 decades has revealed conceptual insights into the manner in which parents guide their child’s decision-making process. Autonomy support is a construct developed within the SDT and is defined as the methods undertaken in an effort to support the autonomous actions of an individual (Deci & Ryan, 2002). In SDT, it is postulated that when parents are more supportive of their child’s autonomy, they tend to value the child’s perspective when making decisions and to encourage their children to work toward solving their own problems. When parents are autonomy supportive in their interactions, they are also less likely to employ control tactics or engage in manipulation. Autonomy-supportive parents
attempt to foster autonomous self-regulation by their offspring instead of requiring mere compliance with rules.

Contextual situations that allow for the display of autonomy and competence enhance satisfaction of need and increase intrinsic motivation; as a result, the individual can become more engaged. Situations that suppress the fulfillment of the need of autonomy and/or competence have the potential to ignite negative reactions, conscious or otherwise, by the individual. Support for the adolescent’s autonomy fulfillment influences the adolescent’s general self-determination in life decisions, including those regarding his or her health. Autonomously regulated activities are far more beneficial than those have been found that are performed because of pressures, rewards, or feelings of control. People have the unconscious, innate need to feel in charge of their lives and to believe that they possess the knowledge and skill required to direct their life course along a positive and fulfilling path. The theory postulates that the greater the fulfillment of the basic needs, the more actively engaged the person will become in the activity or situation (Deci, 1975; Deci & Ryan, 1985). According to the model, factors that enhance an individual’s self-determination, such as parental autonomy support, are believed to positively influence decisions impacting quality of life.

Health is recognized as an important construct for adolescents, and more importance is attributed to health-related issues by adolescents than is recognized by most adults; however, adolescents’ concerns about health are broader than those considered by adults and are not limited to those related to chronic illness (Millstein, 1989). The conceptualization of health and of health behaviors differs significantly between younger
and older adolescents. Older adolescents are able to differentiate between health and illness (Millstein & Irwin, 1987; Rew, 2005).

Based on the propositions and assumptions underpinning the framework (Figure 1), it is hypothesized that the level of parental autonomy supportiveness perceived by the adolescent influences the adolescent’s motivation for health behaviors, specifically the behaviors of dietary choices and exercise practices. In addition, it is also hypothesized that parental autonomy support positively affects adolescent self-determination which then positively affects motivation for dietary/exercise behaviors.

Assumptions

1. All persons inherently strive to fulfill the basic psychological needs: autonomy, relatedness, and competence (Deci & Ryan, 1985).

2. Autonomy is the primary developmental task in the adolescent population that is completed when the adolescent leaves the parental residence and/or assumes primary responsibility for themselves (Spear & Kulbok, 2004).

3. Behaviors initiated as a result of true interest or motivation from within are more likely to be embraced and continued (Ryan & Deci, 2000b).


5. Adolescents have the ability to become active participants in their health decisions and behaviors (Manganello, 2008).
Summary

Lifelong diseases and premature disease complications are increasing in the adolescent population. Because parents remain key socializing agents for their children throughout adolescence (Bourdeaudhuij & Van Oost, 1998; Hansell & Mechanic, 1990), it is essential that researchers include parental behaviors and attitudes when investigating adolescent health practices. SDT provides empirical support for the evaluation of parental autonomy support and of its potential influence on the motivation for health behaviors of their adolescents.
CHAPTER 2
REVIEW OF LITERATURE

Late adolescence and young adulthood are recognized to be pivotal developmental periods during which foundational life strategies are initiated. As adolescents mature, they begin to make choices and to engage in a variety of activities that influence their life course. As students complete their high school education, they are faced with numerous decisions and challenges. Erickson (1968) identified the major developmental tasks of adolescence as a sense of mastery, identity, and intimacy. Additional developmental challenges faced by older adolescents include development of autonomy, establishment of adult and/or sexual relationships, and identification of a career path (Eccles et al., 1993; Kroger, 2007).

Parent-child relationships are related to adolescent well-being. Maintaining a strong bond to their family remains important for adolescents as they develop into young adults. Conflicts that commonly occur during early and middle adolescence relate to the teen’s need for advancing autonomy; however, familial relationships commonly improve as the adolescent matures and is eventually granted greater independence and autonomy (Roberts & Bengton, 1996).

The recognition that adolescent health attitudes and behaviors are predictive of lifelong health patterns highlights the importance of adolescent motivations for their health practices. A vast amount of literature exists that explores various aspects of parental attitudes and practices as well as the influence of these attitudes and practices on
adolescent psychosocial outcomes; however, few studies have examined the ways in which parenting behaviors impact adolescent motivation for health behaviors. In addition, a limited number of studies have explored the impact of fulfillment of psychological needs on motivation for behaviors in the adolescent population. This review of literature, which followed the method of integrative review proposed by Whittemore and Knafl (2005), summarizes and evaluates studies examining parental autonomy support, self-determination, and motivation for health behaviors in the adolescent population. The review is organized into discussions of each of the three constructs and is further structured based on identified themes within each construct. Tables 1 through 6 illustrate each study’s purpose, population, conceptual framework, and significant findings related to each construct.

The inclusion criteria for selecting studies were that the study specifically identified and evaluated one of the concepts of this review: parental autonomy support, self-determination, and adolescent motivation for health behaviors. The integrative review process was identical for all constructs and was based on methodology recommended by Whittemore and Knafl (2005). The process began with a search of published studies through the following databases: Academic Search Premier, Cumulative Index to Nursing and Allied Health Literature, MEDLINE, Health Source: Nursing/Academic Edition, and PsycINFO. The databases were limited to peer-reviewed research publications in English. In addition, only articles specifically examining adolescents and young adults (aged 12-25) were included. Age parameters were based on the goal of gathering and comparing findings on developmental processes, attitudes, and motivation occurring across time during the adolescent and young adulthood periods. In
cases in which the age range extended to participants more than 25 years of age, the study was included only if the mean age of the sample was within review parameters. Key search terms were identified for each concept and are defined in the following sections. The review included studies published from 1993 through July 2008. The search of relevant research studies by computer database was later supplemented by journal hand searching. Findings related to the three constructs, limitations of the studies, and directions for future research are discussed.

Parental Autonomy Support

The search for literature related to parental autonomy support began with computerized databases as described. Key search terms included parental autonomy support, autonomy support and parents, and adolescents. The initial search yielded 21 publications. One study (Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005) was excluded because the mean age was less than 12 and 6 additional studies (Assor, Roth, & Deci, 2004; Hale, Engels, & Meeus, 2005; Kasser, Ryan, Zax, & Sameroff, 1995; Ryan, Stiller, & Lynch, 1994; Slicker, 1998; Smits et al., 2007) were excluded because they either failed to evaluate parental autonomy support as a separate construct or were conceptually incongruent with the aims of the current study. Two studies (Abad & Sheldon 2008; Gagne, 2003) did not provide the participants age range; however, because the participants were identified as undergraduate college students, the two studies were included. A total of 14 studies met the specified inclusion criteria.

Because some conceptual overlap was found between authoritative parenting and parental autonomy support literature, additional terms (parenting style and authoritative
parenting) were added to the search. The new search yielded an additional 15 studies; however, only 2 studies (Purdie, Carroll, & Roche, 2004; Suldo & Huebner, 2004) were eligible for inclusion. The remaining 13 publications either lacked congruent conceptual definitions of the parental autonomy support construct, or did not measure the parental autonomy support construct separately in the analysis. A total of 16 publications were incorporated into the review of parental autonomy support.

Publications meeting the inclusion criterion were organized into subgroups by study objectives and adolescent outcomes. Identified themes included (a) parental autonomy support and academic self-regulation, (b) parental autonomy support and non-academic self-regulation, and (c) parental autonomy support and adolescent well-being and adjustment. Sources were reviewed based on the following extracted data: author/year, theoretical framework, sample, purpose, design, and findings. Only data relevant to the purpose of this review were documented and are discussed.

**Parental Autonomy Support and Academic Self-Regulation**

Autonomy-supportive environments are believed to support full internalization and effective self-regulation (Deci & Ryan, 2000). Internalization is the process by which a set of norms or values is adopted as one’s own and becomes part of the individual’s worldview. Internalization of parental autonomy support is believed to play a role in autonomous forms of regulation. The influence of parental autonomy support on adolescent academic outcomes has been evaluated; researched aspects of this influence included the impact of parental autonomy support on academic motivation (Chirkov & Ryan, 2001; Niemiec, Lynch, Vansteenkiste, Bernstein, Deci, & Ryan, 2005; Vallerand,
Fortier, & Guay, 1997) persistence, (Ratelle, Larose, Guay, & Senecal, 2005), learning strategies (Vansteenkiste, Zhou, Lens, & Soenens, 2005), and scholastic competence and achievement (Soenens & Vansteenkiste, 2005). Research evaluating these academic outcomes supports the positive influence of PAS.

Six studies were found that examined parental autonomy support and its impact on academic motivation and self-regulation (Table A1). In a cross-cultural study including both American and Russian adolescents who were 16-19 years of age, Chirkov and Ryan, (2001) examined the relationship between perceived parental autonomy support and academic self-regulation and well-being. Parental autonomy support predicted greater adolescent well-being, was positively correlated with academic self-regulation, and was associated with more integrated and/or intrinsic motivation in school and with identification with school-related goals in both American and Russian students.

Vallerand et al. (1997) evaluated parental autonomy support, perceived school competence and school autonomy, with adolescents’ school motivation in a sample of French-Canadian 9th and 10th graders. Results revealed that, when parents were less autonomy supportive, students perceived themselves to be less competent and autonomous. When students felt less competent and autonomous, their academic motivation was diminished. Lower levels of academic motivation were associated with increased intentions to drop out of high school and were predictive of actual increased school dropout. A surprising finding of this study was that, in comparison with dropout students, persistent students reported increased introjected regulation. It was hypothesized that because introjection is a non-self-determined form of motivation, dropout students would exhibit higher levels of introjection than persistent students.
would report. Vallerand et al. suggested that parental pressures regarding academics may contribute to this identified introjection and that the students’ internalization of the importance of attending school influenced their decision to persist in the academic environment.

Niemiec et al. (2005) conducted two studies evaluating the relationship between perceived need support from parents, adolescent self-regulation for academics, and adolescent well-being in Belgian high school students. Study 1 results revealed that adolescent report of both maternal and paternal support of needs independently predicted adolescent well-being; however, perceived need support from mothers was greater than perceived need support from fathers was found to be. Study 2’s results showed that adolescent autonomous self-regulation to attend college partially mediated the relationship between perceived parental need support and adolescent well-being. Niemiec et al.’s two studies indicate that parental support remains important for adolescent self-regulation and well-being throughout adolescence.

In a sample of 729 French high school seniors, Ratelle et al. (2005) found that adolescents’ perceptions of parental autonomy support were positively correlated with adolescent fulfillment of the psychological needs for autonomy, competence, and relatedness. In addition, perceived parental autonomy support was predictive of persistence in a rigorous science curriculum; however, this relationship was partially mediated by the adolescent’s psychological needs fulfillment of autonomy and competence. Ratelle et al. concluded that overall, adolescents’ perceptions of parental autonomy support play a role in adolescent self-governance and achievement.
Vansteenkiste, Zhoe, et al. (2005) found that parental autonomy support was related to more adaptive learning strategies and well-being in a group of Chinese immigrants learning English and noted that increased autonomous motivation for studying predicted adaptive learning attitudes, academic success, and well-being. In addition, these investigators also reported that maternal and paternal autonomy support were significantly related to the adolescent’s scholastic competence but were unrelated to the adolescent’s social competence.

Soenens and Vansteenkiste (2005) examined the role of both maternal and paternal autonomy support in a group of predominately male Dutch-speaking students living in Belgium (ages 15-21) and found that both were directly associated with adolescent self-determination in all life domains (school, academic, and friendship). Adolescent self-determination was positively and explicitly linked with measures of adjustment in all three life domains. Self-determination was found to be an intervening variable between the adolescent’s perceived environment and perceived adjustment. In addition, maternal but not paternal autonomy support was related to scholastic competence. Maternal and paternal autonomy support was related to higher self-determination in the adolescent and the increased self-determination was related to academic achievement and to social competence.

**Parental Autonomy Support and Nonacademic Self-Regulation**

A relationship between parental autonomy support and nonacademic regulatory behaviors also appears to exist. Four studies were identified that assessed parental autonomy support and adolescent nonacademic self-regulation (Table A2). Perceived
parental autonomy support has been associated with autonomous regulation (Hagger et al., 2007; Purdie, et al., 2004) engagement in prosocial behavior (Gagne, 2003), and internalization of helping behaviors (Roth, 2008).

In a cross-sectional/cross-cultural study, Hagger et al. (2007) reported a significant correlation between perceived autonomy support from parents, friends, and teachers and autonomous forms of regulation. The investigators conducted a study of early and middle-adolescent students across three countries representing both individualistic and collectivist cultures. Adolescent perceived autonomy support influenced adolescent perceived locus of causality, which, in turn, predicted the adolescent’s autonomous self-regulation for exercise. The researchers also concluded that parental and friend autonomy support was more significant than teacher autonomy support; this finding that was consistent across all three samples. The increased significance of parental and peer autonomy support appeared to be related to the context in which support was provided, to the degree of importance that the youth attached to a particular source, and to the youth’s exposure to with each source. Increased time spent in leisure activities with parents and peers may have played a role in their enhanced importance.

In a sample of undergraduate college students, Gagne (2003) examined the influence of parental autonomy support and adolescent autonomy orientation on psychological needs satisfaction and on engagement in prosocial behaviors. Both parental autonomy support and the adolescent’s autonomous orientation predicted general needs satisfaction, and needs satisfaction positively influenced engagement in prosocial behavior. The results of the studies by Hagger et al. (2007) and Gagne (2003) suggest
that adolescents who experience autonomy and relatedness in their socialization demonstrate more freedom to follow their own interests and exhibit greater overall adjustment.

Purdie et al. (2004) used measures of self-efficacy to examine the relationship of parent and adolescent perceptions of parenting, as well as that of parenting qualities, with academic and nonacademic self-regulation in a sample of high school students ($M = 14.8$ years of age). Findings revealed that adolescents and parents differed significantly on their perceptions of parenting style; parents perceived themselves to be more involved, less strict, and more autonomy granting than their adolescents perceived them to be. In terms of adolescents’ perceptions, the authors found that, parental involvement, and not autonomy granting, was the parenting characteristic most strongly related both to self-efficacy and to academic and non-academic self-regulation. The findings imply that adolescents who exhibit academic self-regulation are also more likely to demonstrate self-regulatory behaviors in other aspects of their life.

In a sample of undergraduate college students, Roth (2008) examined the relationship of parental autonomy support and parental conditional regard with integration and identification of self- versus other-oriented prosocial tendencies. It was hypothesized that parents who directed their adolescent’s decision making through conditional regard would have adolescents who were more likely to demonstrate prosocial tendencies, such as helping behaviors, because they desired recognition and appreciation by others. In contrast, adolescents of autonomy-supportive parents were hypothesized to internalize the autonomy support and to participate in prosocial behaviors because they perceived a need by another individual and not because they
sought personal gain. The findings indicated that autonomy-supportive parenting styles predicted greater internalization and other-oriented helping behaviors. The relationship between autonomy support and other-oriented helping was partially mediated by the degree of identified and integrated internalization. Roth’s results suggest that relationships between parental practices and prosocial tendencies are mediated by the adolescents’ level of internalization of the helping behavior.

_Parental Autonomy Support and Adolescent Well-Being and Adjustment_

Six studies examining parental autonomy support and adolescent adjustment were located (Table A3). These explorations of the relationship between parental autonomy support and adolescent well-being and adjustment have yielded some informative findings. Increased levels of adolescent reported parental autonomy support have been linked to enhanced life satisfaction (Abad & Sheldon, 2008; Downie, et al, 2007; Suldo, & Huebner, 2004); improved emotional and academic functioning (Wang, Pomerantz, & Chen, 2007); increased self-esteem, self-actualization, and vitality (Robbins, 1994), as well as greater adolescent psychological functioning (Soenens, Vansteenkiste, Lens et al., 2007).

In a cross-sectional study, Suldo and Huebner (2004) examined the function of adolescent life satisfaction in the relationship between authoritative parenting dimensions and adolescent problem behavior across adolescence. They found that psychological autonomy granting, defined as supporting the adolescent’s individuality and emotional autonomy by decreasing psychological control, was significant in the prediction of adolescent life satisfaction in early, middle, and late adolescence and that this
significance remained constant through all age groups. In addition, life satisfaction was
found to partially mediate the relationship between authoritative parenting dimensions
and behavior problems in adolescence.

Abad and Sheldon (2008) addressed the role of parental autonomy support and its
relationship to adolescent well-being and to endorsement of their natal culture in second-
generation college-aged immigrants. The study separately examined maternal and
paternal autonomy support and found significant positive correlations between maternal
and paternal autonomy support; however, only paternal autonomy support was related to
ethnic society immersion, internalization of natal culture, greater life satisfaction and
happiness.

In two concurrent studies, each evaluating a different ethnic origin, Downie et al.
(2007) evaluated the relationship of parental autonomy support, maternal autonomy
support (MAS), and paternal autonomy support (PAS) with cultural internalization and
well-being. Study 1 involved 105 multicultural subjects ($M = 20.2$ years of age) living in
Canada. Study 2 consisted of 125 Chinese-Malaysian student sojourners ($M = 20.8$ years
of age) who lived outside their natal country, and who completed the questionnaires via
the internet. Neither MAS nor PAS was found to be superior in the prediction of
internalization and well-being; however, adolescents who perceived more parental
autonomy support were more likely to internalize their host and natal cultures and to
exhibit greater well-being. Findings were similar across both studies and suggest that
both parents are important in the internalization of values process and well-being of their
adolescents.
Wang et al. (2007) implemented a cross-sectional/cross-cultural longitudinal design to compare parental control and perceived parental psychological autonomy support of American and Chinese adolescents. Parents’ psychological autonomy support predicted adolescents’ enhanced goal investment, as well as improved emotional and academic functioning; these findings strengthened across time. Enhanced emotional well-being was predicted by perceived psychological autonomy support in both countries. Overall, U.S. teens appeared to exhibit greater psychological benefits from increased PAS than their Chinese counterparts did.

Robbins (1994) conducted a study examining the adjustment of first-year college students and their perceptions of parental psychological characteristics. Findings indicated that adolescents who perceive parents as autonomy supportive tended to have higher self-esteem, improved self-regulation, better mental health, superior autonomous motivational orientations, and decreased difficulty with separation and individuation. Adolescents with lower perceptions of parental autonomy support demonstrated higher levels of separation-individuation symptomology. Student perceptions of paternal autonomy support were positively related to fathers’ self-esteem, while perceptions of maternal autonomy support were positively related to the degree of maternal autonomous causality. In comparison with fathers, mothers were generally perceived as more autonomy supportive. Causality orientations, as defined by SDT, are conceptualized as enduring personality traits that distinguish the source of a person’s motives for an action, and thus the degree of self-determination of their behavior (Deci & Ryan, 1985). Robbins’s findings replicated findings of a previous study (Grolnick & Ryan, 1987) of school-aged children.
In three concurrent studies, Soenens et al. (2007a) examined the relationship of parental autonomy support, defined as parental encouragement of adolescents’ self-expression, thoughts, and decision making, to adolescents’ psychological functioning in a sample of college and high-school students. In addition, the mediating effects of adolescents’ self-determination on psychological outcomes (global self-worth, depressive feelings, and social well-being) were also assessed. Parental autonomy support predicted increased self-determination, which, in turn, was positively related to adolescent psychological functioning. The results were similar across both adolescents and young adults.

Summary

The results of a thorough examination of the literature regarding parental autonomy support suggest a strong link between the adolescent’s perception of parental autonomy support and many important adolescent outcomes. Findings from the review may also indicate that adolescent perception of parental autonomy support not only is important during the adolescent years but may play a role in motivation, decision making, and quality of life well beyond the adolescent years. Only five studies (Abad & Sheldon, 2008; Downie, et al, 2007; Niemiec et al., 2005; Robbins, 1994; Roth, 2008) separately examined MAS and PAS. Results of all five studies revealed that both MAS and PAS were significant; however, a few differences were noted. Three studies (Roth, 2008; Niemiec et al.; Robbins, 1994; Roth, 2008) of Western adolescents yielded findings that perceptions of MAS appeared to play a slightly larger role in the outcome, whereas, findings from two studies (Abad & Sheldon, 2008; Downie, et al, 2007) conducted in
adolescents from Eastern cultures showed that PAS was more significant to the outcome variables. It appears that the role of parental autonomy support is universal but that the importance of each parent may vary across cultures.

