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Health Promotion during Midlife:
The Influence of Internal Health Locus of Control and Future Time Perspective

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Thesis submitted to the
Eberly College of Arts and Sciences
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in partial fulfillment of the requirements
for the degree of

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ABSTRACT

Health Promotion during Midlife: The Influence of Internal Health Locus of Control and Future Time Perspective

Sarah T. Stahl

Health promoting behaviors are typically categorized as behaviors that move individuals towards optimal health while concurrently decreasing one's susceptibility to disease and illness (Becker & Arnold, 2004; Breslow, 1999). When compared to other developmental age periods, less is known about health promotion in midlife (Merrill & Verbrugge, 1999). Thus, the present study examined the relations among demographic variables, future time perspective, internal health locus of control, and middle-aged adults' engagement in health promotion. Data from 109 middle-aged adults between the ages of 40 and 66 were collected via an online survey. Results indicated that the data fit the model poorly χ^2 (df = 6; N = 109) = 13.791 $p < .05$, CFI = .867, TLI = .667, RMSEA = .110. Despite the poor fit, the path model accounted for a substantial amount of variance in health promotion ($R^2 = .30$). The model indicated that future time perspective and internal health locus of control were associated with engagement in health promotion. In addition, both age and adults' perceptions of the severity of their chronic health conditions were associated with future time perspective. Findings from this study may help inform the design of health interventions. Specifically, results suggest that interventions should consider integrating future time perspective into a theoretical framework in understanding why middle-aged adults choose to engage in health promotion.

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Introduction

Relative to other age periods, limited research exists on midlife (Brim, Ryff, & Kessler, 2004). One explanation for this is that despite the popular conception of a midlife crisis, which has been difficult to validate empirically (Rosenberg, Rosenberg, & Farrell, 1999), midlife has been viewed as a calm, stable age period, where little development took place (Skaff, 2006). In Erikson's theory on psychosocial development (Erikson, 1982) he described midlife as a time when individuals are concerned with future generations and are thus occupied with responsibilities tied to work, family, and community roles. In addition to Erikson, researchers have recently suggested that there is wide variability during the course of midlife because the experiences of middle-aged adults are so diverse due to the range of social roles that middle-aged adults are balancing (e.g., spouse, parent, coworker, caregiver, community member, etc.) (Lachman, 2004).

In addition to balancing social roles (e.g., spouse, parent), midlife is a time when adults may begin to experience declines in their physical health (e.g., hearing, vision problems). Researchers suggest that middle-aged adults can draw upon the experiences and knowledge they have gained thus far to maintain and improve their physical and psychological well-being into late life (Lachman, 2004). Thus, research is needed to understand how middle-aged adults compensate for age-related losses that emerge during midlife. There is growing interest in optimizing the aging process (Lachman, 2004); therefore, focusing on midlife development would be crucial to delay or minimize biological, social, and psychological changes that occur with old age (Moen & Wethington, 1999).

In the health domain, studies generally report that older adults tend to engage in more health promoting behaviors than younger adults (Becker & Arnold, 2004; Zanjani Schaie, &

Willis, 2006). Health promoting behaviors (e.g., exercise, dietary management) are defined as behaviors that may increase longevity while concurrently decreasing one's susceptibility to disease (Becker & Arnold, 2004). Researchers caution that engagement in health promotion can not be generalized to all health behavior domains (Zanjani et al., 2006). For example, although older adults may be engaging in more dietary changes than middle-aged adults (see Becker & Arnold, 2004), it is uncertain whether middle-aged adults are choosing other health promoting behaviors (e.g., physical activity).

Furthermore, although equivocal, additional research indicates that engagement in health promotion may be related not only to age but to health status, as well. For example, having a chronic health condition in midlife may increase the likelihood that middle-aged adults engage in health promoting behaviors because being diagnosed with a disabling condition may motivate adults to change their current health habits (Zanjani et al., 2006). Other research (Traywick & Schoenberg, 2008), however, suggests that having a chronic health condition, specifically coronary heart disease, may decrease the likelihood that women participate in health promotion because their compromised health status may decrease their exercise self-efficacy, which limits participation in health promotion, specifically physical activity. Thus, it is important to disentangle the influence of chronic health conditions in health promoting behavior.

Engagement in health promotion may also be influenced by specific psychological constructs. For example, numerous studies suggest that a strong sense of internal health locus of control is related to better overall health, greater frequency of health promoting behaviors, and decreases in functional limitations (Ziff, Conrad, & Lachman, 1995). Internal health locus of control is defined as having a perceived sense of personal power over the outcomes of one's health (e.g., having feelings that one can control their own health destiny) (Lachman & Firth,

2004; Wallston, Wallston, & DeVellis, 1978). However, it is unclear which specific types of health behaviors (e.g., caloric restrictions, exercise, stress management techniques) are influenced. Additionally, Skaff (2006) reported a dynamic relationship between individuals' control beliefs and environment. However, there is little empirical research that investigates whether life events, such as a chronic health condition diagnosis during midlife, influences internal health locus of control. Because those with a greater sense of internal control are more likely to take action when it comes to their health treatment (e.g., seeking help after a medical diagnosis) (Lachman & Weaver, 1998b), research should explore whether control beliefs are related to participation in health promoting behaviors.

Lastly, socioemotional selectivity theory (SST, Carstensen, Isaacowitz, Charles, 1999) asserts that individuals prioritize goals depending on the amount of time he or she perceives is left to live (i.e., future time perspective, FTP). A scarcity of FTP research exists in the health domain (Löckenhoff, & Carstensen, 2007); however, FTP may relate to engagement in health promotion. According to SST, when future time is perceived as limited, adults set emotionally meaningful goals in order to achieve short-term benefits. In contrast, when future time is perceived as unlimited, adults set goals to optimize the future (Lang & Carstensen, 2002). Few researchers have investigated whether having an expansive, unlimited FTP influences engagement in health promoting behaviors (e.g., exercise) because adults are focusing on goals that optimize their future (e.g., increase longevity). Moreover, a majority of work examining FTP compares older adults to younger adults; as a result, it is unclear how midlife influences adults' future time perspective, especially for comorbid older middle-aged adults, who may be preparing for the transition into old age (Cate & John, 2007).

Despite efforts to increase health promoting behaviors in adults (e.g., increased promotion of the My Pyramid food guide, Healthy People 2010 objectives) an estimated 60% of adults are not physically active, only 25% consume the recommended daily servings of fruits and vegetables (Centers for Disease Control, 2001), and more than one third of adults are considered obese (US Department of Health and Human Services, 2007). Because poor nutrition and an inactive lifestyle are associated with poor health and increased risk for obesity, a more thorough understanding of the demographic and psychological influences of engaging in health promotion is important so that future health intervention programs can maximize the likelihood of success. The current study examined the personal and psychological correlates of health promotion in a sample of community-dwelling middle-aged adults.

Review of the Literature

The following review of the literature is divided into six sections. The first section describes the age period of midlife. The second section summarizes the area of health promotion. The third section describes how internal health locus of control influences health promotion. The fourth section summarizes how future time perspective may influence health promotion. The final section outlines the current study's research question and hypotheses.

Midlife

Emergence of Midlife as a Separate Age Period

The U.S. Census Bureau (2005) reports that there are 82.7 million middle-aged adults between the ages of 40 and 60, (28 percent of the population), currently residing in the United States. Moreover, this age group is one of the fastest growing, and within the last five years, the population estimate in this age group increased by ten million. However, this boost is not surprising because it is reflective of the Baby Boom cohort (b. 1946-1962) moving through

middle-age (U.S. Census Bureau, 2005). The entrance of the largest cohort in history (baby boomers) into midlife has created a large demand for information regarding psychological and social development that occurs during this stage of life. Midlife research has often been neglected by researchers and, until recently, was described in two conflicting manners; as either a calm, stable phase on the way to old age (Moen & Wethington, 1999) or as a hectic time of crisis (which has later been debunked) (Wethington, 2000).