**Limitations and Gaps in the Literature**

Review of the 16 eligible studies revealed that all but 2 studies incorporated SDT as the conceptual framework and conceptualized parental autonomy support as parental behaviors that encourage adolescent self-regulation, provide the adolescent with rationales for decision making, and offer the adolescent choice during negotiations. The 2 remaining studies (Purdie, et al., 2004; Suldo, & Huebner, 2004) were based on Baumrind’s (1991) parenting framework, and investigated parental autonomy support as an aspect of the authoritative parenting style.

Overall, study designs reflected adequate sample size, satisfactory age distribution, and equal gender representation. Only one study (Abad & Sheldon, 2008) had less than 100 subjects \( n = 99 \) and 9 studies (Chirkov & Ryan, 2001; Hagger et. al 2007; Niemiec et al., 2005; Purdie et al., 2004; Ratelle et al., 2005; Soenens & Vansteenkiste, 2005; Suldo, & Huebner, 2004; Vallerand et al., 1997; Wang et al., (2007) examined 200 or more subjects. Six of the studies (Abad & Sheldon, 2008; Gagne, 2003; Robbins, 1994; Roth, 2008; Soenens et al., 2007; Suldo & Huebner, 2004) were conducted in the United States whereas 2 studies (Purdie et al.; Soenens & Vansteenkiste, 2005; ) were conducted abroad and two studies (Ratelle et al; Vallerand et al., 1997) were conducted in Canada. The remaining six studies (Chirkov & Ryan, 2001; Downie et al., 2007; Hagger et. al., 2007; Niemiec et al; Vansteenkiste et al., 2005b;
Wang, et al.) were conducted in two or more countries; therefore, these studies demonstrated greater generalizability. All stages of adolescence and young adulthood were represented, and thus allowed for assessment of changes across time. Consistent findings regarding parental autonomy support among various cultures suggest that parental autonomy support is not socially bound and may play a role in adolescent development across both social and class boundaries. A major sampling limitation was the lack of inclusion of family structure in the analysis. Five studies separately reported maternal and paternal autonomy support, but only one study (Purdie et al.) included separate parental data and provided basic demographic information regarding family structure.

The inconsistent conceptualization of the parental autonomy support construct was the prominent limitation to this review. For example, parenting behaviors that involved promotion of communication and provision of choice (Hagger et al, 2007), encouragement of independent decision-making (Abad & Sheldon, 2008; Vallerand et al., 1997), and restraint from the use of pressure (Suldo & Huebner, 2004) were variously labeled parental autonomy support (Hagger, et al.; Vallerand, et al.), autonomy supportive parenting (Abad & Sheldon, 2008), parental autonomy granting (Suldo & Huebner, 2004) and/or parental psychological autonomy support (Purdie et al., 2004). One study (Wang et al., 2007) failed to give an explicit conceptual definition of their parental autonomy support construct. Overall, however, the frequently used conceptualization was that of SDT, which was consistently defined across studies. This conceptualization has been linked to outcomes in numerous studies conducted with different populations.
Measurement issues associated with the operationalization of parental behavior influencing adolescent autonomy have also been noted. These issues include the validity and reliability of the measures used in these studies. Four studies (Roth, 2008; Vansteenkiste et al., 2005; Soenens, & Vansteenkiste, 2005; & Soenens et al, 2007) utilized scales developed for children (Grolnick et al., 1991) rather than the corollary scale (Robbins, 1994) developed to assess perceptions of parental autonomy support among older adolescents. The Perceived Interpersonal Style Subscale (as cited in Vallerand et al., 1997) assessed PAS reported a Cronbach’s alpha of .54, which indicated less than optimal internal reliability of the measure (Waltz, Strickland, & Lenz, 2005).

Vague and overlapping measurement of parental autonomy support was found in three studies. The Child Report of Parent Behavior Inventory (as cited in Purdie, Carroll & Roche, 2004) is an instrument designed to assess child and adolescent perceptions of discipline practices within the family and does not uniquely address autonomy-supportive parenting practices. Each of the studies of parenting style (Purdie et al.; Suldo, & Huebner, 2004) used a different instrument to evaluate both parenting style and the parental autonomy support construct. Inconsistent operationalization of a construct can increase risk of measurement error and decrease generalizability of findings (Waltz et al., 2005). Inconsistent use of instruments to measure parental autonomy support, coupled with the frequent merging of various instruments, may decrease what is truly known about parental autonomy support.

Comparison of parent and adolescent perceptions of parental autonomy support was noted in only one study. Purdie et al. (2004) assessed the effect of parenting styles on adolescent self-regulation as perceived by both the parents and the adolescent and
discovered that perceptions of parents and their adolescent offspring differed significantly. The relationships among subscales of the authoritative parenting construct (strictness, involvement, and autonomy granting) were stronger for adolescent perceptions than for parent perceptions, and offered support for greater validity of adolescent reports; therefore, Purdie et al. utilized adolescent perceptions for the analysis of outcomes.

Six measures were developed and/or modified to assess parental autonomy support with varying degrees of validity and/or reliability. Instruments designed to target younger-aged children and younger adolescents may not be suitable for evaluation of older adolescents and could also produce inaccurate conclusions regarding this population; therefore, studies reports of problematic instruments must be carefully analyzed, and their findings must be closely scrutinized. The Perception of Parents Scale (Grolnick et al., 1991; Robbins, 1994), the most frequently utilized instrument, yielded the most consistent findings and showed good reliability, with Cronbach’s alphas ranging from .82 to .86 (Chirkov & Ryan, 2001; Robbins, 1994; Soenens & Vansteenkiste, 2005; Soenens et al, 2007).

In conclusion, despite the inconsistent labeling of the parental autonomy support construct and the few measurement discrepancies, research results indicate that adolescent perceptions of autonomy support by their parents appear to play a major role in their choices, motivations, and persistence in the major life arenas. The importance of this parenting attribute crosses both cultural and social boundaries. The full extent of the role of parental autonomy support is not known; however, it is evident that parental
autonomy support should be considered when adolescent behaviors, motivations for those behaviors, and prediction of future behaviors, are being evaluated.

Self-Determination

The search for literature related to the self-determination construct began with computerized databases as previously described. Key search terms included self-determination, intrinsic motivation, and adolescents. The initial search yielded 20 publications; however, 5 studies were excluded because their study aims were incongruent with the purpose of this review or because self-determination was not discussed in the analysis (Assor, Roth, & Deci, 2004; Kasser, Ryan, Zax, & Sameroff, 1995; Tanenbaum, Porche, Snow, Tabors, & Ross, 2007; Wiest, Wong, Cervantes, Craik, & Kreil, 2001; Wong, Wiest, & Cusick, 2002; ) and 2 studies (Thorgersen-Ntoumanis & Ntoumanis, 2006; Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005) failed to meet age specifications. A total of 13 studies on self-determination were included in this review.

Most studies viewed self-determination as a mediating variable, but studies differed in design and/or conceptualization. Publications meeting the inclusion criterion were organized into subgroups based on a thematic schema of the self-determination construct and/or the role of self-determination in adolescent outcomes. Identified themes included (a) self-determination and its impact on autonomy fulfillment, and (b) self-determination and its influence on motivation. Sources were reviewed based on the following extracted data: author/year, purpose, sample, methods, design, and findings.
Self-Determination and Its Impact on Autonomy

The literature review revealed reports from seven studies of aspects of the relationship between self-determination and autonomy (Table A4). Parental autonomy support has been noted to contribute to adolescent self-determination (Deci & Ryan, 2002; Guay & Chanal, 2008), and self-determined behavior has been shown to achieve more adaptive outcomes than results from less self-determined behavior. An individual’s motivation toward a behavior is related to the degree to which the individual’s environment promotes psychological needs fulfillment (Deci & Ryan, 2000, 2002). In addition to the impact of the home environment, that of autonomy-supportive behavior outside the primary residence has also been studied; aspects investigated include the effect of these external environments on adolescent self-regulation and competence (Black & Deci, 2000), as well as the effect of external autonomy supportive behavior on motivation and behavioral intentions (Edmunds, Ntoumanis, & Duda, 2007).

In their study of undergraduate college students registering for an organic chemistry course, Black and Deci (2000) found that students who perceived their instructors as autonomy supportive had higher levels of self-regulation and competence, as well as more course enjoyment and less anxiety related to class performance, than students who did not perceive their instructors as autonomy supportive. Students who enrolled in the course for autonomous reasons reported higher levels of perceived competence and lower levels of anxiety and demonstrated higher grades.

Edmunds et al. (2007) evaluated the effect of an autonomy-supportive teaching style on psychological-needs satisfaction, as well as on exercise intention, affect, and behavior in an exercise class composed of undergraduate college students. The
investigators reported greater perceived autonomy support, relatedness, competence, and affect in the experimental group. Attendance rates were also significantly higher in the experimental group. Overall, results from the Black and Deci (2000) and Edmunds et al. (2007) studies suggest that autonomy-supportive environments play a role in psychological-needs satisfaction in self-regulation in adolescence and young adults.

The manner in which information is provided or in which instructions are given to adolescents has also been shown to impact their autonomous motivation for adhering to and/or participating in various behaviors. An autonomy-supportive style of information dissemination has been examined; aspects studied include the impact of autonomy-supportive styles on motivation, performance, and persistence (Vansteenkiste et al., 2004; Williams et al., 1999), on effort expended in completing a task (Reeve, Jang, Hardre, & Omura, 2008), and on continuation of a behavior during free time (Hagger, Chatzisarantis, Culverhouse, & Biddle, 2003).

In three consecutive studies evaluating undergraduate Belgian college students in two separate learning domains, Vansteenkiste et al. (2004) examined the impact of providing a rationale in an autonomous versus controlled manner in the classroom and found that providing a rationale for material to be learned and providing instructions in an autonomy-supportive manner significantly enhanced autonomous motivation for learning, improved test performance, and increased persistence. The first two studies were conducted with college-aged participants, and findings indicated that persons who had increased autonomous motivation for learning also demonstrated deeper processing of the information and less levels of superficial learning. In the third study, conducted with 10th
and 11th grade Belgian students in a physical education class, the findings were replicated.

Williams et al. (1999) conducted a quasi-experimental longitudinal study with 9th–12th graders from two suburban high schools to evaluate the effectiveness of providing smoking education in an autonomy-supportive manner. The investigators found that adolescents’ perceived autonomy support was significantly related to their autonomous reasons not to smoke and also significantly predicted a decrease in smoking behavior 4 months after the intervention. Reeve et al. (2002) evaluated task identification and effort on a monotonous task in undergraduate college students in a Midwestern university. The researchers found that in comparison with who did not receive a rationale for the importance of participating in the task, those persons who did receive such a rationale perceived greater task importance, demonstrated increased perceived self-determination, and exhibited greater effort. These results suggest that the method and manner of instruction of a task or behavior may impact the individual’s intrinsic motivation toward the activity, even if the task or behavior may not appear stimulating.

In a study of 13 to 16-year-old adolescents, Hagger et al. (2003) investigated the impact of providing physical education in an autonomy-supportive manner on leisure-time exercise. Findings suggested that perceived autonomy support in physical education predicted the internal perceived locus of causality in a physical education context. Intrinsic motivation in physical education predicted identified regulation in a leisure-time physical activity context. These conclusions indicated that perceived autonomy support in one environment may be related to behavior in a different environment; in addition, they
and provided evidence that autonomy support by persons in authority positions results in more positive and productive outcomes.

Shahar, Henrich, Blatt, Ryan & Little (2003) examined the mediating impact of an individual’s general motivation orientation on the relationship between interpersonal relatedness and self-definition in a sample of 7th-9th graders. Their findings suggested that individuals who display increased levels of self-criticism also experience less autonomous motivation and that individuals with higher levels of interpersonal relatedness and greater self-definition were more autonomously motivated. Autonomous motivation predicted more positive life events and completely mediated the direct relationships found between self-criticism and efficacy with positive life events. Their conclusions indicated that adolescents’ general motivation orientation and view of self are influential in their overall adjustment and development.

Self-Determined Motivation

Research findings support that self-determined behavior assists in psychological needs fulfillment and that an individual’s perceptions of self-determination can be internalized and thus impact behavior (Hagger, Chatzisarantis, & Harris, 2006a). The role of self-determination is of vital importance in the older adolescent. The development of autonomy and the transition to independence brings about unique challenges specific for adolescents. Understanding how less intrinsically motivated behaviors can come to be valued by an individual has become a focus of behavioral researchers.

Intrinsic or autonomous motivation is the highest form of self-determined behavior and has been linked to some significant adolescent outcomes, including
happiness, self-realization, and attitude (Hagger et al., 2006a; Miquelon, & Vallerand, 2008), as well as endurance and engagement in physical activities (Chatzisarantis, Hagger, Biddle, & Karageorghis, 2002; Cresswell & Eklund, 2005). Antecedents negating self-determination have also been evaluated in the adolescent population (Houlfort, Koestner, Joussemet, Nantel-Vivier, & Lekes, 2002) (Table A5).

Happiness, self-realization, and attitude. Miquelon and Vallerand (2008) examined motives associated with the goals that an individual pursues as well as the relationship between motives and an individual’s well-being. An additional aim of the study was to assess the relationship of well-being to self-reported physical health. Findings suggested that persons who pursued autonomously motivated goals experienced significantly enhanced well-being. Increased well-being was predictive of more adaptive coping and fewer reports of physical ailments.

In their study, Hagger, et al. (2006a) sought to extend what is knowledge about the role of psychological-needs satisfaction and behavior by examining the relationship between global psychological-needs satisfaction and autonomous motivation in two behavioral contexts. The study was based on the integration of the theory of planned behavior and SDT. The researchers hypothesized that global psychological needs would influence autonomous motivation at both the contextual and situational levels. In the study of undergraduate and graduate students subjects were divided into two groups: leisure-time exercise or dieting target behavior. General instructions were provided on the basis of group assignment. After one week, data were gathered regarding psychological-needs satisfaction and perceived locus of causality. Two weeks later, participants’ behavior engagement in leisure-time physical activity or dieting behaviors was assessed.
The investigators found that psychological-needs satisfaction and autonomous motivation had a significant impact on the individual’s attitude. Autonomous motives partially mediated the effects of psychological-needs satisfaction on attitude and on perceived behavioral control. Autonomous motivation and attitude were significantly related to behavioral intention; behavioral intention was predictive of behavior, including leisure-time behavior. The authors suggested that their findings indicate that an individual’s general autonomous motivation and psychological-need’s satisfaction may be significant in predicting behavior at a situational level. These findings imply that an assessment of individuals’ overall psychological-needs satisfaction may be beneficial in understanding and predicting their future behavior, including at the situational level, as well as be informative in the design of an intervention.

*Endurance and engagement in physical activities.* Chatzisarantis et al. (2002) investigated the relationship between perceived locus of causality (self-determination) and attitude toward physical activity in a group of young adolescents. Ajzen’s (1991) theory of planned behavior (as cited in Chatzisarantis et al., 2002) and SDT frameworks were integrated in the prospective study design. The authors concluded that persons participating in physical activity for intrinsically motivated reasons exerted greater effort and exhibited greater participation than those did who had less autonomous motivation for physical activity.

In a study of young professional athletes, similar findings were reported (Cresswell & Eklund, 2005). This study investigated the relationship between changes in athlete burnout and source or type of motivation. Athletes who exhibited self-determined
forms of motivation experienced less sport devaluation, decreased exhaustion, and less
burnout.

Antecedents that negate self-determination. Houfert et al. (2002) studied type of
motivation as an outcome variable when they examined the impact of performance-
contingent rewards on perceived autonomy, competence, and intrinsic motivation in a
group of undergraduate college students. The researchers suggested that the use of
performance incentives may generate feelings of pressure to participate in an activity and
may create feelings of anxiety about performance. Furthermore, the use of incentives did
not increase interest or improve free-choice behavior.

Limitations and Gaps in the Literature

The stated purpose of the bulk of the reviewed studies was to examine factors
impacting an adolescent’s life choices. Only three studies (Chatzisarantis et al, 2002;
Cresswell & Eklund, R., 2005; Hagger et al., 2003) were located that examined
relationships addressing the quality and quantity of the adolescent’s health choices. No
studies of adolescent self-determination included variables related to parental
relationships or familial factors. Because parents remain the primary socializing agents
for their adolescent offspring into young adulthood (Hansell & Mechanic, 1990), this lack
is a noted weakness of the studies in this area.

Review of the 13 eligible studies revealed consistent utilization of SDT as a
conceptual framework; however, 3 groups of investigators (Chatzisarantis et al., 2002;
Hagger et al., 2003; Hagger et al., 2006a) integrated the theory of planned behavior and
self-determination in their conceptual design. The consistent use of SDT as the
conceptual framework allowed for consistent definition of terms and use of terminology, enhanced credibility of findings, eased identification of knowledge gaps, and increased theoretical knowledge.

In general, review of the literature revealed adequate sample size and gender representation. Researchers in two studies (Edmunds et al., 2007; Houlfort et al., 2002) enrolled less than 100 participants. Equal gender representation was generally a strength; however, two studies (Cresswell & Eklund, 2005; Reeve et al., 2002) had a significant gender bias in their design. Cresswell & Eklund (2005) utilized an all-male sample while Reeve et al.’s sample was 65% female. Vansteenkiste, Simons et al. (2004) also assessed an all-female sample in study 1 and study 2, but had equal gender representation in the third follow-up study. Two studies (Cresswell & Eklund, 2005; Vansteenkiste et al., 2004) were conducted outside of the United States and reported findings similar to those of conducted in the United States. Race and SES of the participants were generally comparable to the general population of the countries in which the studies took place.

Conceptual and theoretical congruence was noted between the instruments utilized to obtain data and the theoretical framework identified to guide the study. Researchers in two studies (Chatzisarantis et al., 2002; Hagger et al., 2003) obtained their sample across three states, and, as a result, increased the generalizability of their findings. Because four studies involving different samples replicated findings, the validity and generalizability of those findings were further increased (Black & Deci, 2000; Houlfort et al., 2002; Vansteenkiste et al., 2004; Williams et al., 1999).

Reports from four studies (Chatzisarantis et al., 2002; Hagger et al., 2006; Miquelon, & Vallerand, 2008; Shahar et al., 2003) did not include the Cronbach’s alpha
of the instruments used; however, each group of authors utilized established instruments that had previously yielded Cronbach alphas greater than 0.80. In addition, for all measures of interest to this review, the remaining studies yielded Cronbach’s alphas greater than or equal to 0.70.

Summary

In conclusion, the importance of adolescent self-determined behavior appears evident in social, academic, and health environments. The source of the adolescents’ motivation and the level of motivation that adolescents possess regarding a specific behavior appear to be significantly related to their commitment and their continuation of that behavior over time. Identifying key antecedents impacting adolescent motivation may provide crucial knowledge regarding establishment of productive relationships, participation in productive and fulfilling activities, and initiation of healthy behaviors.

Adolescent Motivation for Health Behaviors

Antecedents impacting motivation and behaviors influenced by motivation in the adolescent population were discussed in the Self-Determination section; however, studies specifically addressing motivation for health behaviors were reserved for this discussion. Although there exists some theoretical overlap between the self-determination literature and the health motivation literature, the limited amount of knowledge regarding adolescent motivation for their health behaviors warranted highlighting this area in this separate review.
A significant body of literature exists that examines motivation as a dependent variable or as an antecedent of a particular outcome, but few studies have directed attention to factors influencing motivation in the adolescent population. The search for literature related to the adolescent motivation for health behaviors began with computerized databases as earlier in this dissertation. Key search terms included health behaviors, motivation and/or attitudes, and adolescents. Of the 12 publications found during the initial search, one study (O’Conner, Friel, & Kellshcer, 1997) was excluded because of inapplicable age specifications, 3 studies (Turner & Mermelstein, 2004; Woodruff, Lee, & Conway, 2006; Wu, Stanton, Xiaoming, Gallbraith, & Cole, 2005) were omitted because, although level of motivation played a role in group assignment, the studies did not involve evaluating factors influencing adolescent motivation or assess the impact of motivation on their behavior. Two studies, those of Laye-Gindhu & Reichl (2005) and of Martin and Leary (2001), were excluded because both studies examined motivation for risky adolescent behaviors; this study aim is not congruent with the specific aims and objectives of the present study. Last, one study (Hagger, Chatizisarantis, Biddle, Orbell, 2001) was excluded because it examined adolescent attitudes and past behavior toward physical activity but did not evaluate antecedents impacting adolescents’ attitudes toward physical activity. A total of 5 studies (Table A6) met inclusion criteria and were congruent with the objectives of this integrative review regarding motivation for adolescent health behavior.