A majority of midlife research was generated from the Midlife in the United States (MIDUS) National Survey. MIDUS defines the age period from 40-60 years as reflective of midlife (Brim, et al., 2004). However, Lachman (2004) states that it is not uncommon for researchers to add a ten year range on either end, especially the upper limit, because Americans are living longer and remaining healthier. In addition, with an expanding period of midlife, researchers may find it useful to compare young middle-aged adults to older middle-aged adults because the experiences and social roles (e.g., spouse, caregiver) of a 40-year-old entering middle adulthood may be markedly different than the experiences and social roles (e.g., widow, grandparent) of a 60-year-old leaving middle adulthood and entering old age (Lachman) due to age and cohort differences. Such a wide midlife age range (20 to 40 years) may obscure important within group differences.

One suggestion as to why the study of midlife development has emerged is due to the western cultural ideal to remain youthful and vibrant (Lachman, 2004; Saucier, 2004). A majority of baby boomers (who are considered the first large group of affluent and knowledgeable adults to pass through midlife), are interested in the ways in which they can optimize the aging process; accordingly, this cohort may have a marked interest in health promotion because of the need to maintain and prevent future physical problems (Lachman).

Midlife health is often an indicator of old age morbidity (Grzywacz, 2007) and thus, midlife provides a window of opportunity for adults to recognize and change the course of their own psychological and physical aging.

Salient Issues in Midlife

There is evidence to suggest that middle adulthood is characterized by both positive and negative aspects. For example, Lachman (2004) found that middle-aged adults frequently complained about not having enough time to get everything done, their memory, and changes in the physical health, including concerns about chronic illnesses. In contrast, the adults noted that the best aspects of midlife were the wealth of experiences that they had gained thus far in life and, having a sense of freedom, independence, and personal control. This dynamic interplay of both gains and losses can be indicative of midlife if researchers view this age period from a lifespan perspective, where one's context and environment are influencing the diversity of midlife experiences (see Baltes, 1987).

Secondly, midlife is considered to be an age period when adults take on a variety of social roles and are expected to balance demands from multiple domains (Grzywacz, 2007). For example, midlife is often characterized as a time when adults are moving in and out of various roles and relationships, which forces them to alter components of their identity as they become spouses, divorcees, grandparents, caregivers, coworkers, volunteers, and retirees (Moen & Wethington, 1999). Middle-aged adults' lives are often illustrated as an interrelation of numerous pathways such as schooling, marriage, occupation, parenthood, and caregiving (Moen & Wethington). Because of the multitude of roles that middle-aged adults can pursue, there is great individual variability in social roles during this time. Further, it is possible that adults may display success in one domain (e.g., work) but may feel overwhelmed in another (e.g., family).

Therefore, middle-aged adults can display an array of gains and losses with respect to the multiple domains of life (Lachman, 2004).

In sum, although there has been an increase in research, less is known about midlife than any other developmental period (e.g., infancy, childhood, adolescence, older adulthood) (Lachman, 2004; Miller & Lachman, 2000). Midlife is a time when chronic illnesses or diseases (e.g., high blood pressure, arthritis) that threaten middle-aged adults' sense of health and well-being begin to emerge. Such physical ailments signal stress because they represent the aging process, which is typically viewed negatively in Western cultures (Saucier, 2004). However, midlife is a time when adults can draw on the experiences they have gained from various roles and are aware of the opportunities that exist to enhance their future quality of life. It is also a time when a sense of control can motivate adults to improve declines in physical and cognitive functioning (Lachman, 2004).