Each of the five studies (Douthitt, 1994; Grunfeld, 2004; Keats, Culos-Reed, Courneya, & McBride, 2007; Lemieux, Fisher, & Pratto, 2008; Van Excel, de Graaf, & Brouwer, 2006) evaluated adolescent motivation for participating in healthy and/or
proactive health behaviors. Douthitt examined a sample of 9th, 10th, and 11th graders at a Midwestern high school and evaluated the students’ primary motivations for participation in physical activity in structured and nonstructured environments. Significant gender differences in motivation were noted in both group environments. For males in the structured environment, the primary motive for exercise adherence was to become more romantically appealing to females. An inverse relationship was noted; the less romantically appealing the adolescent males perceived themselves to be, the greater their motivation for exercise. No significant relationships were found in the male unstructured group. Female motivation for exercise adherence in the structured setting was significantly inversely related to perceived athletic competency. When females perceived themselves to be less athletically competent, their motivation for exercise adherence was greater. In the unstructured female group, an inverse relationship was noted between physical appearance and exercise; however, when global self-worth was entered into the regression equation, a positive relationship was found between physical appearance and exercise adherence. The more confident the females in the unstructured group were in their physical appearance, the more likely they were to exercise.

Keats et al. (2007) applied the theory of planned behavior (TPB) to a group of adolescent cancer survivors 15-20 years of age to investigate motivation to engage in and continue physical activity. The following motivations for physical activity were described in this special population: (a) to keep physically fit and stay healthy, (b) to stay busy and connected with friends, (c) to achieve normalcy, (d) to manage weight (e) to increase energy, (f) to increase self-confidence, (g) to reduce stress, and (h) to speed recovery from cancer treatments.
Grunfeld (2004) investigated motivations for intentions to practice safe sun exposure in a group of female university students aged 18-22. Previous performance of safe sun exposure practices perceived vulnerability to developing skin cancer were the most predictive of intentions to practice safe sun exposure. Neither severity of the consequences of sun exposure to skin nor rewards such as increased appeal with a tan were significant predictors.

Lemieux et al. (2008) evaluated motivation for HIV prevention and its influence on HIV prevention behaviors and attitudes in a group of urban high school adolescents. A music-based HIV prevention intervention was designed to increase HIV prevention motivation, behavioral skills, and behaviors. The study design incorporated the delivery of HIV prevention information to the treatment group through song lyrics and music. The control group received the same information, but the method of dissemination was reflective of a structured classroom setting. Participants in the treatment group maintained a constant level of motivation for HIV prevention behaviors, whereas those in the control group demonstrated a decline in motivation. In addition, increased motivation for HIV prevention was predictive of condom use and was significantly related to increased perception of vulnerability to HIV infection. These findings suggest that the method of information dissemination may impact the motivation and engagement of adolescents, which, in turn, may affect certain health-related behaviors.

Van Excel et al. (2006) conducted a discourse analysis in a group of Dutch youths 12-15 years of age and examined youths’ attitudes about their lifestyle, with an emphasis on weight control. After assessment data were collected, the researchers utilized the Q methodology to identify five motivational categories reflective of adolescents’ attitudes.
and level of motivation regarding health promoting behaviors: (a) carefree sporty, (b) worrying dependent, (c) contented independent, (d) looks over content, and (e) indifferent solitary. Carefree-sporty adolescents, two thirds of whom were male, did not often think about their health often but lived overall healthy lifestyles. These adolescents were generally of normal weight, ate a more well balanced diet, often participated in sports, and generally perceived themselves to be healthy. Adolescents in the worrying-dependent discourse group thought a great deal about their health and were very conscious about food. They participated in fewer sports than those in the carefree-sporty group did and were the least satisfied with their body of all the discourse groups. Adolescents in the content-independent group were generally not concerned with their future health. They were not concerned with body image and felt that others should be judged on the basis of their inner beauty. Participants in the looks-over-content group were very conscientious about their diet. Adolescents in this group focused more on their outward appearance than on the health of their bodies and were more likely to be consumed with their looks than any other group was found to be. Adolescents from the indifferent-solitary group appeared discontented with themselves, had less social time, and thought little about their health or their outward appearance. Similarities found across groups included importance placed on independence, emphasis on peer relationships and acceptance, and a general lack of concern for the future in relation to health promotion/behaviors.

As the limited number of studies available for review indicates, motivation for adolescent health behaviors is recognized as an understudied construct. Of the studies eligible for inclusion, only two (Grunfeld, 2004; Keats et al., 2007) targeted the older adolescent and assessed motivation for a health-promoting behavior. The remaining
studies evaluated both young (Van Exel et al., 2006) and middle (Douthitt, 1994; Lemieux, et al., 2008; Fisher, & Pratto, 2008) adolescents. These five studies of different adolescent age groups provided a vague picture of motivational changes across time and offered some evidence of a shift from a more peer-driven and controlled motivation in early and middle adolescents to a centered-on-perceived-risks motivation in older adolescents.

Limitations of Methods and Gaps in Literature

In general, race and SES of participants across the five studies were comparable to those of the general population. Sample sizes appeared acceptable on the basis of Cohen’s (1988) criterion. All five studies included more than 90 subjects and two (Grunfeld, 2004; Lemieux et al., 2008) enrolled more than 200 participants. Two studies (Grunfeld; Douthitt, 1994) had disproportionate representation of gender in their adolescent samples. Grunfeld’s sample was 86% female, and Douthitt (1994) utilized a 66% male sample. Age distribution appeared equally dispersed; however, the encompassment of multiple stages of adolescent development reflected in this review may decrease what is known about a specific developmental stage. Van Exel et al. (2006) utilized a young-to-middle-adolescent sample, three studies (Douthitt, 1994; Keats et al., 2007; Lemieux) examined middle to older adolescents, and one study (Grunfeld) investigated older adolescents and young adults.

No consistent conceptualization of health, health behaviors, or motivation for health behaviors was noted among studies. In addition, no specific conceptual framework has been repeatedly tested in this area. Only three studies (Grunfeld, 2004; Keats et al.,
identified a framework and no one framework was utilized in more than one study. The association of perceived need with health-promoting behavior was the only replicated finding (Grunfeld; Lemieux et al). Two studies (Keats et al.; Van Exel et al., 2006) assessed factors impacting motivation as a precursor to their primary aim.

Methodological concerns were also noted during the review. Three studies (Douthitt, 1994; Grunfeld, 2004; Lemieux et al., 2008) were quantitative in nature. Although Lemieux, et al. employed methods and instruments that were age specific, these authors did not discuss regarding the reliability or validity of their instrumentation. The remaining two studies (Douthitt; Grunfeld) reported a Cronbach’s alpha of \( \geq 0.80 \), and Douthitt also provided evidence of prior use of instruments for the target population.

Two studies (Keats et al., 2007; Van Exel et al., 2006) incorporated a qualitative approach in the analysis of their data. Van Exel et al. implemented a discourse analysis in an effort to identify thematic categories based on individual responses. Keats et al. only provided tallied data for theme identification. In addition, the study design was retrospective, and the time varied between the participant’s cancer treatment/remission and study enrollment/data collection.

Gender differences were specifically highlighted in two studies. Douthitt (1994) found that the origin of motivation may differ between males and females in middle adolescence, whereas Van Exel et al. (2006) reported that females were more likely to be focused on their diet and to be more worried about their weight than their male counterparts were found to be.
No studies were identified that evaluated the impact of the family on adolescent motivation for health behaviors. Researchers in two studies (Douthitt, 1994; Van Exel et al., 2006) identified and evaluated the importance of peer relationships but did not extend this evaluation to familial relationships. In addition, family variables, (e.g., family structure, living arrangements) were not included in the demographic analysis and were not controlled for in the statistical analyses.

In summary, a pattern of increased motivation leading to increased engagement in health behaviors emerged among studies addressing health-promoting behavior; this pattern provides support for the current study. Further support for this study is supplied by the significance of investigation of the influence of parental/familial relationships on health behaviors in the older adolescent population.
CHAPTER 3

METHODS

The purpose of this research was to examine the relationship between parental autonomy support and motivation for dietary physical activity practices in 18-to-20 year old freshman and sophomore college students. In addition, the evaluation of self-determination as a mediating variable was also assessed. This study incorporated a correlational design and utilized self-report by the participant as the method of data collection to assess the study objectives.

Sample

A non probability convenient quota sample was assessed. Participants were older adolescents who were currently attending an urban 4-year college in the Southeast. Because it was desirable to enhance the generalizability of the study, students enrolled in core required English courses were invited to participate. Such courses included Basic Skills English, English Composition, Oral Communication, and American Literature. The average English class size was 25 students, and the target sample size was 125.

Study participation information, including eligibility requirements, was provided to each potential participant in written form. In addition to the requirement that the participant be 18-20 years old, eligibility criteria specifications were that the adolescent (a) had never been married; (b) did not have children of their own; (c) had not been diagnosed with a health condition that restricted physical activity or mandated a
particular diet; (d) were enrolled in their 1st or 2nd year of college, (e) had two parental figures; and (f) were able to read, write, and speak English. Those meeting eligibility requirements were then invited to participate. Participants were informed that participation was voluntary and confidential and that they could withdraw from the study without penalty at any time. Those choosing not to participate or who did not meet eligibility criteria were dismissed from class or allowed to begin that day’s assignment. Students choosing to participate were then provided a packet that contained basic study information and questionnaires. After the questionnaires were completed on site, participants were given a $5.00 campus lunch card in exchange for their time.

Previous studies (Chirkov & Ryan, 2001; Gagne, 2003) examining the influence of parental autonomy support on child and adolescent outcomes have yielded a small to medium effect size ranging from .38 to .54. Because the primary analysis in this study used a regression analysis, the $r$ of .38 was transformed into an effect size for regression ($Y^2 = .14$). With three predictors, a Cronbach’s alpha of .05, and a power of .80, a sample size of 70 was needed for this study.

Protection of Human Participants

The study participants were anonymous. Each packet/questionnaire displayed an identification number in the top right corner that was assigned for organization and statistical analyses only.

After Institutional Review Board for Human Use approval was obtained (Appendix B), potential subjects were provided study details in written form; details
included voluntary participation, risks, benefits, and their right to withdraw from the study without penalty. Study participation implied consent.

Measures

Covariates and Potential Covariates

Background Questionnaire (Appendix D): Demographic variables included the adolescent’s gender and age; current residence; family structure; ethnicity; socioeconomic status of the family of origin, which was established by applying the Hollingshead (1965) Index. Gender, ethnicity, residence and family structure were entered as nominal data, and SES was entered as interval data. After the questionnaire about demographic data was completed, participants completed the four self-report instruments described next.

Predictor Variables

Parental Autonomy Support: Parental autonomy support was measured by utilizing a subscale of the College-Student Scale of the POPS (Robbins, 1994). The POPS measures perceived parental autonomy support and parental involvement, in addition to evaluating the feelings of warmth of each parent. The college-age version of this scale is a modification of the original tool developed to examine these same parental qualities in parents of elementary-age children (Grolnick et al., 1991). The complete measure is composed of 42 items, 21 for mothers and 21 for fathers. From these items, 6 subscale scores are possible: Maternal Autonomy Support (MAS), Maternal Involvement, and Maternal Warmth, as well as Paternal Autonomy Support (PAS), Paternal
Involvement, and Paternal Warmth. Only the maternal autonomy support subscale (MASS) and paternal autonomy support subscale (PASS) were utilized in this study. The MASS and PASS scales each consist of 9 items. Participants rate their agreement with statements (e.g., “My mother/father seems to know how I feel about things”) on a 7-point likert-type scale ranging from 1 (not at all true) to 7 (very true). The scores from each item were totaled. Participants’ scores were then divided by the number of items on the instrument (9) to obtain each participant’s average score. Possible scores range from 1 to 7. Higher scores are reflective of increased adolescent perceived parental autonomy support. The college-age version of the POPS has consistently yielded Cronbach’s alphas ranging from .82 to .86 (Chirkov & Ryan, 2001; Soenens & Vansteenkiste, 2005; Soenens et. al, 2006) and the MASS and PASS have yielded Cronbach’s alpha ranging from .81 to .83 (Robbins). Confirmatory factor analysis supported the scale’s construct validity (Robbins). Estimated time required to complete each of these measures was 3-5 min.

Self-Determination. The SDS (Sheldon & Deci, 1996) is a self-report instrument designed to measure the extent to which people function in a self-determined manner. The scale was developed within the SFT framework, in which it is postulated that the degree of self-determination is a stable characteristic of people’s overall personalities. The tool reflects of an individuals’ awareness of their self-image and their perception of choice in regard to decisions related to their lives. The SDS is a 10-item scale, with two 5-item subscales. The first subscale is designed to measure consciousness of oneself and the second subscale reflects the degree of perceived choice in making personal decisions. For each item, participants choose which statement was most true for them (e.g., A. “I
sometimes feel that it’s not really me choosing the things I do” or B. “I always feel I choose the things I do”) by using a numerical scale ranging from 1 (only A feels true) to 5 (only B feels true). The overall SDS score is computed by averaging the responses on the 10 items (Sheldon & Deci, 1996). Possible scores range from 1 to 5; higher scores reflect a more self-determined individual whereas lower scores indicate persons who participate in activities for less self-determined motives. The tool was originally developed by SDT experts (Sheldon & Deci, 1996). The scale has demonstrated good internal consistency (Cronbach’s $\alpha = .85 - .93$; Sheldon et al., 1996; Thrash & Elliot, 2002) and adequate test-retest reliability ($r = .77$ over an 8-week period; Sheldon & Deci). Construct validity has been confirmed by hypothesis testing. In a longitudinal study of a sample of undergraduate college students, Sheldon and colleagues utilized the SDS to examine the construct of autonomy and the relative stability of person-level and daily-level autonomy and competence. The researchers’ findings suggested that that autonomy and competence were fairly stable traits and that persons with higher trait competence and autonomy tended to experience more good days than those with lower levels of competence and autonomy were found to experience. In addition, the authors concluded that the fulfillment of the psychological needs of competence and autonomy were associated with greater well-being. The time required to complete the measure was less than 5 min.

**Dependent Variables**

*Motivation for the health behaviors of diet and exercise.* The variables of motivation for diet and motivation for exercise were evaluated utilizing behavior specific versions of the Autonomous Regulatory Style Scale (ARSS). The ARSS is a 6 item
subscale derived from the Treatment Self-Regulation Questionnaire (TSRQ) (Ryan & Connell, 1989), and was designed to evaluate autonomous motives of why people engage in some health behavior, try to change an unhealthy behavior, adhere to a treatment program, initiate treatment for a medical condition, or engage in some other health-related behavior. Four versions of the scale exist: smoking cessation, diet improvement, exercising regularly, and drinking responsibly. Autonomous motivation for diet and exercise behaviors were selected for examination because recent research suggests that individuals who pursue goals for autonomous motivations are more likely to exhibit greater effort, perceive less conflict, and demonstrate greater enthusiasm to modify their behavior (Koestner, 2008). The ASRR was developed within SDT by persons well versed in the theoretical framework and has been tested and validated on adolescents (Levesque, Williams, Elliott, Pickering, Bodenhamer et al., 2007; Williams, et al, 1999). Cronbach’s alpha for internal consistency reliability for the ARSS has consistently ranged from .72 - .85 (Williams, Levesque). Construct validity was verified by confirmatory factor analysis and by the pattern of correlations between the scale’s factor scores and observations made by clinical experts ($r = .95, p < .05$; Ryan et al., 1995). Hypotheses testing confirmed that individuals who perceive themselves as internally motivated to participate in an activity are less likely to feel pressured and more likely to express a willingness to engage actively. This finding provided some support for predictive validity. An average score for the ARSS (diet) and the ARSS (exercise) was obtained by summing the 6 item responses and then dividing each participant’s total by the number of items on each instrument (6).
Procedure

Data were collected in the English department of an urban 4-year college in the Southeast. Core English classes were targeted. Study information and eligibility requirements were posted throughout the English department one week prior to data collection. Data collection occurred at the beginning of each class. Potential participants were provided a written information sheet that detailed essential study elements, and was all questions that arose were answered by the researcher. All self-identifying eligible persons who desired to participate were provided a numbered packet that contained (in order) the demographic questionnaire and all other questionnaires (MASS, PASS, SDS, ARSS (diet) and ARSS (exercise). After completing all of the instruments contained in the packet, each participant was issued the $5.00 lunch voucher.

Data Analysis Plan

The SPSS version 15.0 was used for analyzing data in this study. After data were entered into the data file, data cleaning was performed to identify errors and/or missing data. Individual item mean scores were substituted if only one item on the tool was not completed. List-wise deletion was utilized for participants who did not complete all of the information in the packets. A codebook was maintained throughout the study and included all variables, each variable’s level of measurement, and each variable’s position in the dataset. The codebook also contained the precise coding information of how each variable was scored.
Description of Sample

Demographic variables of age, gender, residence, family structure, and ethnicity were summarized by using frequencies and measures of dispersion to describe sample characteristics. Sample characteristics of independent, mediating, and dependent variables were depicted. Respondents’ family SES was reported as interval data. Also reported as interval data were the independent (MAS and PAS) and the dependent variables (motivation for healthy dietary behavior and motivation for exercise behavior). Before further analyses were undertaken, bivariate correlations between all variables were conducted. MAS and PAS were assessed for a relationship. In addition, the internal consistency of each instrument was assessed by determination of Cronbach’s alpha before data analysis was begun.

Quantifying Extraneous Variables

Adolescent gender was coded as a categorical variable (male = 0, female = 1); ethnicity (1 = minority, 2 = non-minority), college rank (1 = freshman, 2 = sophomore), family structure (1 = 2 biological parents, 2 = all other family structures), and residence (1 = lives with parents, 2 = does not live with parents) were coded in a similar fashion. SES was obtained via the Hollingshead Index (1965).

Analysis of data

Hypothesis 1: Older adolescents’ perceived parental autonomy support is positively related to these adolescents’ motivation for healthy dietary behaviors.

Bivariate correlations were conducted to assess for significant relationships between
study variables. The independent variable, parental autonomy support, was analyzed for a relationship with the dependent variable, motivation for healthy dietary behavior. Hierarchical multiple regression was then implemented. First, significant demographic variables were entered into the model. Then, MAS and PAS were incorporated into the model. Motivation for dietary behaviors was regressed on parental autonomy support while controlling for all significant relationships identified in the bivariate analyses.

_Hypothesis 2: Parental autonomy support positively affects adolescent self-determination which then positively affects adolescent motivation for dietary behaviors._

Two hierarchical regression analyses were conducted to assess hypothesis 2. Because it was desirable to reduce degrees of freedom utilized and to strengthen the power in the analysis, only demographic predictor variables significantly correlated \( p < .05 \) with the dependent variable in the bivariate correlation matrix were entered into the hierarchical regression. The first analysis assessed the relationship between parental autonomy and adolescent self-determination. No demographic variables were significantly correlated with self-determination; therefore the predictor variables (MAS and PAS) were regressed on the dependent variable, self-determination. The second phase of the analysis examined the relationship between the independent variables (MAS and PAS) and the dependent variable, adolescent motivation for diet and also assessed self-determination as a mediating variable. First, the demographic variables significantly correlated with adolescent motivation for healthy dietary behaviors were entered. Second, the predictor variables (MAS and PAS) were entered into the next block of the model. Lastly, the mediating variable (self-determination) was entered into the next block of the model.
Hypothesis 3: Older adolescents’ perceived parental autonomy support is positively related to adolescents’ motivation for exercise behaviors. As cited for hypothesis 1, hierarchical regression was applied. Motivation for exercise behavior was used as the dependent variable.

Hypothesis 4: Parental autonomy support positively affects adolescent self-determination which then positively affects adolescent motivation for exercise behaviors. The procedures cited for hypothesis 2 were applied. Motivation for exercise behavior was the dependent variable.
CHAPTER 4
FINDINGS

This chapter includes a report of the findings from the statistical analyses utilized to examine study variables and answer the hypotheses of this study. Descriptive analysis of the characteristics of the sample, bivariate correlation of variables, assessment of the association of MAS and PAS, assessment of the reliability of the measures, and hypotheses testing were completed.

Description of the Sample

The sample consisted of 132 freshman and sophomore college students recruited from an urban 4-year university in the Southeast. A total of 227 students enrolled in core English courses were approached; 68% of those approached were eligible and participated. A total of 150 participants met study inclusion criteria, enrolled and completed the questionnaires. Eighteen questionnaire packets were incomplete and were, therefore, excluded from the analyses.

The description of the demographic characteristics of the sample included the following: age, gender, ethnicity, family structure, socioeconomic status, college rank, and residence. The sample ranged in age from 18 to 20 years \((M = 18.52\) years). Sixty-five percent of the participants were female \((n = 86)\), and fifty-eight percent \((n = 77)\) were Caucasian. All participants reported two parental figures; however, family composition varied. Family structure composed of two biological parents was the most frequently
reported \((n = 91)\). Participants were primarily middle socioeconomic class, freshmen \((n = 100)\), who lived outside of the parental residence \((n = 100)\). Table 1 provides descriptive statistics on all of the demographic variables.

### Table 1

*Characteristics of the Sample \((N = 132)\)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency/Percent</th>
<th>Mean/SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td>18.52 (.703)</td>
<td>18 - 20</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
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</tr>
<tr>
<td>Male</td>
<td>47 (35.3%)</td>
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</tr>
<tr>
<td>Female</td>
<td>85 (64.7%)</td>
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<tr>
<td>Ethnicity</td>
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</tr>
<tr>
<td>Caucasian</td>
<td>76 (57.9%)</td>
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</tr>
<tr>
<td>African-American</td>
<td>56 (42.1%)</td>
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<td></td>
</tr>
<tr>
<td>Family Structure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Parent biological</td>
<td>90 (68.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Biological and 1 Step- parent</td>
<td>27 (20.3%)</td>
<td></td>
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</tr>
<tr>
<td>1 Parent household</td>
<td>9 (6.8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adoptive</td>
<td>3 (2.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grandparents</td>
<td>1 (.8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>2 (1.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With parent(s)</td>
<td>32 (24.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apartment or dorm</td>
<td>100 (75.9%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td></td>
<td>45.88 (16.53)</td>
<td>11.25-76.00</td>
</tr>
</tbody>
</table>

**Preliminary Analysis**

Internal consistency reliability of each instrument was assessed. The MASS and PASS scales, SDS, ARSS (diet) and ARSS (exercise) yielded a Cronbach’s alpha that ranged from .74 to .87. Means, standard deviations, and ranges for each scale are presented in Table 2.
Table 2

Summary Statistics of Measures ($N = 132$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean/SD</th>
<th>Range</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAS</td>
<td>4.76 (1.04)</td>
<td>1.68-6.31</td>
<td>.89</td>
</tr>
<tr>
<td>PAS</td>
<td>4.54 (1.19)</td>
<td>1.01-6.31</td>
<td>.87</td>
</tr>
<tr>
<td>SD</td>
<td>3.70 (.58)</td>
<td>2.12-4.55</td>
<td>.74</td>
</tr>
<tr>
<td>AMD</td>
<td>4.46 (1.12)</td>
<td>1.89-6.03</td>
<td>.88</td>
</tr>
<tr>
<td>AME</td>
<td>4.80 (1.01)</td>
<td>1.94-6.03</td>
<td>.87</td>
</tr>
</tbody>
</table>

Note: MAS = maternal autonomy support; PAS = paternal autonomy support; AMD = Autonomous motivation for diet; AME = Autonomous motivation for exercise; SD = Self-determination.

Multiple regression assumption testing was conducted to assess for statistical violations. The data was first examined for normality, linearity, independence, and homoscedasticity. No multiple regression assumption violations were noted. A significance level of $p < .05$ was set a priori to assess each hypothesis.

To explore whether parental autonomy support would be included in each model as one independent variable or analyzed separately based on parental gender, Pearson’s correlation analysis was conducted on the variables of maternal autonomy support (MAS) and paternal autonomy support (PAS). To decrease confusion and ease statistical interpretation, Copeland and White (1991) suggested that the combination of family data to form a single unit of analysis representative of a family construct should only be considered when there is sufficient correlation ($r = .43-.67, p < .01$) between the perceptual scores. In this study, MAS and PAS were moderately (Cohen, 1988) correlated ($r = .33, p < .01$).

Adolescent perceptions of MAS and PAS were also examined to assess whether there were significant differences in perceived autonomy support between mothers and fathers. A paired $t$-test revealed that the adolescents perceived mothers as more autonomy
supportive than fathers ($t = 2.327, p = .02$). Differences noted in adolescent perceptions of autonomy support between parental figures indicated that each parent’s perceived autonomy support should be examined separately for the remaining analyses.

Pearson’s correlations were conducted to assess for significant relationships among demographic characteristics, independent variables (MAS and PAS) and dependent variables of adolescent motivation for diet (AMD) and adolescent motivation for exercise (AME). It was determined a priori that only demographic variables significantly correlated with the outcome variable(s) would be controlled for in each model. Age, gender, residence, family structure, ethnicity, college status, and SES were assessed to evaluate their relationship with the dependent variables, AMD and AME, as well as the independent variables of MAS and PAS.

Age ($r = .186, p < .05$) was the only demographic variable significantly correlated with autonomy support. Older adolescents perceived higher MAS. Four demographic variables were found to be significantly associated with the dependent variables, motivation for diet and/or exercise. Age was positively associated with diet ($r = .291, p < .001$) and exercise ($r = .187, p < .05$); older adolescents displayed higher levels of autonomous motivation for those health behaviors. Gender ($r = .202, p < .05$) was also associated with motivation for diet, but not exercise. Females were more likely to be motivated to display healthier diet behaviors. Family structure ($r = .223, p < .001$) was also significantly correlated with motivation for diet. Adolescents from biological two-parent homes demonstrated less motivation for healthier diet behaviors than those from other family structures. Socioeconomic status, college rank, residence and ethnicity were
not related to the major study variables and were therefore excluded from further
analyses.

Pearson correlations were utilized to assess for bivariate relationships between the
main independent and dependent variables. MAS ($r = .235, p < .01$) and PAS ($r = .181, p
< .05$) were significantly correlated to motivation for exercise, but neither were
significant in the adolescent’s motivation for a healthy diet.

Pearson’s correlations were also conducted to assess bivariate associations of the
mediating variable (self-determination) with the demographic, independent (MAS and
PAS) variables and dependent (motivation for diet and exercise behaviors) variables.
Self-determination was not associated with any demographic variable. MAS ($r = .439, p
< .001$) and PAS ($r = .381, p < .001$) were positively correlated with adolescent self-
determination. Adolescents who perceived higher levels of MAS and PAS demonstrated
greater self-determination. Self-determination was also positively associated with
motivation for diet ($r = .176, p < .05$) and exercise behaviors ($r = .209, p < .05$);
adolescents with higher self-determination exhibited higher motivation for their dietary
and exercise behaviors. Table 3 displays the bivariate correlations among all of the study
variables.
### Table 3

**Intercorrelation of Study Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants (N = 132)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Age</td>
<td></td>
<td>0.09</td>
<td>0.065</td>
<td>0.151</td>
<td>-0.180*</td>
<td>0.643**</td>
<td>0.082</td>
<td>0.186*</td>
<td>0.136</td>
<td>-0.004</td>
<td>0.291**</td>
<td>0.187*</td>
</tr>
<tr>
<td>2. Gender</td>
<td>0.009</td>
<td></td>
<td>0.062</td>
<td>0.121</td>
<td>0.062</td>
<td>-0.012</td>
<td>0.024</td>
<td>0.024</td>
<td>0.116</td>
<td>-0.050</td>
<td>0.202*</td>
<td>0.015</td>
</tr>
<tr>
<td>3. Residence</td>
<td>0.065</td>
<td>0.062</td>
<td></td>
<td>0.338**</td>
<td>-0.185*</td>
<td>0.201*</td>
<td>0.166</td>
<td>0.128</td>
<td>-0.010</td>
<td>-0.062</td>
<td>-0.097</td>
<td>-0.086</td>
</tr>
<tr>
<td>4. Ethnicity</td>
<td>0.151</td>
<td>0.121</td>
<td>0.338**</td>
<td></td>
<td>0.076</td>
<td>0.180*</td>
<td>0.117</td>
<td>0.087</td>
<td>0.092</td>
<td>0.031</td>
<td>0.072</td>
<td>0.059</td>
</tr>
<tr>
<td>5. Family Structure</td>
<td>-0.180*</td>
<td>0.062</td>
<td>-0.185*</td>
<td>0.076</td>
<td></td>
<td>-0.166</td>
<td>-0.153</td>
<td>0.007</td>
<td>-0.151</td>
<td>-0.025</td>
<td>0.223**</td>
<td>0.118</td>
</tr>
<tr>
<td>6. College Rank</td>
<td>0.643**</td>
<td>-0.012</td>
<td>0.201*</td>
<td>0.180*</td>
<td>-0.166</td>
<td></td>
<td>0.019</td>
<td>0.114</td>
<td>0.078</td>
<td>-0.018</td>
<td>0.147</td>
<td>0.025</td>
</tr>
<tr>
<td>7. Socioeconomic Status</td>
<td>0.082</td>
<td>0.024</td>
<td>0.166</td>
<td>0.117</td>
<td>-0.153</td>
<td>0.019</td>
<td>1</td>
<td>-0.037</td>
<td>0.015</td>
<td>-0.084</td>
<td>0.010</td>
<td>0.068</td>
</tr>
<tr>
<td>8. MAS</td>
<td>0.186*</td>
<td>0.024</td>
<td>0.128</td>
<td>0.087</td>
<td>0.007</td>
<td>0.114</td>
<td>-0.037</td>
<td></td>
<td>0.334**</td>
<td>0.439**</td>
<td>0.164</td>
<td>0.235**</td>
</tr>
<tr>
<td>9. PAS</td>
<td>0.136</td>
<td>0.116</td>
<td>-0.010</td>
<td>0.092</td>
<td>-0.151</td>
<td>0.078</td>
<td>0.015</td>
<td>0.334**</td>
<td></td>
<td>0.381**</td>
<td>0.112</td>
<td>0.181*</td>
</tr>
<tr>
<td>10. SD</td>
<td>-0.004</td>
<td>-0.050</td>
<td>-0.062</td>
<td>0.031</td>
<td>-0.025</td>
<td>-0.018</td>
<td>-0.084</td>
<td>0.439**</td>
<td>0.381**</td>
<td></td>
<td>0.176*</td>
<td>0.209*</td>
</tr>
<tr>
<td>11. AMD</td>
<td>0.291**</td>
<td>0.202*</td>
<td>-0.097</td>
<td>0.072</td>
<td>0.223**</td>
<td>0.147</td>
<td>0.010</td>
<td>0.164</td>
<td>0.112</td>
<td>0.176*</td>
<td></td>
<td>0.677**</td>
</tr>
<tr>
<td>12. AME</td>
<td>0.187*</td>
<td>0.015</td>
<td>-0.086</td>
<td>0.059</td>
<td>0.118</td>
<td>0.025</td>
<td>0.068</td>
<td>0.235**</td>
<td>0.181*</td>
<td>0.209*</td>
<td>0.677**</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05, ** p < .01.
Notes: AMD = Autonomous motivation for diet; AME = Autonomous motivation for exercise MAS = Maternal autonomy support; PAS = Paternal autonomy support; SD = Self-Determination
Hypothesis Testing

Research Hypothesis 1: The null hypothesis stated that older adolescents’ perceived parental autonomy support is not positively related to the adolescents’ autonomous motivation for healthy dietary behaviors. The alternative research hypothesis stated that older adolescents’ perceived parental autonomy support is positively related to the adolescent’s motivation for healthy dietary behaviors.

Hierarchical multiple regression analysis was used to assess the relationship of the independent variables (MAS and PAS) to the dependent variable, AMD. To maximize power, only demographic variables significantly correlated ($p = .05$) with autonomous motivation for diet were entered into the first step of the model. The demographic variables that were significantly correlated with the adolescent’s motivation for diet were adolescent age, adolescent gender, and family structure, and were entered in step 1 of the model. MAS and PAS were entered in the second block. The overall $F (5, 127)$ of 6.70, $p < .001$, was significant. The demographic variables demonstrated a positive relationship, yielded an adjusted $R^2$ of .196 and accounted for 20% of the variance in the model. The addition of MAS and PAS did not significantly contribute to the model. Neither MAS ($t = .906, p = .336$) nor PAS ($t = .763 p = .447$) $\beta$ weights were significant. Therefore, the null hypothesis was accepted (Table 4).
Table 4

Summary of Multiple Regression Analysis of Parental Autonomy Support Predicting Adolescent Autonomus Motivation for Diet

<table>
<thead>
<tr>
<th>Predictor</th>
<th>ΔR²</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.196</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>.316***</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>.172***</td>
</tr>
<tr>
<td>Family structure</td>
<td></td>
<td>.278*</td>
</tr>
<tr>
<td>Step 2</td>
<td>.013</td>
<td></td>
</tr>
<tr>
<td>MAS</td>
<td></td>
<td>.077</td>
</tr>
<tr>
<td>PAS</td>
<td></td>
<td>.065</td>
</tr>
<tr>
<td>Total R²</td>
<td>.209</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>132</td>
<td></td>
</tr>
</tbody>
</table>

Note: MAS = maternal autonomy support; PAS = paternal autonomy support
*p < .05, ***p ≤ .001.

Research Hypothesis 2: The null hypothesis stated that parental autonomy support does not positively affect adolescent self-determination and that adolescent self-determination does not positively affect adolescent motivation for dietary behaviors. The alternative hypothesis stated that parental autonomy support positively affects adolescent self-determination which then positively affects adolescent motivation for dietary behaviors.

Hierarchical regression analysis was conducted to assess the significance of MAS and PAS in the prediction of adolescent self-determination. None of the demographic variables were significantly correlated with self-determination and therefore were not included in this analysis. MAS and PAS were entered into the model in step one. The overall $F(2, 130) = 22.21, (p = .001)$ was significant. MAS ($t = 4.374, p < .001$) and PAS ($t = 3.283, p < .001$) each yielded significant beta weights and explained 26% of the variance in the model (Table 5).
Next, hierarchical multiple regression analysis was conducted to assess the indirect relationship of parental autonomy support with AMD through self-determination. First, the demographic variables significantly correlated to adolescent motivation for diet (age, gender, and family structure) were entered into the model. Second, MAS and PAS were entered into the model. Lastly, self-determination was entered into the model. The overall $F(6, 126)$ was $6.409, (p < .001)$; however, MAS ($t = .099, p = .921$) and PAS ($t = .143, p = .886$) $\beta$ weights were not significant. Mackinnon, Fairchild, and Fritz (2007) described mediation as the addition of third variable to an $X \rightarrow Y$ relationship. If the $X \rightarrow Y$ relationship does not exist, mediation is not possible. Therefore, self-determination cannot be considered as a possible mediator between parental autonomy support and adolescent motivation for diet behavior. The null hypothesis was accepted; however, a significant positive relationship of parental autonomy support with self-determination ($p < .001$) as well as of self-determination with AMD ($t = 2.207, p < .05$) was found (Table 6).

### Table 5

*Summary of Hierarchical Multiple Regression of Parental Autonomy Support Predicting Adolescent Self-Determination*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\Delta R^2$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAS</td>
<td>.193</td>
<td>.351***</td>
</tr>
<tr>
<td>PAS</td>
<td>.062</td>
<td>.264***</td>
</tr>
<tr>
<td>Total $R^2$</td>
<td>.255</td>
<td></td>
</tr>
<tr>
<td>$N$</td>
<td>132</td>
<td></td>
</tr>
</tbody>
</table>

Note: MAS = maternal autonomy support; PAS = paternal autonomy support

***$p \leq .001$. 

The overall $F(6, 126)$ was $6.409, (p < .001)$; however, MAS ($t = .099, p = .921$) and PAS ($t = .143, p = .886$) $\beta$ weights were not significant. Mackinnon, Fairchild, and Fritz (2007) described mediation as the addition of third variable to an $X \rightarrow Y$ relationship. If the $X \rightarrow Y$ relationship does not exist, mediation is not possible. Therefore, self-determination cannot be considered as a possible mediator between parental autonomy support and adolescent motivation for diet behavior. The null hypothesis was accepted; however, a significant positive relationship of parental autonomy support with self-determination ($p < .001$) as well as of self-determination with AMD ($t = 2.207, p < .05$) was found (Table 6).
Table 6

*Summary of Hierarchical Multiple Regression Analysis of Adolescent Autonomous Motivation for Diet Incorporating Self-Determination as a Mediator*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\Delta R^2$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.196</td>
<td>.337***</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td>.278***</td>
</tr>
<tr>
<td>Family Structure</td>
<td></td>
<td>.189***</td>
</tr>
<tr>
<td>Step 2</td>
<td>.013</td>
<td>.009</td>
</tr>
<tr>
<td>MAS</td>
<td></td>
<td>.013</td>
</tr>
<tr>
<td>PAS</td>
<td></td>
<td>.013</td>
</tr>
<tr>
<td>Step 3</td>
<td>.025</td>
<td>.186*</td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total $R^2$</td>
<td>.234</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>132</td>
<td></td>
</tr>
</tbody>
</table>

Note: MAS = maternal autonomy support; PAS = paternal autonomy support; SD = self-determination.

*p < .05, ***p < .001.

Research Hypothesis 3: The null hypothesis stated that older adolescents’ perceived parental autonomy support is not positively related to the adolescents’ motivation for healthy exercise behaviors. The alternative research hypothesis stated that older adolescents’ perceived parental autonomy support is positively related to the adolescents’ motivation for health exercise behaviors.

Hierarchical multiple regression analysis was utilized to evaluate the relationship of the dependent variable, adolescent motivation for exercise, with the predictor variables. First, age, the only demographic variable significantly correlated with adolescent motivation for exercise, was entered into the model. Second, MAS and PAS were entered into the model. The overall $F$ (3, 129) was 4.096 ($p = .009$). Age displayed a non-significant but positive relationship ($t = 1.638, p = .104$) with the adolescent’s motivation for exercise and accounted for 4% of the variance. The addition of the
parental variables was not significant in contributing the prediction of AME. Neither
MAS ($t = 1.929$, $p = .056$) nor PAS ($t = 1.154$, $p = .251$) $\beta$ weights were significant (Table 7); therefore, the null hypothesis was accepted.

Table 7

*Summary of Hierarchical Regression Analysis of Parental Autonomy Support Predicting Adolescent Autonomous Motivation for Exercise Behaviors*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\Delta R^2$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.035</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>.141</td>
</tr>
<tr>
<td>Step 2</td>
<td>.042</td>
<td></td>
</tr>
<tr>
<td>MAS</td>
<td></td>
<td>.174</td>
</tr>
<tr>
<td>PAS</td>
<td></td>
<td>.103</td>
</tr>
<tr>
<td>Total $R^2$</td>
<td>.077</td>
<td></td>
</tr>
<tr>
<td>$N$</td>
<td>132</td>
<td></td>
</tr>
</tbody>
</table>

Note: MAS = maternal autonomy support; PAS = paternal autonomy support
*p < .05.

Research Hypothesis 4: The null hypothesis stated that parental autonomy support does not positively affect adolescent SD which then does not positively affect adolescent motivation for exercise behaviors. The alternative hypothesis stated that parental autonomy support positively affects adolescent self-determination which then positively affects adolescent motivation for exercise behaviors.

The relationship of parental autonomy support to self-determination was examined in hypothesis 3 where it was established that MAS and PAS ($p < .001$) were significant in the prediction of adolescent self-determination. Hierarchical multiple regression analysis was again performed to examine the significance of self-determination in the prediction of adolescent motivation for exercise behaviors. The procedure described for the analysis of hypotheses 2 was repeated for steps 1 and 2. Self-Determination was added in step 3. The total $F (4, 128)$ was $3.472$ ($p = .10$). None of the
variables in this model reached significance (Table 8); therefore, the null hypothesis was accepted.

Table 8

<table>
<thead>
<tr>
<th>Predictor</th>
<th>$\Delta R^2$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>.035</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.155</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.051</td>
<td></td>
</tr>
<tr>
<td>MAS</td>
<td>.127</td>
<td></td>
</tr>
<tr>
<td>PAS</td>
<td>.069</td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>.012</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>.127</td>
<td></td>
</tr>
<tr>
<td>Total $R^2$</td>
<td>.098</td>
<td></td>
</tr>
<tr>
<td>$N$</td>
<td>132</td>
<td></td>
</tr>
</tbody>
</table>

Note: MAS = maternal autonomy support; PAS = paternal autonomy support; SD = self-determination.

Summary

Results of the descriptive analysis consisted of a demographic overview of the adolescent’s age, gender, residence, ethnicity, family structure, college rank, and socioeconomic status. Pearson correlational analysis was conducted to assess relationships among all study variables. Results were discussed based on significance. MAS and PAS displayed a moderate bivariate correlation. In addition, a paired $t$-test demonstrated that adolescents perceived mothers as more autonomy supportive than fathers ($t = 2.03, p = .04$) and provided evidence to support the independent evaluation of MAS and PAS in each model.

Hierarchical regression analysis indicated that a relationship existed between the independent variables of age, gender, and family structure and the dependent variable,
AMD. Together, these variables accounted for 20% (p < .05) of the variance in the model. Although age was the only demographic variable associated with AME it was not significant in the multiple regression analysis. MAS and PAS collectively ($F = 22.21, p = .001$) were predictive of adolescent self-determination and accounted for 26% of the variance in the model. Self-determination was significant in the prediction of AMD and accounted for 3% of the variance in the model but was not significant in the prediction of AME.
CHAPTER 5
DISCUSSION

The purpose of this study was to examine the relationship of parental autonomy support and the motivation for diet and exercise behaviors in older adolescents and to assess whether the adolescent’s self-determination mediates the relationship between parental autonomy support and their motivation for diet and exercise behaviors. The sample included 132 freshman and sophomore college students from an urban 4-year college in the Southeast. The instruments used in the study were the POPS autonomy support subscales, SDS, Autonomous Regulation Scale for diet and exercise, and a demographic questionnaire. The supporting theoretical framework for the study was Self-Determination Theory. SPSS version 15 was used to generate descriptive statistics, Pearson’s product correlations, t-tests, and hierarchical regression models; hierarchical regression was executed to test each hypotheses. This chapter includes a discussion of the findings from the sample, hypotheses, findings for the supporting theoretical framework; and a discussion of the conclusions, limitations, and recommendations.