Health Promotion

Concept of Health Promotion

Research on health behaviors has begun to switch focus from disease prevention to the concept of health promotion. Disease prevention signifies environmental and personal attempts to decrease the prevalence rates of cancers and other diseases. However, health promotion is not synonymous to being disease free; it is a term that signifies altering one's behavior (e.g., adopting physical activity) to maximize health potential (e.g., improved cardiovascular fitness) while concurrently enhancing capacity for living (e.g., decreased functional disability) (Breslow, 1999; Grzywacz & Keyes, 2004). This switch from an interest in disease prevention to health promotion is primarily due to individual's increasing life expectancies, which may be a result of the decreased threat of disease (e.g., smallpox, measles) (Breslow). Although health promotion

should not be confused with disease prevention, the two concepts are intertwined because engaging in health promotion practices can prevent certain chronic illnesses such as coronary heart disease (Breslow). Interventions that focus on health promotion highlight the idea of achieving optimal health (Grzywacz & Keyes, 2004) by implementing self-initiated actions that serve to enhance overall well-being. Additionally, the idea of a healthy lifestyle has been described as comprised of both health promotion and disease prevention components (Walker, Sechrist, & Pender, 1988). Health behaviors, both risky (e.g., smoking) and promotive (e.g., exercise) are highly predictive of illness, disability, and mortality rates (Grzywacz & Keyes). Leventhal and colleagues (2001) suggest that engagement in health promoting behaviors (e.g., physical activity) may minimize the negative effects of physical (e.g., decrease in muscle strength) and psychological (e.g., cognitive decline) changes that result from normative aging. More specifically, engagement in physical activity is considered a key component in maintaining cognitive health and decreasing the onset of age-related cognitive declines. A meta-analysis, conducted by Colcombe and Kramer (2003), of physical activity interventions from 1996 to 2001 indicated that aerobic exercise training significantly enhanced cognitive functioning, particularly executive functioning, of sedentary older adults.

Callaghan (2005) identified two major factors that lead to an increasing probability for adults to engage in health promoting behaviors. An adequate income and having health insurance was associated with increased frequency of healthy promotion and exercise self-efficacy (e.g., perceived ability in performing physical activity). In general, social support, being married, and having few or no children was predictive of an increased frequency of health promoting behaviors. Those with a chronic condition or disability also reported practicing more healthy behaviors than those without a chronic health condition (Callaghan). With respect to gender,

there is an abundance of research to suggest that men are more likely to engage in regular physical activity when compared to women (e.g., Hageman, Walker, Pullen, Boeckner, & Oberdorfer, 2005; Rimer, McBride, Crump, 2001; Seger, Spruijt-Metz, & Nolen-Hoeksema, 2006). However, women are more likely to talk to their primary care physicians and seek medical help when compared to men, thus indicating that women may be more likely to engage in a wide variety of health promoting behaviors (George, 2001).

Research is mixed with respect to identifying the frequency of health promoting behaviors across age groups. Results appear to depend on the health promotion domain of interest. For example, in the physical activity domain, a plethora of research (see Nelson, Rejeski, Blair, Duncan, Judge, King et al., 2007; Prohaska et al., 2006,) suggests that engagement in regular physical activity decreases with age and older adults are more likely to be sedentary when compared to middle-aged and younger adults. Because fewer than one third of older adults participate in regular exercise, physical inactivity in late-life is considered to be a major public health threat because of the increased medical costs and health outcomes (e.g., diabetes) that are associated with such a lifestyle (Prohaska et al.).

Some research (George, 2001; Leventhal, Rabin, Leventhal, & Burns, 2001; Walker, Volkan, Sechrist, & Pender, 1988; Zanjani, et al., 2006) suggests that older adults are more likely to engage in health promoting behaviors than middle-aged adults because death and morbidity are salient issues for older adults; which are motivators for behavior change and engagement in health promotion. Furthermore, research by Zanjani and colleagues indicated that health behavior change varies by health domain (e.g., food consumption, seeking medical care) and adults' health status (e.g., cardiovascular disease status versus condition free status). Particularly, adults who were diagnosed with cardiovascular disease were more likely to engage in three

specific health promotion domains (e.g., food preparation, food consumption, and medical care) than adults with a condition free status (Zanjani et al.). These adults' health behavior change may represent their awareness of health promotion strategies as means to reduce the risk of future illness (caused by either the aging process or co-morbidity) or premature mortality. Thus, health behavior change and engagement in health promotion may be related not necessarily to an individual's age but their current health status.