Sample
The participants were primarily 18 year-old Caucasian, freshman, female (n = 100) college students from 2-parent middle-class families. Although there were a larger number of female (64.7%) participants in comparison to males (35.3%), the sample group’s gender composition resembled the gender distribution of the college (National Center for Educational Statistics, 2009).
The ethnicity of the sample group was 58% Caucasian, 40% African-American, and 2% Asian. The large percentage of African-American participants is the major difference in the ethnic distribution between the sample group and the university. The University’s enrollment of students included 64% Caucasian, 27% African-American, 1% Hispanic, 1% Asian, and .5% American Indian, and 2.2% non-resident alien, and 4.3% unreported (National Center for Educational Statistics, 2009). The population of the state is distributed similarly to the population of the university, i.e., 71% Caucasian, 26% African-American, 2.9% Hispanic, .5% American Indian, and 1% Asian (U.S. Census Bureau, 2008a). Core English classes were selected based on freshman/sophomore enrollment, availability, and time constraints. Two of the eight classes from which participants were recruited were 60 - 65 % African American and resulted in an overrepresentation of the minority group in comparison to other classes.

The family structure of the sample group primarily consisted of 2 biological parents (68.4%); however, other family structures were represented. Family structures including step-parent families (20.3%), single-parent families (6.8%), adoptive families, (2.3%) grandparent families (.8%) and families with other extended family members serving as parents (1.5%) were also reported. Nationally, 60% of youth live in 2-parent biological families, 8% of youth live in step-parent families, 26% of youth live in single-parent families, 4.4% of youth live in grandparent families, and 2.6% of youth live in foster families (US Census Bureau, 2004). The sample’s family structure differed from national statistics; the sample was over-representative of step-parent families and was under-representative of single-parent families.

Socioeconomic status evaluated by the Hollingshead Index (1965) indicated that participants were members of families whose socioeconomic status ranged from lower to
upper SES; however, students from middle class families were the most represented group. Nationally, college freshman tend to come from more financially advantaged families with a median income 60% higher than the national average (Pryor, Hurtado, Saenz, Santos, and Korn, 2007). The current sample’s socioeconomic status reflected less financially advantaged students than the national average.

Assessment of Measures

The current study evaluated parental autonomy support utilizing the POPS College-Student Autonomy Support Subscales: (a) the MASS scale and (b) the PASS scale (Robbins, 1994). These instruments were developed specifically for the older adolescent population and assess general adolescent perceived parental autonomy support. Thus, the scales are not specific to health-related autonomy support.

For this study, Cronbach’s alpha reliability was .89 for the MASS and .87 for the PASS, which is consistent with, but higher than the internal reliability of .80 (MASS) and .83 (PASS) reported by Robbins (1994). The MASS scores ranged from 1.68-6.31 and resulted in a mean score of 4.76. The PASS scores ranged from 1.01-6.31 and resulted in a mean of 4.54. Robbins (1994) similarly reported a higher mean score for MAS, in comparison to PAS, in a similar sample. Adolescents in this study perceived moderate levels of parental autonomy support from both mothers and fathers.

The SDS was utilized to measure adolescent self-determination. Scores ranged from 2.12-4.55 (M = 3.70) and indicated that the participants in this sample perceived themselves to be moderately self-determined. Cronbach’s alpha reliability was .74. The SDS has been assessed in both adult (Mata, Silva, Vieira, Carraça, Andrade et al. 2009;
Sheldon & Deci, 1996; Sheldon et al., 1996) and adolescent populations (Thrash & Elliott, 2002). Thrash and Elliott reported an internal reliability of .80 for the SDS.

Two versions of the ARSS were used to assess adolescent motivation for diet behavior and adolescent motivation for exercise behavior. Diet scores ranged from 1.89-6.03 ($M = 4.46$). Exercise scores ranged from 1.94-6.03 ($M = 4.80$) Cronbach’s alpha reliability was .88 (diet) and .87 (exercise). Levesque, Williams, Elliot, Pickering, & Bodenhamer et al. (2007) utilized the complete TSRQ scale, but also assessed measurement variability and reliability of each of the TSRQ’s subscales in a sample of college students from 4 different universities, across three health behaviors (smoking, diet, and exercise). Levesque et al. (2007) reported that the ARSS for diet and exercise’s internal reliability ranged from .85 - .93. In addition, the study found similar mean scores (diet, $M = 4.06$; exercise, $M = 4.07$) in a sample from a southeastern university.

Preliminary Analysis

The similarity of adolescent perceptions of each parent’s autonomy support was assessed. Pearson’s correlation coefficient between MAS and PAS was $r = .334$ ($p < .01$) and suggested that a moderate, positive, linear relationship existed between MAS and PAS. In essence, adolescents who viewed their mothers as autonomy supportive also tended to view their fathers as autonomy supportive. Adolescents who perceived their mothers as less autonomy supportive, also perceived less autonomy support from their fathers.

To evaluate differences in adolescent perceptions of MAS and PAS, a paired t-test was performed. Findings indicated that adolescents tended to view mothers as significantly more autonomy supportive than fathers ($t = 2.04, p = .04$). Prior studies that
have compared adolescent perceptions of parental autonomy support based on parental
gender have reported mixed findings. Three other studies (Niemiec et al., 2006; Robbins,
1994; Vallerand et al., 1997) that examined middle and older adolescents, have similarly
reported that adolescents perceived mothers as more autonomy supportive, in comparison
to fathers. Robbins and Niemiec et al. examined the parental autonomy construct utilizing
similar methods as the present study; however, Vallerand et al. operationalized the
parental autonomy support construct with an adaptation from the Perceived Interpersonal
Style Scale (Pelletier, 1992). Collectively, these findings suggest that adolescents
perceive parental autonomy support differently based on whether they are considering
their mothers’ or their fathers’ parenting.

Motivation for Healthy Dietary Behavior

Hypothesis 1

Hypothesis 1 stated that older adolescents’ perceived parental autonomy support
is positively related to these adolescents’ motivation for healthy dietary behaviors. Age,
gender, and family structure were significantly correlated with AMD in the bivariate
analysis and were, therefore, included in the regression model. All three demographic
variables were significantly predictive of AMD, with age being the strongest predictor.
Collectively, age, gender, and family structure accounted for 20% of variance in the
regression model.

Age was significant in the model prediction of AMD. The sample was
comprised of older adolescents aged 18-20 ($M = 18.52$). While the age range was narrow,
findings suggested older adolescents were more motivated to eat a healthier diet than
were younger participants. Backman et al. (2002) evaluated psychosocial predictors of a
healthy diet in a sample of adolescents aged 14-19. Their study found that younger adolescents’ perception of their diet was not congruent with their self-reported dietary choices and suggested that adolescent understanding of nutrition and dietary consumption choices may improve with age. The significant and positive relationship of age on AMD may be due to an increase in nutritional knowledge that is gained as the adolescent matures.

Gender was also significant in the prediction of AMD. Females were more likely to be motivated for a healthy diet than were males. Increased female, in comparison to male, motivation for a healthier diet is well documented in the literature (Backman et al., 2002; Dennison & Shepherd, 1995; Davy, Benes, & Driskell, 2006; Jackson, Berry, & Kennedy, 2009). In a study of middle and older adolescents, Backman et al. found that adolescent females conveyed a more positive attitude toward more nutritional food choices, expressed greater intentions to eat a more nutritious diet, and consumed fewer calories in comparison to adolescent males. In a similar study, Dennison and Shepherd found that females displayed more positive attitudes toward healthier food choices and were more conscientious in their dietary intake than were males. In a sample of university students, Jackson et al (2009) found that males were more likely to eat fast foods in comparison to females. Also in a sample of university students, Davy, Benes, & Driskell reported that a significantly higher percentage of college females, in comparison to males, implemented low-fat, low carbohydrate diets, were more likely to seek nutrition information from family members, and reduced fat intake to lose weight.

Family structure was also significant in the prediction of AMD. Surprisingly, findings suggested that adolescents from 2-parent biological families displayed less motivation for healthy dietary behaviors than those from other family structures. While
few studies have examined the influence of family structure on dietary behavior in the adolescent population, previous reports have found that adolescents from 2 biological parent families and 2 parent adoptive families displayed healthier dietary habits than those from single or step parent family structures (Stewart & Menning, 2009). However, these effects were partially mediated when non-resident fathers were more involved in their adolescent’s lives. Strauss & Knight (1999) found that obesity was higher in children and adolescents who did not have a father living in the home. In addition, previous reports have suggested that step-parents are less involved in the health of the child or adolescent (Anderson, Kaplan, & Lancaster, 1999); stepfathers were less involved with child and adolescent health than were stepmothers (Stewart & Manning).

The finding that adolescents from 2 biological families demonstrated less motivation for healthy dietary behavior, in comparison to all other family structures, may be partially explained by the operationalization of this nominal variable. Only two-parent biological families were specifically examined in the analysis. Non-resident parental involvement was not assessed in single-parent families. In addition, step-parent families, 2-parent adoptive families and families in which 2 grandparents serve as parents were also not examined separately. The combination multiple family structures in the operationalization of this variable may have led to inflated significance of the non 2-parent biological family structures.

Positive relationships between parental autonomy support and the dependent variable, AMD, were demonstrated in bivariate analyses; however, statistical significance was not reached in the regression analyses. There are several possible explanations for this unanticipated finding. The parent-adolescent relationship begins a transformation as the older adolescent gradually becomes more independent (Baumrind, 2005; Feldman &
Rosenthal, 1991). As adolescents transition to a more independent educational setting and prepare to leave the parental residence, other social factors may exhibit more influence on adolescent dietary motivation than parental autonomy support. Autonomy support from romantic significant others and peers has demonstrated a positive relationship with dietary changes and weight loss in college women (Powers, Koestner, & Gorin, 2008). Specifically, college females have been found to exercise more, eat healthier foods, and to watch their weight when they perceive greater friend and peer support (Gruber, 2008). In comparison, males did not perceive significant social support from their peers related to dietary behaviors. Males were more motivated to eat healthier to prepare for a sport. Other studies have reported that antecedents, such as attitude toward a healthy diet, perceived social norms, knowledge about how to eat healthful food, and access to sufficient funds (Backman, Haddad, Lee, Johnston, & Hodgkin, 2002) influence the dietary choices of older adolescents. An alternative explanation is that the measure of parental autonomy support was too generalized and did not assess autonomy support as it pertained to specific health behaviors. The findings of this study suggest that parental autonomy support may exhibit less concurrent influence on AMD in college-aged individuals and that AMD may be more influenced by other factors, such as peer relationships and social norms, which are relative to adolescent development, especially when adolescents live outside the parental residence, as did the majority of the sample in this study.

Parental autonomy support has previously been related to adolescent behaviors other than dietary behaviors. Previous works that have examined middle to late adolescent and young adult populations have reported that parental autonomy support may indirectly influence adolescent outcomes and decision-making by directly impacting
adolescents in more general ways such as through perceptions of self, autonomy orientations, and internalization of values (Downie et al., 2007; Robbins, 1994). Other studies have utilized a cross-sectional, correlational design to observe middle and older adolescent populations have suggested that parental autonomy support may be an important antecedent in adolescent development and influence adolescent attributes such as internalization of identification regulation and intrinsic motivation (Chirkov & Ryan, 2001), competence (Soenens & Vansteenkiste, 2005; Vallerand et al, 1997), self-regulation (Niemiec, 2005; Vansteenkiste et al., 2005), locus of causality (Hagger et al, 2007), and autonomy orientation (Gagne, 2003). In turn, these potentially mediating variables have been linked to persistence and achievement in academics, engagement in prosocial behavior, and other indicators of adolescent well-being and adjustment; thus, general perceptions of parental autonomy support may be more influential in shaping self-determination in the decision making process in general and may be less significant in the prediction of a specific health behavior. Alternatively, a causal relationship between parental autonomy support and AMD may exist but the lack of evaluation of perceived autonomy support specific to health decisions may have hindered the analysis.

Hypothesis 2

Hypothesis 2 stated that parental autonomy support positively affects adolescent self-determination which then positively affects motivation for dietary behaviors. Self-determination was evaluated as a mediating variable between parental autonomy support and adolescent motivation for diet. The unexpected lack of a direct relationship between the independent variables (MAS and PAS) and the dependent variable, adolescent
motivation for diet, nullified self-determination as a potential mediator; however, points for discussion were noted.

The current study found that both MAS and PAS were significant ($p < .001$) predictors of adolescent self-determination and accounted for 26% of the variance in the model. The positive relationship between parental autonomy support and adolescent self-determination is consistent with the findings of previous studies that operationalized the perception of parental autonomy support construct similar to the present study and were conducted on high school and undergraduate college student samples (Roth, 2008; Soenens et al., 2007; Soenens & Vansteenkiste, 2005). In these studies, perceptions of greater parental autonomy support were predictive of greater adolescent self-determination. However, unlike the present study, increased adolescent self-determination in these studies was, in turn, predictive of outcomes, such as increased altruistic helping of others (Roth), enhanced adolescent psychological functioning and increased scholastic competence (Soenens & Vansteenkiste). The findings of the current study, in conjunction with previous research, suggest that parental autonomy support remains important to adolescent internalization of beliefs and attitudes even as they prepare to enter into adulthood; however, while parental autonomy support does significantly influence adolescent self-determination, a large percent of variability related to adolescent self-determination is still unknown.

While the current study found that adolescents perceived mothers as more autonomy supportive in comparison to fathers, both parental variables were significantly related to adolescent self-determination; however, other studies have reported varied adolescent outcomes when parental gender was considered. Niemiec et al, (2006) examined the impact of perceived maternal and paternal needs support on adolescent
well-being in a group of high school juniors and seniors. The researchers utilized the POPS (Robbins, 1994) to examine the parental need support. Niemiec et al. reported that perceived parental need support independently predicted adolescent well-being and that maternal perceived need support was more influential than was paternal perceived need support. Other studies (Abad & Sheldon, 2008; Roth, 2008) that have examined differences in adolescent perceptions of MAS and PAS have reported little or no difference between perceptions of parental figures; however, Abad and Sheldon’s study reported a difference in an adolescent outcome when parental gender was considered. In a sample of college-aged 2nd generation immigrant adolescents raised in the United States, found that perceived need support between parental figures was similar, only paternal need support was predictive of ethnic society immersion, natal culture immersion, happiness, and life satisfaction.

In the regression analysis, self-determination was significant in the prediction of adolescent motivation for diet behavior and accounted for 3% of the variance in the overall model. This finding suggests that older adolescents who exhibit higher levels of self-determination may be more likely to be motivated to partake in a healthier diet than adolescents with lower levels of self-determination. The findings of the present study supports previous research (Hagger et al., 2006b) that examined global-level psychological needs satisfaction on contextual-level autonomous motivation. The researchers reported that relative autonomy in decision making (self-determined decision making) was a significant antecedent to dietary attitude and perceived dietary behavioral control. In turn, dietary attitude and dietary perceived behavioral control were predictive of dietary intentions and dietary intentions were predictive of a more healthy diet. Furthermore, the direct influence of autonomous motivation on attitudes was not
impacted by the adolescent’s perceived behavioral control at the situational level; thus, an adolescent’s general self-determination regarding a behavior is not influenced by a particular external influence. The findings of the current study concur with the conclusions of Hagger et al. study and may suggest that adolescent internalization of the importance of healthy dietary behavior may positively influence motivation for a healthier diet; however, while the 3% of variance accounted for by self-determination in the regression was significant, there is still much to be learned about adolescent dietary motivations.

Motivation for Exercise Behavior

Hypothesis 3

Hypothesis 3 stated that older adolescents’ perceived parental autonomy support is positively related to these adolescents’ motivation for exercise behaviors. Age was identified as a significant demographic variable in the bivariate analysis and but was not significant in the regression model. No relationship was noted between parental autonomy support and adolescent motivation for exercise. Previous research examining the impact of autonomy support on adolescent exercise behaviors has primarily assessed the role of teacher autonomy support. Hagger et al. (2003) evaluated teacher autonomy support on middle adolescents’ exercise motivation and reported increased perceived teacher autonomy support was not only related to increased identified and intrinsic motivation for exercise in the educational setting, but was also related to increased identified and intrinsic motivation for exercise during leisure time. A previous study of older adolescents (Edmunds et al., 2007) targeted the role of teacher autonomy support and how it impacted adolescent motivation for physical activity. Edmunds et al.
incorporated a quasi-experimental, cross-sectional study design and compared the impact of an autonomy supportive teaching style, versus a controlled teaching style, on exercise attitudes, internalization, and frequency. Participants in the experimental group, compared to the control group, reported higher levels of interpersonal involvement, competence, and relatedness. In addition, participants in the experimental group also demonstrated greater identified regulation and attended the exercise more frequently than those in the control group. In a sample of middle adolescents, Hagger et al. (2007) evaluated teacher, parent, and peer autonomy support for exercise behaviors during leisure time and found that all three sources of autonomy support were significant; however, peer and parent autonomy support sources were more strongly correlated with integrated and intrinsic motivations for exercise during leisure time than were teacher sources of autonomy support. Interestingly, peer autonomy support displayed the strongest relationship with adolescent intrinsic exercise motivation for exercise behaviors. Results of the current study suggest that general perceptions of parental autonomy support may not play a significant role in adolescent motivation for exercise in college students. Teacher and peer autonomy support, in comparison to parental autonomy support, may be better predictors of exercise motivation in older adolescents.

While no studies were located that have examined parental autonomy support as a significant antecedent in adolescent motivation for exercise in college-aged adolescents, the positive relationship between parental autonomy support and a variety of academic outcomes has been consistent (Soenens & Vansteenkiste, 2005; Vansteenkiste et al., 2005). The influence of parental autonomy support on academic motivation, but not health-related motivation, suggests that the importance of academic motivation and academic success may be more internalized; and thus more valued, in older adolescents.
than health-related motivation. The greater association of parental autonomy support and adolescent internalization of academic outcomes suggest that the home environment and parental figures may be more concerned with and focused on adolescent academic achievement than health promotion behaviors. Furthermore, the higher level of adolescent academic internalization, in comparison to exercise internalization, that occurs during adolescence may indicate that parents are less influential in fostering the internalization of values related to motivation for exercise and/or that other factors in the social environment may dilute the effect parents can have.

**Hypothesis 4**

Hypothesis 4 stated that parental autonomy support positively affects adolescent self-determination which then positively affects motivation for exercise behaviors. Self-determination was evaluated as a mediating variable between parental autonomy support and adolescent motivation for exercise. The lack of a direct relationship between the independent variables (MAS and PAS) and the dependent variable, AMD, precluded self-determination from being considered as a mediator.

Self-determination was not significant in the regression analysis predicting adolescent motivation for exercise; however, other studies have reported that exercise behavior in adolescents may be largely influenced by extrinsic motivations. In a sample of undergraduate and graduate students, Hagger et al. (2006b) conducted a cross-sectional, correlational study that examined the impact of relative autonomous motivation on the intentional behaviors of diet and exercise. The researchers assessed all three psychological needs (autonomy, competence, and relatedness) and examined how the fulfillment of those needs impacted motivation for diet and exercise behaviors. The
researchers reported that increased relative autonomy was positively related to exercise intentions. In the same study, Hagger et al. also found that subjective norms (extrinsic motivations), such as perceived pressure to loose weight or to feel more confident in their looks, also independently predicted exercise intentions. Exercise intentions were predictive of more frequent exercise. These findings suggested that both intrinsic and extrinsic motivations play a role in the exercise behaviors of older adolescents and young adults. The current study evaluated autonomous motives for adolescent exercise behavior. If exercise behaviors are primarily extrinsically motivated in the older adolescent, self-determination may not be influential.

A second study (Gillison, Osborn, Standage, & Skevington, 2009) examined the relationship of introjected regulation on the exercise behaviors in middle adolescents. Qualitative interviews were conducted to explore motivations for exercise behaviors. Adolescents were grouped based on their motivation regulation (e.g., intrinsic, identified, introjected and external) for exercise. The researchers found that introjected motivations, as well as intrinsic motivation, were predictive of exercise frequency; however, adolescents who reported more introjected motives for exercise participated in exercise more frequently than adolescents who exercised for intrinsically motivated reasons. Introjected motivations varied across gender: males reported avoidance of social repercussions (e.g., social disapproval and attaining ego enhancement) as the reason they pursued physical activity while females cited body attributes (e.g., weight loss) as their primary motivation for physical activity. These findings suggested that perceived social pressures and conformity to social norms may be primary antecedents to physical activity motivation in the older adolescent population. The association of introjected regulation with increased exercise frequency can be partially explained within the SDT framework;
SDT postulates that introjected motivation falls along a continuum of behavior internalization (Deci, Eghrari, & Patrick, 1994) and that behaviors that are continued may become more intrinsically motivated over time.

Other studies have reported findings that support the relationship between self-determination and exercise. Gillison, Standage, & Skevington (2006) examined the impact of intrinsic and extrinsic goals on self-determination of middle adolescents and the relationship of the adolescent’s self-determination on exercise behaviors and quality of life. The researchers reported that adolescents who exhibited intrinsic goals for participating in physical activity demonstrated higher levels of motivation towards exercise. Increased motivation for exercise resulted in more exercise participation; in addition, the study also reported extrinsic motivations (e.g., perceptions of being overweight and feeling pressured to lose weight) positively influenced extrinsic goals for exercise. In turn, extrinsically motivated goals were negatively related to adolescent self-determination. Decreased adolescent determination was predictive of decreased exercise frequency and decreased quality of life. Markland and Ingledew (2006) reported a similar finding in middle adolescents. These researchers found that adolescents who desired to exercise to achieve a particular body type (extrinsic motivation) exhibited lower levels of exercise motivation. Markland and Ingledew’s findings suggested that failure to achieve a societal pressured body type may be detrimental to exercise motivation.

A possible explanation of the current study’s findings, in comparison to those who reported significant associations between adolescent self-determination and motivation for exercise (Gillison et al., 2006; Markland and Ingledew. 2006), is the difference in how the self-determination construct was operationalized. Gillison et al and Markland and Ingledew examined the adolescent’s self-determination as it specifically
related to exercise. In contrast, the current study evaluated the adolescent’s general self-determination regarding daily life decisions and did not assess self-determination related to any particular behavior.

An alternative explanation regarding the unexpected findings is related to the operationalization of the motivation for exercise construct. The current study assessed adolescent motivation for exercise by the ARSS. This scale examines autonomous reasons an individual engages in a specific behavior. If older adolescents are more extrinsically motivated regarding their exercise behaviors, ARSS would not capture the controlled motivations for desiring to participate in exercise.

Theoretical Framework

The theoretical basis for this study was SDT. According to the theory, individuals are continually striving for fulfillment of three psychological needs: autonomy, competence, and relatedness. Individuals seek out experiences that enhance the realization of the three needs. Persons, behaviors, and life experiences that impact the fulfillment of the autonomy, competence and relatedness are believed to impact the internalization of values, beliefs, and attitudes, and thus, their self-determination. The degree of internalization of a behavior is believed to impact the individual’s engagement and persistence related to the behavior (Ryan & Deci, 2000b).

Parents play a primary role in the socialization and the internalization of values of their children and maturing adolescents (Grolnick, Deci, & Ryan, 1997). SDT posits that autonomy supportive parents are sensitive to their youth’s needs and are willing to provide choices to their child or adolescent during decision-making. The autonomy-supportive parenting style provides an environment that is conducive to the adolescent’s
internalization and development of an autonomously motivated sense of self and, thus, enhances the fulfillment of their adolescents’ three psychological needs: autonomy, competence, and relatedness (Ryan & Deci, 2000b).

Friends and peer networks also play a vital role in adolescent development, including the establishment of autonomy, identity and sense of self (Harter, 1983; Ryan & Lynch, 1989; Schickedanz, Schickedanz, Forsyth, & Forsyth, 2001). Positive peer relationships increase perceptions of adolescent relatedness (Ryan & Deci, 2000b). Socially competent adolescents are able to make and keep friends and to achieve their goals when connecting to others (Dacey, Kenny, & Margolis, 2004). According to SDT, autonomy, competence, and relatedness all positively influence an individual’s self-determination and thus, their ability to internalize attitudes and beliefs (Shahar, Henrich, Blatt, Ryan, & Little, 2003). Competence and relatedness may be additional variables that explain variance in motivation for diet and exercise. The exclusion of competence and relatedness in the current conceptual framework may have hindered the assessment of the adolescent’s motivation for their diet and exercise behaviors.

The relationship between parental autonomy support with adolescent self-determination, supports the proposition in SDT that autonomy supportive environments positively impact adolescent self-determination (Grolnick et al., 1997; Ryan & Deci, 2000b). Both MAS and PAS were predictive of self-determination and accounted for 26% of variance in the model. However, no other significant antecedents of adolescent self-determination were identified from among the demographic variables. Since only 26% of variable variance was accounted for, this suggests that, while parents remain influential in the internalization of attitudes, values, and behaviors in their older
adolescents, other sources of autonomy support, such as peer and significant other support, may also significantly impact self-determination in the older adolescent.

Conceptually, the positive and significant relationship between self-determination and AMD, but not AME, may be best understood by examination of SDT’s propositions in the context of adolescent development. The findings of this study suggest that the importance of healthy nutritional choices may be more internalized, and thus performed for personal motives, than exercise behaviors in the older adolescent. Previous adolescent exercise motivation/behavior research findings have been mixed; however, collectively, it appears that older adolescents are more likely to participate in physical activity for more extrinsically motivated reasons (loose weight, gain muscle) and, thus, the failure to find a relationship between adolescent self-determination and exercise can be interpreted within the SDT framework.

Implications

SDT provided a constructive framework for understanding late adolescent health behavior. The propositions posited within the SDT framework provided direction and guided the interpretation of study findings. Based on the present study, parents continue to play a vital role in older adolescent self-determination; therefore, further examination of the role of family processes in the internalization of behavior in children and adolescents should be expanded. In addition, further explorations of influential antecedents of adolescent self-determination are warranted.

Results of this study revealed that perceived parental autonomy support was not predictive of older adolescents’ motivation for diet or exercise behavior; however, perceived parental autonomy support was significantly related to adolescent self-
determination. Hagger et al., 2007 examined the relationship of parental, peer, and teacher autonomy support on exercise behavior internalization in a sample of middle adolescents. The researchers reported that all three domains of autonomy support were significant in the internalization of exercise behavior; however, peer autonomy support was the most influential. The findings of the current study suggest that the influence of parental autonomy support on adolescent motivation for specific health behaviors may diminish as the adolescent advances down the developmental continuum toward independence. Since parental autonomy support does not appear to influence diet and exercise behaviors in the older adolescent, health promotion implications of the current study are related to the importance of available nutritional knowledge and exercise opportunities of students residing away from the parental residence. Future research targeting older adolescents might consider the heightened importance of peer relationships and the emphasis on identity formation in the social context that occurs during late adolescence (Douthitt, 1994; Kroger, 2007; Powers, et al., 2008) when designing studies to examine adolescent motivation for diet and exercise behaviors. Examination of peer autonomy support in relation to motivation for diet and exercise behaviors may provide further knowledge in older adolescents. Hagger et al. (2007) developed and replicated a measure to assess teacher, parent, and peer autonomy support in middle adolescents; however, the scale has not been validated in an older adolescent population. In addition, the inclusion of the two remaining psychological needs (competence and relatedness) may also provide a more complete representation of motivation for diet and exercise behaviors in the older adolescent.

Parental autonomy support predicted adolescent self-determination, and thus provided validation of the continued, significant role of parental autonomy support in
older adolescent development. Increased adolescent self-determination has been linked to improved psychological functioning (Soenens et al., 2007, enhanced adolescent self-regulation (Hagger et al., 2007), as well as to numerous academic outcomes (Niemiec et al., 2005; Ratelle et al., 2005; Soenens & Vansteenkiste, 2005; Vansteenkiste et al., 2005). A family environment that is autonomy supportive will promote satisfaction of the adolescent’s basic psychological needs, which will increase adolescent self-determination. While other adolescent self-determination antecedents should be explored, future research should continue to consider parental influence as a possible precursor to adolescent self-determination. In addition, family education should provide information and guidance to parents regarding their role in shaping their adolescent’s attitudes and beliefs.

Adolescent self-determination was significant in the prediction of adolescent motivation for diet, but not exercise, and suggested that healthy dietary behaviors are more internalized in the older adolescent than are exercise behaviors. In addition, females exhibited greater motivation for diet behaviors than did males; a finding that is consistent throughout the literature (Backman et al., 2002; Dennison & Shepherd, 1995; Davy et al., 2006; Jackson et al., 2009). Further exploration regarding the internalization of health behaviors for both female and male adolescents is warranted to better understand this phenomenon. Further research should explore both intrinsic and extrinsic influences on motivation for diet and exercise behaviors across gender lines.

Overall, mothers were viewed as more autonomy supportive than fathers in this sample. While neither parental autonomy support construct was predictive of adolescent motivation for diet and exercise behaviors, both MAS and PAS were predictive of adolescent self-determination; MAS exhibited the greatest influence. Evidence clearly
exists that while mothers may be viewed as more autonomy supportive, both mothers and fathers are influential in adolescent development. Health care providers should include both parental figures, when possible, when designing treatment plans and/or outcome goals for adolescents.

The measures (MASS and PASS, SDS, ARSS for diet and exercise) utilized in this study yielded sufficient variance and demonstrated adequate internal reliability (Cohen, 1988); however, the exclusion of control led motivation and amotivation in the assessment of AMD and AME may have affected the ability to find a relationship between adolescent self-determination and AME. Future research might incorporate these less autonomous forms of behavior regulation into the study design to assess a more complete representation of adolescent motivation for a specific behavior. In addition, the SDS provided a global perception on the autonomous regulation of the adolescent. Inclusion of a scale designed to assess all forms of motivation (intrinsic, integrated, introjected, and extrinsic), such as the Perceived Locus of Causality Scale (Ryan and Connell, 1989) may provide greater understanding of adolescent motivation regarding a specific behavior.

Limitations of the Study Findings

There are some major limitations of the current study. The lack of measurement of behavior-specific perceived parental autonomy support may have prohibited a true assessment of the relationship between parental autonomy support and AMD and AME. Individuals strive to fulfill the three psychological needs: autonomy, relatedness, and competence (Deci & Ryan, 2000a). Exclusion of competence and relatedness from the conceptual model may have restricted the understanding of the motivation of the older
adolescent’s diet and exercise behaviors. Perceptions of MAS and PAS were obtained only from the adolescent perspective. A previous study (Purdie et al., 2004) found that adolescent and parent perceptions of parental autonomy support were incongruent. Examination of how parents view themselves may contribute to the growing body of knowledge regarding adolescent motivation and behavior. The present study examined motivation for diet and exercise behavior; assessment of dietary intake or exercise frequency was not assessed. Generalization was restricted due to the convenience sample of college students, use of a single data collection site, unequal gender representation, and disproportionate African-American representation. The cross-sectional, correlational study design also limited generalizability of the present study; examination of causality and true understanding of age-related changes cannot be determined. While the sample size ($n = 132$) yielded sufficient power for the current study, the sample size was not sufficient to conduct post-hoc analyses (Cohen, 1988). The combination multiple family structures in the operationalization of this variable may have led to inflated significance of the non 2-parent biological family structures.

Conclusions

The purpose of this study was to investigate the influence of parental autonomy support on AMD and AME and to assess the mediation role of self-determination between these variables. Four hypotheses were formulated to achieve the study purpose. Based on the results of this study, the following conclusions were drawn:

1. Older adolescent females are more intrinsically motivated for a healthy diet than adolescent males.
2. The role of family structure in adolescent motivation for health behaviors is unclear. In contrast to prior studies, adolescents from 2-parent biological families were less likely to be motivated for a healthy diet.

3. An increase in motivation for healthy dietary behaviors occurs as the adolescent nears adulthood.

4. The adolescents’ general perception of mothers’ and fathers’ autonomy support is not related to the motivation of specific health behaviors of diet and exercise in older adolescents attending college.

5. Adolescent perceptions that mothers and fathers are autonomy supportive are key predictors of the adolescent’s self-determination.


7. The MAS and PAS scales, the SDS, and the ARSS Scale are reliable measures that are appropriately used with older adolescents.

8. The SDT framework is a useful framework that is appropriate for examining motivational constructs in the adolescent population. The SDT framework should be applied to develop an understanding of the contribution of peer and significant others support to adolescent motivation and exercise.

**Recommendations**

The following recommendations are based on the findings of this study.

Ninety percent of adolescents from wealthier families attend some form of post-secondary education following high school in comparison to only 60% of adolescents from poorer socioeconomic families (Udry, 2001). In essence, 40% of less
socioeconomically disadvantaged adolescents attend college. Significant differences may lie in motivation, health behaviors, and perceptions between adolescents who attend college and those who do not. Generalization of findings could be enhanced by recruitment of adolescents from non-educational sites.

According to SDT, competence and relatedness are also basic psychological needs of all individuals. Incorporation of competence and relatedness into the conceptual model and assessing their impact on adolescent motivation for health behaviors may provide a clearer understanding of the adolescent motivation construct; therefore, future research should consider the incorporation of all three psychological needs into the study design.

Further investigation of the causal relationship of parental autonomy support with adolescent self-determination as well as the causal relationship of adolescent self-determination with adolescent motivation for diet should be employed by incorporating a longitudinal design. In addition, exploration of other determinants of adolescent motivation for their diet and exercise behaviors may be useful in developing effective interventions to promote health diet and exercise among older adolescents in the future.
REFERENCES


Guay, F., & Chana, J. (2008). Meet the parents: Mothers and fathers’ contextual and psychological resources associated to adolescents’ perceptions of parental autonomy support. In H. W. Marsh, R. G. Craven, & D. M. McInerney (Eds.),


APPENDIX A

INTEGRATIVE REVIEW TABLES A1-A6
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Sample</th>
<th>Conceptual Framework and Design</th>
<th>Purpose</th>
<th>Findings</th>
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</table>
| Chirkov & Ryan (2001)           | 236 high school students in the United States or Russia who were 16-19 years of age | SDT; cross-sectional, cross-cultural, correlational design | Examine the effect of parental autonomy support and teacher autonomy support on academic motivation and self-regulation. | 1. Parental autonomy support and teacher autonomy support were negatively related to external regulation ($\beta = -.26, p < 0.05$), had no relationship to introjected regulation, and were positively related to identification regulation ($\beta = .47, p < 0.01$) and intrinsic motivation ($\beta = -.48, p < .01$).  
2. Autonomy support predicted greater well-being ($\beta = .39, p < .05$).  
3. Structural equation modeling paths indicated that teacher autonomy support and parental autonomy support were positively related to academic regulation ($p < .05$); however, TAS displayed a stronger relationship. |
| Vallerand, Fortier, & Guay (1997) | 4,537 French-Canadian youth from grades 9 through 10 ($M$ age = 14.97 years) | SDT; prospective, correlational design | Examine the role of social agents (teachers, parents, and school administrators) in students’ perceptions of competence and autonomy. | 1. When the adolescents perceived parents as less autonomy supportive, they were less competent ($\beta = .51, p < .05$) and less autonomously motivated for academics ($\beta = .41, p < .05$).  
2. When students felt less competent ($\beta = .32, p < .05$) and autonomous ($\beta = .65, p < .05$), they exhibited lower school motivation.  
3. When students had low levels of self-determined motivation ($\beta = -.67, p < .05$) they were more likely to intend to withdraw from school and eventually drop out of school ($\beta = .24, p < .05$). |
| Niemiec, Lynch, Vansteenkiste, Bernstein, Deci, & Ryan (2005) | Study 1: 231 high school juniors and seniors ($M$ age = 17 years)  
89% of sample lived with both parents.  
103 males and 137 females  
Study 2: 202 Belgian technical high school seniors ($M$ age = 19 years).  
140 males and 62 females | Studies 1 and 2: SDT; cross-sectional, correlational design | Study 1: Examine the relationship among perceived need support from parents, adolescents’ autonomous self-regulation for academics, and adolescents’ well-being.  
Study 2: Examine whether the relationship between adolescents’ perceived need support from parents and adolescents’ psychological health would be mediated by autonomous self-regulation. | Study 1:  
1. Perceived need support from parents (mothers $\beta = .47, p < .01$; fathers $\beta = .30, p < .01$) independently predicted adolescents’ well-being. Mothers’ perceived need support was more significant than fathers’ perceived need support ($z = 2.76, p < .01$).  
Study 2:  
1. Autonomous self-regulation for planning to attend college was a significant partial mediator of the relationship between adolescents’ perceived need support and well being ($z = 1.46, p < .05$). |
Table A1 (continued)

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<th>Author(s)</th>
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<th>Conceptual Framework and Design</th>
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<tr>
<td>Ratelle, Larose, Guay, &amp; Senecal (2005)</td>
<td>729 French-speaking high school seniors in Quebec (M age = 17 years)</td>
<td>SDT; longitudinal, correlational design</td>
<td>Examine the role of parental autonomy support in persistence in science curriculum.</td>
<td>1. Parental autonomy support was significantly correlated with scientific competence ($R^2 = .32, p &lt; .001$), high school science achievement ($R^2 = .20, p &lt; .01$) and self-determination in the program ($R^2 = .23, p &lt; .001$). Perceived parental autonomy support predicted scientific persistence. 2. Perceptions of parental autonomy support were positively associated with feelings of competence ($\beta = .16, p &lt; .05$), and autonomy ($\beta = .18, p &lt; .05$) whereas perceived parental involvement was positively related to relatedness ($\beta = .31, p &lt; .05$). 3. Competence and autonomy partially mediated the relationship between the students’ perceptions of PAS and students’ persistence in a science program.</td>
</tr>
<tr>
<td>Vansteenkiste, Zhou, Lens, &amp; Soenens (2005)</td>
<td>Study 1: 150 Chinese students learning English (M age = 23.8 years)</td>
<td>SDT; cross-sectional, cross-cultural correlational design</td>
<td>Study 1: Examine autonomous study motivation effects.</td>
<td>Study 1: 1. Increased autonomous motivation for studying predicted adaptive learning attitudes ($\beta = .29, p &lt; .01$), academic success ($\beta = .21, p &lt; .05$), and personal well-being ($\beta = .19, p &lt; .05$).</td>
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<td>Study 2: 77 Chinese Belgium immigrants (M age = 22.8 years)</td>
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<td>Study 2: Examine the role of parental autonomy support in learning strategies and well-being.</td>
<td>Study 2: 1. Parental autonomy support was related to greater adaptive learning strategies ($\beta = .34, p &lt; .01$); these effects were mediated by student’s relative autonomy for studying.</td>
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<tr>
<td>Soenens &amp; Vansteenkiste (2005)</td>
<td>Study 1: 328 adolescents from a Dutch-speaking part of Belgium (M age = 17 years)</td>
<td>SDT; cross-sectional, correlational design</td>
<td>Study 1: Examine parental autonomy support and its relationship with self-determination in both the school and peer domains.</td>
<td>Study 1: 1. Parental autonomy support was related to self-determination in school ($\beta = .24, p &lt; .01$) and social ($\beta = .23, p &lt; .01$) domains. 2. Self-determination partially mediated the effect of parental autonomy support on grade point average ($\beta = .27, p &lt; .01$) and on scholastic competence ($\beta = .47, p &lt; .001$).</td>
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<td>Author(s)</td>
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| Study 2: 279 adolescents from 3 secondary schools from a Dutch-speaking part of Belgium (\(M_{\text{age}} = 18.71\) years) | Study 2: Cross-sectional, correlational design | Study 2: Cross-validate Study 1, and extend the study of self-determination into another life domain (job). | Study 2: 1. Both maternal (\(R^2 = .13, p < .05\)) and paternal (\(R^2 = .13, p < .05\)) autonomy support were positively associated with school grades. 2. Autonomy support by both fathers (\(\beta = .26, p < .01\)) and mothers (\(\beta = .27, p < .01\)) was positively related to self-determination, both in the domain of school and in the domain of job (\(\beta = .25, p < .01\)). | *Note. SDT = self-determination theory*
### Parental Autonomy Support and Non-Academic Self-Regulation