In a second study, Becker and Arnold (2004) examined whether older adults were more likely to engage in a variety of health promoting behaviors when compared to middle-aged adults. The authors defined health promoting behaviors as behaviors that were intended to maintain or enhance physical functioning (e.g., cardiovascular performance) and psychological functioning (e.g., perceived well-being and happiness). Results indicated that older adults were only more likely to engage in health responsibility (e.g., medical checkups) and nutrition (e.g., balanced diet) behaviors than middle-aged adults. When compared to older adults, middle-aged adults were more likely to engage in stress management behaviors (e.g., relaxation techniques). This suggests that there may be differences in the types of health promoting behaviors in which middle-aged adults choose to engage (Becker & Arnold). The authors note the importance of continuing to conduct research regarding why certain age groups may only choose to engage in particular types of health behaviors (e.g., nutrition, physical activity) because this may challenge the prevailing idea that older adults are more readily able to adopt health promoting behaviors than their middle-aged counterparts.

Research on gender differences in health promotion assert that females are more likely than males to engage in a wider variety of health promoting behaviors (Callaghan, 2005; George, 2001). One explanation is that women are more likely to report their physical and

emotional symptoms to health care professions, are more likely to seek health care, and are more willing to talk to their physicians regarding their health status. Although there is a profusion of research to suggest that women engage in less physical activity when compared to males (e.g., Hageman, et al., 2005; Rimer, et al., 2001; Seger, et al., 2006), some researchers assert that women may be more likely to care for their bodies in other ways (e.g., nutrition, seek health screens) because of the western beauty cultural ideal to remain vibrant and young. This Western cultural ideal signifies norms for women's appearance, specifically that "looking old" is undesirable, thus influencing women to be more aware of their aging bodies (Gosselink, Cox, McClure, & DeJong, 2008; Saucier, 2004).

Health Issues during Midlife

Midlife is often a time when physical changes begin to surface (Merrill & Verbrugge, 1999). Adults' health habits and lifestyle choices (along with genetics) have a significant influence on the emergence of such physical changes (e.g., increase weight gain) and the ability to cope with these changes. Midlife is a time when numerous physiologic changes are surfacing. For example, the heart starts losing its effectiveness to pump and the body's basal metabolic rate gradually declines (Katchadourian, 1987). In addition, sensory changes are becoming noticeable. Middle-aged adults' senses of smell and taste begin to diminish. Gradual hearing loss begins and the eye's ability to accommodate continues to decline (Horvath & Davis, 1990). Furthermore, sleep patterns become more disruptive, as more frequent wakings occur throughout the night. Although the prevalence of physical decline begins in midlife, there are also positive health changes that are occurring. For example, there is a decrease in accidents and the susceptibility to colds and allergies starts to decline (Merrill & Verbrugge).

Even though most of the conditions that arise in midlife are nonfatal, the number of chronic conditions that do arise continue to increase with each decade (Merrill & Verbrugge, 1999). Further, within our culture's obesogenic environment, researchers propose that the number and severity of chronic illnesses (e.g., heart disease) may continue to increase at an alarming rate (Kumanyika, Jeffery, Morabia, Rittenbaugh, & Antipatis, 2002; Sinburn, Gill, & Kumanyika, 2005). Men have a higher incidence of fatal diseases (e.g., coronary heart disease, stroke) while women have a higher prevalence of nonfatal diseases (e.g., arthritis, varicose veins) (Merrill & Verbrugge; Verbrugge, 1985). The risk of acquiring a disease highly depends not only on genetic predisposition but one's engagement in health-promoting behaviors. Delaying or preventing a chronic condition or physiologic decline depends to a large extent on the manner in which middle-aged adults live their lives (e.g., whether they choose to engage in physical activity) and care for themselves (e.g., blood pressure screenings) (Merrill & Verbrugge; Wister & Romeder, 2002). Some researchers suspect that because of the increased prevalence in chronic illnesses, middle-aged adults may be spending more time dealing with these conditions (e.g., disease treatment) than focusing on health promoting practices and ways to increase longevity (Lachman, 2004). However, other research (see Zanjani et al.) asserts that being diagnosed with a chronic health condition may motivate individuals to change their current lifestyle and engage in more health promotion. For example, Blanchard and colleagues (2003) found that about half of adult cancer survivors quit smoking and made a change to their dietary behavior after their cancer diagnosis.