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<tr>
<td>Hagger et al. (2007)</td>
<td>Study 1: 432 high school students from Great Britain ($M_{age} = 13.95$ years)</td>
<td>Study 1: SDT; cross-sectional study design</td>
<td>Study 1: Develop a perceived-autonomy-support scale for exercise settings in young people.</td>
<td>Study 1: 1. Perceived locus of causality was significantly related to: a. External regulation ($r = -.027, p &gt; .05$) b. Introjected regulation ($r = -.014, p &gt; .05$) c. Identified regulation ($r = .334, p &lt; .01$) d. Intrinsic regulation ($r = .296, p &lt; .01$)</td>
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<td>220 males and 212 females</td>
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<td>Study 2: 712 Eastern and Western high school students ($M_{age} = 15.04$ years)</td>
<td>Study 2: Cross-sectional, cross-cultural design</td>
<td>Study 2: Assess the replicability of the measure of perceived autonomy support for the three most influential figures (teachers, parents, and peers) across cultures.</td>
<td>Study 2: 1. Scale was validated in three cultures. Goodness of fit for single-sample confirmatory factor analyses of the perceived-autonomy-support scale for exercise settings for parents was as follows: a. British-SB-$\chi^2 = 90.806, p &lt; .01$ b. Estonian-SB-$\chi^2 = 64.042, p &lt; .01$ c. Hungarian-SB-$\chi^2 = 89.888, p &lt; .01$</td>
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<td>210 British</td>
<td>268 Estonian</td>
<td>235 Hungarian</td>
<td>324 males and 388 females</td>
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<td>3. Goodness-of fit for single-sample confirmatory factor analyses of the perceived autonomy support scale for exercise settings for teachers was as follows: a. British-SB-$\chi^2 = 120.266, p &lt; .01$ b. Estonian-SB-$\chi^2 = 93.251, p &lt; .01$ c. Hungarian-SB-$\chi^2 = 98.592, p &lt; .01$</td>
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<td>4. Findings also suggested that autonomy support was rated higher by students from individualistic culture (British and Hungarian) that by those from collectivist cultures (Estonian).</td>
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<td>Author(s)</td>
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| Gagne (2003) | 119 undergraduate college students | SDT, cross-sectional design | Examine the impact of autonomy orientation and autonomy support on engagement in prosocial behavior. | 1. Parental autonomy support was correlated with the student’s autonomy orientation \( (r = .23, p < .01) \), and marginally correlated with the student’s prosocial engagement \( (r = .16, p < .10) \).  
2. Parental autonomy support \( (R^2 = .40, p < .01) \) and student autonomous orientation \( (R^2 = .43, p < .01) \) predicted general needs satisfaction, and general needs satisfaction predicted student prosocial engagement \( (R^2 = .26, p < .05) \). |
| Purdie, Carroll, & Roche (2004) | 214 Australian high school students \( (M\text{ age} = 14\text{ years}) \) and their parents | No conceptual framework; cross-sectional, correlational design | Examine differences between adolescents’ and their parents’ perceptions of parenting behaviors. Examine the relationship between adolescents’ academic and nonacademic self-regulation, authoritative parenting (involvement, strictness, and autonomy granting), and parent self-efficacy. | 1. Parent and teens differed in their perceptions of parenting behaviors \( (t = 4.05, p < .001; t = 6.27, p < .001; t = 12.93, p < .001) \) with parents rating themselves higher in all categories.  
2. A strong path was found between parent self-efficacy and adolescents’ academic \( (\beta = .18, p < .01) \) and non-academic self-regulation \( (\beta = .90, p < .01) \) via high parental involvement \( (\beta = .38, p < .01) \).  
3. Strict parenting and autonomy granting were not significant in the development of young people’s self-regulatory behaviors. |
| Roth (2008) | 133 undergraduate college students \( (M\text{ age} = 23.4\text{ years}) \) | SDT; cross-sectional, correlational design | Examine the relationships among parental autonomy support and identified/integrated internalization and other-oriented helping. | 1. Maternal \( (\beta = .38, p < .01) \) and paternal \( (\beta = .39, p < .01) \) autonomy support was positively associated with other-oriented helping.  
2. The path from autonomy support to other-oriented helping went through identified/integrated internalization for both mothers \( (\beta = .21, p < .05) \) and fathers \( (\beta = .33, p < .01) \).  
3. Controlling for identified/integrated internalization resulted in a reduction in direct association between autonomy support and other-oriented helping \( (\text{mothers-} \beta = .19, p < .10; \text{fathers-} \beta = .20, p < .05) \). |

*Note. SDT = self-determination theory*
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| Suldo & Huebner (2004) | 1,188 early, mid, and late adolescents (M age = 14.6 years)            | No conceptual framework; cross-sectional, correlational design | Examine adolescent life satisfaction as a mediator between authoritative parenting dimensions and adolescent problem behavior. Evaluate adolescent life satisfaction as a mediator between authoritative parenting and adolescent internalizing and externalizing behavior. | 1. Psychological autonomy granting was significant in the prediction of adolescent life satisfaction in early (r = .16, p < .01), middle (r = .14, p < .01) and late adolescence (r = .17, p < .01) and remained constant across all age groups.  
2. Parental social support exhibited the strongest correlation with adolescent life satisfaction (β = .45, p < .01).  
3. The relationship between parental social support and adolescent life satisfaction demonstrated a significant interaction (t = -4.21, p < .001). The influence of parental social support on adolescent life satisfaction decreased as the adolescent aged.  
4. Associations between parenting behaviors and adolescents’ life satisfaction decreased as the teens matured (t = -.41, p < .001).  
5. Adolescent life satisfaction partially mediated problem behaviors in adolescence. |
| Abad & Sheldon (2008)  | 98 college-aged second-generation immigrants raised in the United States | SDT; cross-sectional, correlational design | Examine the role of parental autonomy support and acculturation among second generation immigrants | 1. No difference between paternal and maternal autonomy support was found (t = .91, p > 0.4).  
2. Paternal autonomy support significantly predicted ethnic society immersion (β = .37, p < .05), natal culture immersion (β = .30, p < .01), happiness (β = .41, p < .05), and life satisfaction (β = .30, p < .05) whereas maternal autonomy support did not do so. |
| Downie et al. (2007)  | Study 1: 105 multicultural persons living in Canada (M age = 20.2 years) | Study 1: SDT; cross-sectional/cross-cultural, and longitudinal study | Examine the relationship of PAS to the cultural internalization and well-being of multicultural students. | Study 1:  
1. Parental autonomy support was significantly and positively associated with heritage cultural internalization (r = .33, p < .001) and well-being (r = 0.33, p < .01).  
2. Paternal autonomy support was more strongly correlated with heritage internalization (r = .34, p < .01) than maternal autonomy support (r = .27, p < .01) was found to be. |
Table A3 (Continued)

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<th>Author(s)</th>
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<th>Conceptual Framework and Design</th>
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<tr>
<td>Study 2: 125 Chinese-Malaysian sojourners ((M_{\text{age}} = 20.8 \text{ years})).</td>
<td>Cross-sectional/cross-cultural, longitudinal study</td>
<td>Study 2: Replicate the findings of Study 1 to autonomy support, cultural internalization, and well-being in a sample of individuals who began with a common culture but who had migrated toward Western host cultures.</td>
<td>1. Parental autonomy support was related to both heritage culture internalization ((\beta = .29, p &lt; .001)) and well-being ((\beta = .28, p &lt; .01)).</td>
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<tr>
<td>Wang, Pomerantz, &amp; Chen (2007)</td>
<td>373 American and 433 Chinese 7th graders ((M_{\text{age}} = 12.73 \text{ years}))</td>
<td>SDT; cross-sectional/cross-cultural longitudinal study</td>
<td>Compare parental control and autonomy support in two different cultures.</td>
<td>1. No cultural differences were noted between Chinese and American students’ perceptions of autonomy support. 2. Parents’ psychological autonomy support predicted children’s enhanced goal investment ((\beta = .23, p &lt; .001)), emotional functioning ((\beta = .13, p &lt; .01)) and academic functioning ((\beta = .14, p &lt; .001)) and was significant for both American and Chinese students: a. American- enhanced goal investment- (\beta = .23, p &lt; .001); emotional functioning- (\beta = .29, p &lt; .001); academic functioning- (\beta = .22, p &lt; .001) b. Chinese- enhanced goal investment (\beta = .12, p &lt; .05); emotional functioning (\beta = .19, p &lt; .01); academic functioning (\beta = .11, p &lt; .05).</td>
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<tr>
<td>Robbins, 1994</td>
<td>177 undergraduate students: 68 males and 109 females</td>
<td>Self-determination theory; cross-sectional, correlational design</td>
<td>Examine influence of perceived parental autonomy support and impact on student self-esteem, self-actualization, autonomy causality orientation, and academic self-regulation</td>
<td>1. Mother and father ratings of autonomy support were positively related ((r = .51, p &lt; .01)), but mothers were perceived as more autonomy supportive than fathers ((t = 4.60, p &lt; .0001)). 2. Adolescent report of parental autonomy support was positively related to student self-esteem ((F = 6.80, p &lt; .01)), self-actualization ((F = 4.11, p &lt; .01)), vitality ((F = 10.80, p &lt; .001)), and autonomy causality orientation ((F = 18.99, p &lt; .001)). 3. Adolescent perceptions of parental autonomy support were significantly related to father’s global self-esteem ((F = 6.64, p &lt; .01)).</td>
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### Table A3 (continued)

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<tbody>
<tr>
<td>Soenens, Vansteenkiste, Lens et al. (2007)</td>
<td>Study 1: 396 first-year psychology students ($M_{age} = 18.9$ years)</td>
<td>Study 1: SDT; cross-sectional, correlational design</td>
<td>Study 1: Examine the effect of promotion of volitional functioning on adolescent psychosocial functioning (global self-worth, depressive feelings, and social well-being).</td>
<td>Study 1: 1. Parental volitional functioning ($\beta = .71, p &lt; .001$), which was predictive of adolescent psychological functioning ($\beta = .78, p &lt; .001$).</td>
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<td>Study 2: 495 undergraduate education and law students ($M_{age} = 19.3$ years)</td>
<td>Study 2: Cross-sectional, correlational design</td>
<td>Study 2: Examine mediating effect of self-determination on outcome variables</td>
<td>Study 2: 1. No significant differences were found between two models: (a) full-mediation model, in PVF was only indirectly related to adolescent psychological functioning through self-determination and (b) a partial-mediation model in which PVF additionally predicted adolescent psychological functioning over and above the direct path ($\Delta \chi^2 = 2.71; p &gt; .05$). 2. These findings indicted that the direct effect of PVF on adolescent psychosocial functioning is accounted for by the effect of self-determination. 3. PVF predicted higher levels of self-determination ($\beta = .58, p &lt; .001$), which, in turn, related positively to adolescent psychosocial functioning ($\beta = .34, p &lt; .001$).</td>
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*Note. PVF = promotion of volitional functioning; SDT = self-determination theory*
### Table A4

**Self-Determination and Autonomy**

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<tr>
<td>Black &amp; Deci (2000)</td>
<td>289 undergraduates at eastern university who were taking an introductory organic chemistry course</td>
<td>SDT; prospective, cross-sectional design</td>
<td>Evaluate the impact of autonomous motivation and autonomy-supportive instructors on perceived competence and enjoyment for chemistry. Evaluate the impact of autonomy-supportive climate on the student’s autonomous motivation and the impact of the autonomous motivation on class performance and persistence.</td>
<td>1. Students who enrolled in the course for autonomous reasons had higher perceived competence ($r = .39, p &lt; .001$), enhanced interest ($r = .45, p &lt; .001$), decreased anxiety ($r = .29, p &lt; .001$) and demonstrated grade-focused performance goals ($r = .25, p &lt; .01$).&lt;br&gt;2. Autonomy supportive perceptions of instructors by the students predicted increased competence ($\beta = .54, p &lt; .001$), increased enjoyment ($\beta = .40, p &lt; .001$), and decreased anxiety ($\beta = .37, p &lt; .001$).&lt;br&gt;2. Students with lower autonomous motives for staying in the course were more likely to drop out ($F = 4.15, p &lt; .05$).</td>
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<td>Edmunds, Ntoumanis, &amp; Duda (2007)</td>
<td>56 female undergraduate college students ($M$ age = 21.26 years).</td>
<td>Self-Determination Theory; Quasi-experimental, cross-sectional design</td>
<td>Examine the effect of an autonomy supportive teaching style on exercise class participants, psychological-needs satisfaction, motivation, exercise behavior, exercise behavioral intention, and affect.</td>
<td>1. The intervention group reported a significantly greater linear increase in autonomy support ($\beta = .30, p &lt; .05$), structure ($\beta = .49, p &lt; .05$), interpersonal involvement ($\beta = .36, p &lt; .05$), relatedness ($\beta = .50, p &lt; .05$), competence ($\beta = .66, p &lt; .01$), and positive affect ($\beta = .25, p &lt; .01$).&lt;br&gt;2. Integrated regulation ($\beta = .30, p &lt; .05$) was a positive predictor of positive affect.&lt;br&gt;3. Attendance rates were significantly different ($t = -2.04, p &lt; .05$) between groups. Attendance was higher in the SDT group.&lt;br&gt;4. SDT-based social-contextual characteristics and psychological needs predicted autonomous regulation in the intervention group.</td>
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| Vansteenkiste, Simons, Lens, Sheldon, & Deci (2004) | **Study 1:** 200 first-year female Belgian college students majoring in early education (19-20 years of age) | Studies 1–3: SDT; quasi-experimental, cross-sectional design | **Studies 1, 2, and 3:** Examine the effect of providing rationale for learning and a learning opportunity in a supportive versus a controlling manner. | **Study 1:**
1. Providing an intrinsic rationale for learning and providing the rationale in an autonomy-supportive manner resulted in more autonomous motivation for learning, decreased superficial processing, and increased deep processing, as well as in improved test performance and persistence ($p < .001$ for all).
2. Intrinsic goals and autonomy support were significantly mediated by autonomous motivation ($F = 25.92, p < .001$), enhanced processing of information ($F = 5.54, p < .001$), and better performance ($F = 7.12, p < .001$), but not by persistence.
3. Intrinsic goal framing and autonomy-supportive contexts each resulted in more autonomous motivation, less superficial processing, better graded performances, and more persistence ($p < .001$ for all).

**Study 2:**
1. Intrinsic goal content and autonomy-supportive learning contexts worked synergistically to produce a positive effect on use of deep processing strategies ($F = 20.95, p < .001$) and test performance ($F = 8.99, p < .001$) and a negative effect on superficial processing ($F = 33.19, p < .001$).

**Study 3:**
1. Autonomy support and intrinsic goals interacted to produce an additional positive effect on adolescents’ autonomous motivation ($F = 26.99, p < .001$) and graded performance ($F = 4.10, p < .001$).

**Study 2:**
Evaluate motives for learning, learning level and process, and persistence.

**Study 3:**
Autonomy support and intrinsic goals interacted to produce an additional positive effect on adolescents’ autonomous motivation ($F = 26.99, p < .001$) and graded performance ($F = 4.10, p < .001$).

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| Williams, Cox, Kouides, & Deci (1999) | **Study 2:** 181 female and 196 male marketing students (18-19 yrs of age) | | **Evaluate motives for learning, learning level and process, and persistence.** | **Study 2:**
1. Students significantly perceived greater autonomy support in the “It’s Your Choice” presentation ($p = .04, p < .001$).
2. Perceived autonomy support of the presentation was not significant ($F = 3.32, p = .07$), and did not significantly increase the students’ autonomous motivation not to smoke ($F = 0.11, p = .74$).

**Study 3:**
400 9th-12th graders at two suburban high schools ($M$ age = 16.1 years).
Age not provided

176 males and 224 females

SDT; quasi-experimental longitudinal design

Examine the impact of providing information in an autonomy supportive style to teens about smoking.
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| Reeve, Jang, Hardre, & Omura (2002)            | 141 undergraduate college students from an introductory educational psychology course at a Midwestern university | SDT; experimental design                 | Examine the impact of providing rationale for a monotonous task in an autonomy-supportive manner on the personal identification regarding the task, and the effort exhibited performing the task.                                                                 | 1. Persons who received an identified rationale for the task scored higher on perceived importance of the task ($t = 2.30, p < .05$); perceived self-determination ($t = 2.69, p < .05$); and effort ($t = 2.61, p < .05$).  
2. Providing a rationale for the task significantly impacted perceived importance of the task ($F = 3.56, p < .05$) and self-determination ($F = 4.47, p < .01$).  
3. Extent of effort of the task positively correlated with extent of enjoyment ($r = .60, p < .01$).  
4. A rationale of the task exhibited a marginal positive effect on effort ($F = 2.53, p = .06$).                                                                                                                                 |
| Hagger, Chatzisarantis, Culverhouse, & Biddle (2003) | 295 students from three states who were 13-16 years-of-age.  
132 males and 163 females | SDT and Theory of Planned Behavior; quasi-experimental design | Examine the processes by which perceived autonomy support in physical education promotes physical activity intentions | 1. Perceived autonomy support total effects were significantly related to physical activity behavior ($r = .235, p < .01$).  
2. Intrinsic motivation in exercise directly impacted exercise intentions ($r = .231, p < .05$). In addition, exercise intentions were positively correlated to attitudes ($r = .588$), perceived control ($r = .391$), identified ($r = .240$) motivation and intrinsic ($r = .263$) motivation in physical exercise, and identified ($r = .475$) and intrinsic ($r = .393$) motivation in leisure time (all at $p < .01$).  
3. The effect of perceived autonomy support on physical activity behavior was partially mediated by the internal perceived locus of causality in physical education and leisure-time contexts and by perceived behavioral control and intentions. |

3. Adolescent perceptions of autonomy support significantly predicted reduction in smoking at 4 months ($F = 4.09, p = .04$). Autonomous motives for not smoking significantly predicted reduction in smoking over 4 months ($F = 7.64, p = .006$).
Table A4 (Continued)

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Sample</th>
<th>Conceptual Framework and Design</th>
<th>Purpose</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shahar, Henrich, Blatt, Ryan &amp; Little (2003)</td>
<td>860 seventh-to ninth-grade students</td>
<td>SDT; quasi-experimental prospective design</td>
<td>Examine the mediating effects of motivational orientation between interpersonal relatedness and self-definition on life events in adolescents.</td>
<td>1. Self-criticism predicted more negative life events ($\beta = .25, p &lt; .01$) and less autonomous motivation ($\beta = -.62, p &lt; .01$). Efficacy predicted more positive life events ($\beta = .12, p &lt; .01$) and more autonomous motivation ($\beta = .27, p &lt; .01$). 2. Autonomous motivation predicted more positive life events ($\beta = .55, p &lt; .01$) and completely mediated the effects of self-criticism and efficacy on positive life events.</td>
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*Note. SDT = self-determination theory.*
**Table A5**

**Self-Determination and Motivation**

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<tr>
<th>Author(s)</th>
<th>Sample</th>
<th>Conceptual Framework and Design</th>
<th>Purpose</th>
<th>Findings</th>
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</thead>
<tbody>
<tr>
<td>Miquelon &amp; Vallerand (2008)</td>
<td>Study 1: 308 undergraduate college students</td>
<td>Studies 1-3: SDT; quasi-experimental, two-way prospective design</td>
<td>Study 1: Examine motives associated with the goals that an individual pursues and the relationship of those goals to personal well-being (defined as happiness and self-realization).</td>
<td>Study 1: Pursuing autonomous goals enhanced happiness ($\beta = .26, p &lt; .001$) and self-realization ($\beta = .20, p &lt; .001$). Pursuing control-related goals was negatively related to self-realization ($\beta = -.24, p &lt; .001$). Self-realization was negatively linked to physical symptoms ($\beta = -.25, p &lt; .001$), but happiness was not significantly related to physical symptoms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gender distribution not provided</td>
<td>Study 2: Examine why self-realization (but not happiness) was found to be negatively linked to physical symptoms. Evaluated whether well-being is predictive of changes in physical symptoms.</td>
<td>Study 2: Reported self-realization was predictive of positive coping strategies ($\beta = .20, p &lt; .001$), and enhanced coping strategies were predictive of fewer physical symptoms ($\beta = .20, p &lt; .001$). Happiness was not significantly related to positive coping strategies. Thus, fewer physical symptoms promoted physical health via less avoidant coping strategies.</td>
</tr>
<tr>
<td></td>
<td>Study 2: 158 undergraduate students</td>
<td></td>
<td>Study 3: Further understand why self-realization and happiness were found to be differentially related to stress.</td>
<td>Study 3: This study replicated findings of Studies 1 and 2. Self-realization but not happiness was positively associated with vigilant academic coping ($\beta = .20, p &lt; .001$) and negatively associated with avoidant academic coping ($\beta = -.21, p &lt; .001$). In addition, vigilant academic coping was negatively associated with academic stress ($\beta = .20, p &lt; .01$), whereas avoidant academic coping was positively related to academic stress ($\beta = .33, p &lt; .001$). Furthermore, academic stress was negatively associated with students’ self-rated health ($\beta = -.27, p &lt; .001$).</td>
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<tr>
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<td>Study 3: 240 undergraduate students</td>
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<tr>
<td>Hagger, Chatzisarantis, &amp; Harris (2006a)</td>
<td>511 undergraduate and graduate students ($M$ age = 24.93 years)</td>
<td>SDT; three-wave prospective design</td>
<td>Examine the influence of global-level psychological-needs satisfaction on contextual autonomous motivation.</td>
<td>1. Autonomous motives influenced attitude ($\beta = .314, p &lt; .01$) and perceived behavioral control ($\beta = .368, p &lt; .01$).</td>
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Table A5 (Continued)