Psychological Influences on Health Promotion

Internal Health Locus of Control

Internal control beliefs are defined as one's belief that outcomes (e.g., health status) are due to internal, dispositional forces (e.g., self-efficacy) and less so due to external sources (e.g., chance, physicians) (Skaff, 2007, Wallston, Wallston, & DeVellis, 1978). In other words, individuals with high internal locus of control believe that their behaviors can bring about a desired outcome (Lachman & Firth, 2004). Control beliefs influence the way in which individuals deal with stressful events (e.g., diagnosis of a chronic disease) (Rodin, 1986);

Midlife may be indicative of peak internal control and self-efficacy because, when compared to other age periods, midlife is characterized by an increase in leadership roles (e.g., spouse, parent) and responsibilities (e.g., work, family duties) (Clark-Plaskie & Lachman, 1999). Longitudinal research on global control beliefs (e.g., control beliefs collapsed across domain) indicates that midlife is characterized by high levels of internal control, followed by chance factors and beliefs in powerful others. This pattern is reversed in older adults where beliefs in powerful others is the greatest, followed by chance factors and internal control (Clark-Plaskie & Lachman).

Conversely, within life-span developmental theory (see Baltes, 1987), because of the gains (e.g., increased confidence in work domain), and losses (e.g., decreased physical ability in health domain), that middle-aged adults experience; there are shifts in control beliefs within each of these domains (Skaff, 2006). Thus, global control measures may not be particularly useful. What many researchers conclude (Clark-Plaskie & Lachman, 1999; Lachman & Firth, 2004; Skaff, 2006,) is that some domains, specifically health, work, and family, are more valued in midlife than are others. Therefore middle-aged adults' sense of internal control has been hypothesized to vary by domain. For example, the work domain is especially important in

midlife; therefore middle-aged adults often perceive a greater sense of control in this domain when compared to younger and older adults (Lachman & Firth).

Although middle-aged adults typically report internal control beliefs for the health domain (Clark-Plaskie & Lachman, 1999), researchers warn that the health domain may be more of a challenge to control because of the inevitable changes that occur with aging (Skaff, 2006). Lachman and Weaver (1998) assert that although previous research on control beliefs indicated that adult's internal control beliefs continuously decreased with age, their research found no age differences (middle-aged adults versus younger and older adults) in the health domain, which may be indicative of widespread attention in the media to take control of one's health in order to optimize aging.

Research suggests a strong link between sense of control and well-being (Skaff, 2007). A greater sense of internal locus of control is often associated with better adjustment to chronic disease diagnosis (Skaff, 2007), better self-rated health, less severe physical limitations (Lachman, 2004), fewer acute and chronic illnesses (Lachman & Weaver, 1998b), and imperative for successful aging (Lachman & Weaver) because adults are better equipped to adjust to the aging process (Lachman & Firth, 2004). Additionally, those with a higher internal sense of control over their health reported better access to medical care and believed there were many things they could do to stay healthy (Lachman & Weaver, 1998a). Likewise, those with a greater sense of internal control are more likely to engage in health-promoting behaviors because they feel that taking action will make a difference in their health. Results from the MIDUS study (Lachman & Firth) suggest that greater internal control beliefs were related to decreases in hip-waist ratios because adults' engaged in more health promoting behaviors (e.g., dietary management and exercise). Moreover, research suggests that individuals with a greater sense of

internal control may return to homeostasis faster after a stressful event (because of lower levels of cortisol) and have immune systems that are better able to fight disease (Lachman & Weaver, 1998b).

Numerous studies are in accord with the idea that a strong sense of control is related to better health outcomes, health promotion, and higher self-ratings of health. Internal health locus of control has been linked to engagement in a number of health promoting behaviors such as information seeking from health professionals, exercising, seat belt use, taking vitamin supplements, more frequent medical checkups, and limiting red meat intake (Ziff et al., 1995). Because midlife is a time when adults begin to notice physiologic changes and declines, of interest is how internal locus of control explains middle-aged adults' ability to deal with these stressors that characteristically accompany the aging process.

Future Time Perspective

Socioemotional selectivity theory (SST; Carstensen, 1993) proposes that individuals select specific goals depending on the perceptions of their future time to live as being either open ended or limited (e.g., future time perspective, FTP; Lang & Carstensen, 2002). When future time is perceived as open ended, goals that focus on optimizing the future are prioritized. Examples of such goals include information seeking and selecting contacts that could be useful in the distant future. However, when future time is perceived as limited, emotionally meaningful goals are selected, because the individuals are concerned with achieving short term benefits (Lang & Carstensen).

Although there is a paucity of health behavior research that investigates future time perspective as a potential mediator; future time perspective may be a useful construct in understanding why middle-aged adults choose to engage in health promotion. In other words,

because individual's behaviors are influenced by their personal goals (Löckenhoff & Carstensen, 2007), middle-aged adults may choose to engage in health promotion if it is in accord with their goal content (e.g., goal to optimize future or goal to receive short term benefits). In the health domain, adults who view time as open ended (e.g., selecting goals to optimize the future) may engage in activities that involve gathering information about health behaviors and executing a dietary and physical activity routine. On the contrary, individuals who see their future time as unlimited are more likely to not only prevent negative outcomes (e.g., chronic illness) but promote positive outcomes (e.g., emotional and physical well-being). For example, adults who are future oriented may be more motivated to maintain an exercise regimen and seek out preventative measures (e.g., screening tests) than those who are not future oriented (Löckenhoff & Carstensen, 2004). In contrast, adults who view their future time as limited (e.g., selecting immediate short-term goals) may try to immediately alleviate harmful symptoms (i.e., take over the counter medication instead of consulting a physician), avoid negative information, and promote emotional well-being (Löckenhoff & Carstensen, 2007).

Age differences in FTP suggest that young adults focus on future opportunities and older adults focus more on maximizing current positive experiences past (i.e., time is limited) indicating that FTP may become limited with age. Additionally, as people move from young adulthood to old age, priorities shift from meeting information seeking goals to emotionally meaningful goals (Lang & Carstensen, 2002). However, how FTP is depicted at middle adulthood has not been studied extensively, signifying further research in this developmental area. For example, research by Fredrickson and Carstensen (1998) suggest that future time perspective may be influenced more by health status than by chronological age. More specifically, they found that a sample of HIV-positive men had limited future time perspectives,

regardless of age, because they viewed their remaining time to live as limited. Cate and John (2007) note that it is important for future research to investigate how FTP changes as middle-aged adults move into old age and adapt to the negative consequences that are associated with the aging process, including the emergence of physical changes and declines.

When time is perceived as unlimited, individuals foresee many opportunities and engage in activities that extend into the distant future. This may be imperative during midlife, when adults are attempting to achieve goals in a variety of domains (e.g., family, work, health) (Cate & John, 2007). More specifically, midlife is a time when certain aspects of the self, such as confidence, leadership and responsibilities may be increasing (Lachman, 2004), while at the same time, physical declines start to emerge (Merrill & Verbrugge, 1999), reminding middle-aged adults of the aging process (Cate & John). If midlife is a time of both psychological growth and physical decline, then both perspectives of future time may coexist during this period. Furthermore, midlife may be divided into young-midlife, where opportunities are prioritized and adults feel as if there is ample amount of time left; and late-midlife, where losses are prioritized because of the realization that they are getting older and entering old age (Cate & John).