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<tr>
<td>Cresswell &amp; Eklund (2005)</td>
<td>102 professional, male rugby players from New Zealand (M age = 24.75 years)</td>
<td>SDT; quasi-experimental, prospective design</td>
<td>Examine changes in athlete burnout and source or type of motivation.</td>
<td>2. Psychological-needs satisfaction was significantly influenced by attitude (β = .203, p &lt; .01) and perceived behavioral control (β = .168, p &lt; .05). Autonomous motives partially mediated the effects of psychological-needs on satisfaction attitude and on perceived behavioral control. 3. Attitudes (β = .264, p &lt; .01) and perceived behavioral control (β = .503, p &lt; .01) at the situational level significantly predicted behavioral intentions. Direct influence of autonomous motives on intention (β = .261, p &lt; .01) was partially mediated by attitude and perceived behavioral control. 4. Overall effects of the distal global- and contextual-level constructs were as follows: Significant total effects of psychological-needs satisfaction on intention (total effect = .210, p &lt; .01) and behavior (total effect = .153, p &lt; .05) were demonstrated.</td>
</tr>
<tr>
<td>Chatzisarantis, Hagger, Biddle, &amp; Karageorghis (2002)</td>
<td>168 youths from three states (M age = 13.53 years) 85 males and 83 females</td>
<td>Theory of Planned Behavior; quasi-experimental cross-sectional design</td>
<td>Examine relationship between PLOC and attitude toward physical activity and between PLOC and perceived behavioral control.</td>
<td>1. Reduced accomplishment was associated with amotivation: (r = .45, p &lt; .05); amotivation had a strong positive relationship with burnout. 2. Players reported that sport devaluation was significantly related to their level of amotivation (r = .52, p &lt; .05). 3. Players who reported high intrinsic motivation reported low levels of sport devaluation (r = -.28, p &lt; .05).</td>
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<td>Conceptual Framework and Design</td>
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<tr>
<td>Houlfort, Koestner, Joussemet, Nantel-Vivier, &amp; Lekes (2002)</td>
<td>Study 1: 85 undergraduate college students ((M\text{ age} = 19.3\text{ years})) 17 males and 68 females</td>
<td>Studies 1 and 2: SDT and the Theory of Planned Behavior; quasi-experimental cross-sectional design</td>
<td>Study 1: Examine the impact of performance-contingent rewards on perceived autonomy, competence, and intrinsic motivation.</td>
<td>Study 1: 1. Perceived competence was correlated to affective autonomy ((r = .26, p &lt; .05)), but unrelated to decisional autonomy ((r = .14, p &gt; .10)). 2. Perceived competence and decisional autonomy were correlated with self-reported interest ((r = .32, p &lt; .01; r = .23, p &lt; .05)), but only perceived competence was related to free-choice activity. 3. An undermining effect of performance-contingent reward on affective reports of autonomy ((F = 4.07, p &lt; .05)) indicated that participants rewarded for their good performance reported significantly less affective autonomy than participants in the no-reward condition reported. In addition, performance-contingent rewards had a marginal effect on perceived competence ((F = 3.07, p = .08)). 4. Performance-contingent rewards had a detrimental impact on affective autonomy; they had no impact on participants’ self-reported interest or free-choice activity.</td>
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<td></td>
<td>Study 2: 145 children (third-sixth grades) 65 males and 80 females</td>
<td>Study 2: Replicate the findings of Study 1 with elementary-aged children.</td>
<td></td>
<td>Study 2: 1. Perceived competence was positively correlated with affective autonomy and self-reported interest ((r = .23, p &lt; .01; r = .17, p &lt; .05)). Affective autonomy was not related to self-reported interest ((r = .05, p &gt; .05)). 2. Findings revealed a significant Reward x Type of Need interaction ((F = 7.23, p &lt; .01)). Children in the performance-contingent reward condition reported relatively lower affective autonomy but higher perceived competence. Children in the no-reward condition reported relatively higher affective autonomy but diminished perceived competence. 3. Significant gender interaction was also noted ((F = 5.90, p &lt; .05)) and indicated that performance-contingent rewards produced a greater negative impact on girls’ reports of affective autonomy than on boys.</td>
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*Note. PLOC = perceived locus of control; SDT = self-determination theory.*
**Table A6**

*Motivation for Adolescent Health Behaviors*

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<th>Findings</th>
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<tbody>
<tr>
<td>Douthitt (1994)</td>
<td>132 9th, 10th, and 11th graders</td>
<td>No conceptual framework identified; correlational research design</td>
<td>Identify psychological determinants of exercise adherence and compare those determinants of males and of females.</td>
<td>Structured: 1. Perceived romantic appeal was inversely related to exercise adherence for males ($F = 5.6, p = .02$). 2. Perceived athletic competency was an inversely significant predictor of exercise adherence in the structured environment ($F = 10.8, p = .003$) Unstructured: 1. None of the variables were predictive of male exercise adherence. 2. Perceived global self-worth ($F = 6.0, p = .02$) and perceived physical appearance ($F = 6.1, p = .007$) were inversely related to females exercise adherence.</td>
</tr>
<tr>
<td>Keats, Culos-Reed, Courneya, &amp; McBride (2007)</td>
<td>95 adolescent cancer survivors placed into two groups: (a) elicitation group (b) determinants group</td>
<td>Theory of Planned Behavior (TPB) Correlational research design</td>
<td>Examine the value of the Theory of Planned Behavior in understanding adolescent survivors’ motivation to engage in physical activity.</td>
<td>Findings from the elicitation group revealed that the primary motivations for cancer-surviving adolescents to participate in physical activity included (a) keeping physically fit and staying healthy, (b) staying busy and connected with friends, (c) maintaining normalcy, (d) managing weight, (e) increasing energy, (f) increasing self-confidence, (g) reducing stress, and (h) speeding recovery after cancer treatments. No statistical tests were conducted at this stage.</td>
</tr>
<tr>
<td>Grunfeld (2004)</td>
<td>239 undergraduate British college students 18-22 years of age ($M_{age} = 19$ years)</td>
<td>Protection motivation theory; correlational research design</td>
<td>Examine adolescents’ intention to perform safe sun-exposure behaviors.</td>
<td>1. Correlational analyses revealed that knowledge ($r = -.13, p &lt; .05$), previous behavior ($r = -.614, p &lt; .01$), vulnerability ($r = .434, p &lt; .01$), and self-efficacy ($r = .400, p &lt; .01$) were all significantly correlated with skin care behaviors. 2. Vulnerability ($F = 8.754, p &lt; .01$) as a factor in threat appraisal, previous similar behavior, and self-examination behavior ($F = 19.001, p &lt; .01$) were predictive of intention to perform sun-safe behaviors.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Sample</td>
<td>Conceptual Framework and Design</td>
<td>Purpose</td>
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</table>
| Lemieux, Fisher, and Pratto (2008) | 306 multicultural students from three inner city schools in the United States ($M$ age = 16 years) | Information-motivation behavioral skills model; quasi-experimental nonequivalent control group design | Evaluate the effect of a music-based HIV prevention intervention on motivation for HIV prevention, behavioral intentions, and HIV risk behaviors. | 1. No change in attitude and/or motivation was noted in the experimental group after the intervention.  
2. A marginal increase in perceived social support was found among participants in the treatment group ($F = 3.2, p = .07$).  
3. Increased HIV prevention motivation was related to increased condom use ($F = 4.32, p < .05$).  
4. Among never sexually active females, a significant decrease in perceived social normative support for abstinence was noted ($F = 3.93, p < .05$) in the control group but not in the experimental group.  
5. Perception of vulnerability to HIV infection increased across time in the treatment group ($F = 3.44, p = .06$) and remained constant in the control group. |
| Van Exel, de Graaf, & Brouwer (2006) | 112 Dutch youths 12-15 years of age | No conceptual framework identified; qualitative Q-methodology design | Evaluate attitudes about health lifestyle in adolescents. | Classifications distinguishing adolescent attitudes regarding about their lifestyle were identified; however, some similarities across groups were noted:  
1. Independence was important.  
2. Peer relationships were important.  
3. Peer acceptance was important.  
4. The future was not a matter of concern. |
APPENDIX B

IRB APPROVAL
Form 4: IRB Approval Form  
Identification and Certification of Research  
Projects Involving Human Subjects  

UAB’s Institutional Review Boards for Human Use (IRBs) have an approved Federalwide Assurance with the Office for Human Research Protections (OHRP). The Assurance number is FWA00005960 and it expires on August 25, 2012. The UAB IRBs are also in compliance with 21 CFR Parts 50 and 56 and ICH GCP Guidelines.

Principal Investigator: MORRISON, SHANNON  
Co-Investigator(s):  
DAVIES, SUSAN L  
EVANS, RETTA R  
VANCE, DAVID E  

Protocol Number: X090820006  
Protocol Title: The Role of Parental Autonomy Support in the Motivation of the Health Behaviors of Diet and Exercise in Older Adolescents  

The IRB reviewed and approved the above named project on 9/1/09. The review was conducted in accordance with UAB’s Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project received EXPEDITED review.

IRB Approval Date: 9-1-09  
Date IRB Approval Issued: 9/1/09  
Marilyn Doss, M.A.  
Vice Chair of the Institutional Review Board for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.
APPENDIX C

RECRUITMENT INFORMATION GUIDE
Information Guide Regarding Research Study Participation

**Title of Study:** The role of parental autonomy support in the motivation of the health behaviors of diet and exercise in older adolescents. (IRB Protocol Number: X090820006)

**General study information:** This is a study evaluating whether or not the type of relationship you have with your parents (or parental figure) influences the decisions you make about your health. Participation will take an estimated 30-45 minutes to complete and requires that you fill out a few confidential questionnaires. Information obtained from the questionnaire shall be used for research purposes only.

**Participation is completely voluntary. Your grade will not be impacted by your decision to/not to participate!!**

**Eligibility Requirements:**

- You must be between the ages of 18-20, have never married and are not a parent.
- You must also have two parental figures in your life. This does not mean two biological parents, but someone who serves the role as parent to you. For example, some people were raised by their grandparents or aunts/uncles. Some people may have adoptive parents.
- You must not be restricted to a specific diet or be unable to participate in exercise due to a health problem. If you have certain diet/exercise restrictions but still have choices in your diet and/or if you can participate in any type of physical activity, you are eligible.
- You must be able to read/write English
- If you have an adjacent class (depending on the time and location of the class) you may not have time to participate.

**Reimbursement for Time:** All persons who are eligible and chose to participate in this study will receive a $5.00 lunch voucher that can be redeemed in the Food
Court in the Theron Montgomery Building (TMB). *If you decide to participate but realize during the completion of the questionnaires that would like to change your mind and withdraw from the study, you may simply return the forms to your manila envelope and return them to me. No one will know of your decision to withdraw and you will still receive a lunch voucher.*

**How Do I Participate?** If you choose to participate and meet the eligibility requirements, you may complete the attached study packet. Simply return it at the desk by the door before you leave to receive your $5.00 voucher.

**How Do I Decline Participation?** If you choose not to participate or do not meet the eligibility requirements, simply leave the packet at your seat or return it to the desk next to the door.

**What if there is a question I don’t want to answer?** If you do not feel comfortable answering any question, you may leave it blank or write “NA” for that item.

**Thank you for your time. Have a great day!**

---

**Researcher Contact Information:** Shannon A. Morrison (samorris@uab.edu)

**Questions/Concerns:** If you have questions about your rights as a research participant, or concerns or complaints about the research, you may contact Ms. Sheila Moore. Ms. Moore is the Director of the Office of the Institutional Review Board for Human Use (OIRB) at the University of Alabama at Birmingham (UAB). Ms. Moore may be reached at (205) 934-3789 or 1-800-822-8816. If calling the toll-free number, press the option for “all other calls” or for an operator/attendant and ask for extension 4-3789. Regular hours for the Office of the IRB are 8:00 a.m. to 5:00 p.m. CT, Monday through Friday. You may also call this number in the event the research staff cannot be reached or you wish to talk to someone else.”
APPENDIX D

QUESTIONNAIRES
DEMOGRAPHIC INFORMATION

1. Your age in years: ________ years

2. Are you a:
   1. _______ male
   2. _______ female

3. What is your residence currently?
   1. _____ in my parents’ home
   2. _____ in a college dorm
   3. _____ in a home or apartment on my own or shared.
   4. _____ military
   5. _____ other (please specify): ________________

4. What is your race/ethnic background?
   1. _______ Black or African American
   2. _______ Hispanic or Latino
   3. _______ Asian
   4. _______ American Indian/Alaska Native
   5. _______ Native Hawaiian or Other Pacific Islander
   6. _______ White
   7. _______ Other (Please specify: ________________)

5. What is the structure of your immediate family?
   1. _______ Two biological parents
   2. _______ One biological and one step-parent
   3. _______ Single biological parent
   4. _______ Biological grandparent(s)
   5. _______ Adoptive parents
   6. _______ Other (Please specify________)

6. What is your current college status?
   1. _____ Freshman
   2. _____ Sophomore

7. What is your mother’s job title or what is her job called?
   __________________________________________

8. What does your mother do at her job?
   __________________________________________

9. How many grades of school (K – 12) did your mother finish completely? ________
10. Please check what training/education your mom finished beyond High School:

1. ____ No education completed beyond grade indicated above
2. ____ GED
3. ____ Associate degree from a vocational, technical or community college
4. ____ Bachelor’s degree from a 4 year undergraduate college or university
5. ____ Graduate School degree
6. ____ Other (Please specify______________)

11. What is your father’s job title or what is her job called?

________________________________________________________________________

12. What does your father do at his job?

________________________________________________________________________

13. How many grades of school (K – 12) did your father finish completely? _________

14. Please check what training/education your father finished beyond High School:

1. ____ No education completed beyond grade indicated above
2. ____ GED
3. ____ Associate degree from a vocational, technical or community college
4. ____ Bachelor’s degree from a 4 year undergraduate college or university
5. ____ Graduate School degree
6. ____ Other (Please specify______________)

Thank you for completing this form. The information below is for the researcher only. **Do not fill this out.**

15. _______Job code M
16. _______Ed code M
17. _______Job code F
18. _______Ed code F
MATERNAL AND PATERNAL AUTONOMY SUPPORT SCALES

Thoughts about My Parents

Please answer the following questions about your mother and your father. If you do not have any contact with one of your parents (for example, your father), but there is another adult of the same gender living with your house (for example, a stepfather) then please answer the questions about that other adult. If you have no contact with one of your parents, and there is not another adult of that same gender with whom you live, then leave the questions about that parent blank.

Please indicate whether your mother is your:

__Biological mother __Adoptive mother __Step-mother __Grandmother __Other

First, questions about your mother.

1. **My mother seems to know how I feel about things.**
   
   1 2 3 4 5 6 7
   
   not at all somewhat very true true true

2. **My mother tries to tell me how to run my life.**
   
   1 2 3 4 5 6 7
   
   not at all somewhat very true true true

3. **My mother, whenever possible, allows me to choose what to do.**
   
   1 2 3 4 5 6 7
   
   not at all somewhat very true true true

4. **My mother listens to my opinion or perspective when I’ve got a problem.**
   
   1 2 3 4 5 6 7
   
   not at all somewhat very true true true

5. **My mother allows me to decide things for myself.**
   
   1 2 3 4 5 6 7
   
   not at all somewhat very true true true

6. **My mother insists upon my doing things her way.**
   
   1 2 3 4 5 6 7
   
   not at all somewhat very true true true
7. My mother is usually willing to consider things from my point of view.
   1 2 3 4 5 6 7
   not at all  somewhat true very true

8. My mother helps me to choose my own direction.
   1 2 3 4 5 6 7
   not at all  somewhat true very true

9. My mother isn't very sensitive to many of my needs.
   1 2 3 4 5 6 7
   not at all  somewhat true very true

Now questions about your father.

Please indicate whether your father is your:

___Biological father  ___Adoptive father  ___Step-father  ___Grandfather  ___Other

1. My father seems to know how I feel about things.
   1 2 3 4 5 6 7
   not at all  somewhat true very true

2. My father tries to tell me how to run my life.
   1 2 3 4 5 6 7
   not at all  somewhat true very true

3. My father, whenever possible, allows me to choose what to do.
   1 2 3 4 5 6 7
   not at all  somewhat true very true

4. My father listens to my opinion or perspective when I've got a problem.
   1 2 3 4 5 6 7
   not at all  somewhat true very true

5. My father allows me to decide things for myself.
   1 2 3 4 5 6 7
   not at all  somewhat true very true

6. My father insists upon my doing things his way.
   1 2 3 4 5 6 7
   not at all  somewhat true very true
7. **My father is usually willing to consider things from my point of view.**

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8. **My father helps me to choose my own direction.**

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9. **My father isn't very sensitive to many of my needs.**

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THE SELF-DETERMINATION SCALE (SDS)

Instructions: Please read the pairs of statements, one pair at a time, and think about which statement within the pair seems more true to you at this point in your life. Indicate the degree to which statement A feels true, relative to the degree that Statement B feels true, on the 5-point scale shown after each pair of statements. If statement A feels completely true and statement B feels completely untrue, the appropriate response would be 1. If the two statements are equally true, the appropriate response would be a 3. If only statement B feels true, And so on.

1. A. I always feel like I choose the things I do.
   B. I sometimes feel that it's not really me choosing the things I do.
   **Only A feels true**  1  2  3  4  5  **Only B feels true**

2. A. My emotions sometimes seem alien to me.
   B. My emotions always seem to belong to me.
   **Only A feels true**  1  2  3  4  5  **Only B feels true**

3. A. I choose to do what I have to do.
   B. I do what I have to, but I don't feel like it is really my choice.
   **Only A feels true**  1  2  3  4  5  **Only B feels true**

4. A. I feel that I am rarely myself.
   B. I feel like I am always completely myself.
   **Only A feels true**  1  2  3  4  5  **Only B feels true**

5. A. I do what I do because it interests me.
   B. I do what I do because I have to.
   **Only A feels true**  1  2  3  4  5  **Only B feels true**
6. A. When I accomplish something, I often feel it wasn't really me who did it.
   B. When I accomplish something, I always feel it's me who did it.
   Only A feels true 1 2 3 4 5 Only B feels true

7. A. I am free to do whatever I decide to do.
   B. What I do is often not what I'd choose to do.
   Only A feels true 1 2 3 4 5 Only B feels true

8. A. My body sometimes feels like a stranger to me.
   B. My body always feels like me.
   Only A feels true 1 2 3 4 5 Only B feels true

9. A. I feel pretty free to do whatever I choose to.
   B. I often do things that I don't choose to do.
   Only A feels true 1 2 3 4 5 Only B feels true

10. A. Sometimes I look into the mirror and see a stranger.
    B. When I look into the mirror I see myself.
    Only A feels true 1 2 3 4 5 Only B feels true
AUTONOMOUS REGULATORY STYLE SCALE (ARSS) (DIET)

The following question relates to the reasons why you would either start eating a healthier diet or continue to do so. Different people have different reasons for doing that, and we want to know how true each of the following reasons is for you. All 15 response are to the same question.

Please indicate the extent to which each reason is true for you, using the following 7-point scale:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>somewhat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>very true</td>
<td></td>
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<tr>
<td>true</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

The reason I would **eat a healthy diet** is:

1. **Because I feel that I want to take responsibility for my own health.**
   - 1 2 3 4 5 6 7
   - not at all somewhat true
   - very true

2. **Because I personally believe it is the best thing for my health.**
   - 1 2 3 4 5 6 7
   - not at all somewhat true
   - very true

3. **Because I have carefully thought about it and believe it is very important for many aspects of my life.**
   - 1 2 3 4 5 6 7
   - not at all somewhat true
   - very true

4. **Because it is an important choice I really want to make.**
   - 1 2 3 4 5 6 7
   - not at all somewhat true
   - very true

5. **Because it is consistent with my life goals.**
   - 1 2 3 4 5 6 7
   - not at all somewhat true
   - very true

6. **Because it is very important for being as healthy as possible.**
   - 1 2 3 4 5 6 7
   - not at all somewhat true
   - very true
AUTONOMOUS REGULATORY STYLE SCALE (ARSS) (EXERCISE)

The following question relates to the reasons why you would either start to exercise regularly or continue to do so. Different people have different reasons for doing that, and we want to know how true each of the following reasons is for you. All 15 response are to the one question.

Please indicate the extent to which each reason is true for you, using the following 7-point scale:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>not at all</td>
<td>somewhat</td>
<td>very</td>
<td>true</td>
<td>true</td>
<td>true</td>
<td></td>
</tr>
</tbody>
</table>

The reason I would exercise regularly is:

1. **Because I feel that I want to take responsibility for my own health.**

   1   2   3   4   5   6   7
   not at all somewhat very true true true

2. **Because I personally believe it is the best thing for my health.**

   1   2   3   4   5   6   7
   not at all somewhat very true true true

3. **Because I have carefully thought about it and believe it is very important for many aspects of my life.**

   1   2   3   4   5   6   7
   not at all somewhat very true true true

4. **Because it is an important choice I really want to make.**

   1   2   3   4   5   6   7
   not at all somewhat very true true true

5. **Because it is consistent with my life goals.**

   1   2   3   4   5   6   7
   not at all somewhat very true true true

6. **Because it is very important for being as healthy as possible.**

   1   2   3   4   5   6   7
   not at all somewhat very true true true

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