Statement of the Problem

Despite efforts to increase awareness among aging adults regarding the importance of engaging in health promoting behaviors (particularly physical activity), participation in such behaviors remains low (Prohaska, Belansky, Belza, Buchner, Marshall, McTigue, et al., 2006). Thus, identifying strong predictors of health promotion is critical, especially in terms of developing future health interventions. Although the components of the tested model have been found to be related to health behaviors in previous research, most studies have not tested their relation simultaneously. Notably absent in the literature is the attention to the way in which

future time perspective relates to engagement health promotion, specifically in midlife. Future time perspective may be an important construct for practitioners to consider when they are trying to understand how to increase adults' engagement in health promoting behaviors.

Furthermore, the prevalence rates for many chronic health conditions continue to increase with age (Piazza, Charles, & Almeida, 2007); it is estimated that more than 49 million adults are living with some type of chronic condition (e.g., arthritis, heart disease) (Stuifbergen, 2006), and 36 million experience daily limitations due to one or more conditions (Adams, Lucas, & Barnes, 2008). The current western obesogenic environment (see Swinburn, Egger, & Raza, 1999) may be attributable to the increasing prevalence rates of chronic diseases. As a result, it is important to explore how middle-aged adults' perceived functional impairment, that is a result of their chronic health condition status, influences participation in health promotion. However, limited research has explored how perceived severity of dealing with such conditions interacts with psychological variables to influence participation in health promoting behaviors.

Current Study

The current study had two primary objectives. The first objective addressed the gap in the literature regarding midlife research as it relates to health promotion. More specifically, the first objective examined the relations among demographic variables (e.g., age, gender, and perceived impairment due to chronic health conditions), future time perspective, internal health locus of control, and engagement in health promoting behaviors.

The second objective addressed whether future time perspective and health locus of control would mediate the relations between the demographic variables (age, gender, and perceived impairment due to chronic health conditions) and engagement in health promotion. It was hypothesized that the effects of demographic variables on health promotion would be

mediated by psychological processes (e.g., future time perspective, and internal health locus of control). In other words, it was expected that future time perspective and internal health locus of control would be the underlying mechanisms that explained the relation between the independent variables (e.g., demographic variables) and dependent variable (e.g., engagement in health promotion). Total mediation would be present if the effect of demographic variables on health promotion drops to zero when controlling for the two mediators.

Both objectives used a path analysis approach because it allowed for the examination of the overall fit of the data to the model, as well as the mediating role of future time perspective and health locus of control on middle-aged adults' health promoting behaviors.

Research Questions and Hypotheses

The following research question and hypotheses address the two primary objectives of the research. (The hypothesized set of relations can be seen in *Figure 1*).

RQ1. What influences middle-aged adults' engagement in health promoting behaviors?

H1. Age was expected to influence adults' participation in health promoting behaviors.

Current research (see Prohaska et al., 2005 & Nelson et al., 2007) suggests that the frequency of participation in physical activity, the most common type of health promotion, is lowest among older adults. Thus, younger middle-aged adults were expected to engage in more health promoting behaviors than older middle-aged adults.

H2: Age was expected to exert direct effects on future time perspective. Younger middle-aged adults would have a more open ended perspective than older middle-aged adults who would have a limited perspective (Lang & Carstensen, 2002).

- H3: Age was expected to directly influence individuals' health locus of control. Researchers (Lachman & Firth, 2004; and Lachman & Weaver, 1998) indicate that for health-related control, older adults generally had a lower sense of control over their health status than both middle-aged and younger adults. Therefore, older middle-aged adults were expected have a lower internal health locus of control than younger middle-aged adults.
- H4. Callaghan (2005) and George (2001) state that women engage in health promotion more often than men and engage in a wider variety of practices (e.g., restricting daily activities, dietary changes, managing emotional stress); therefore, women were expected to engage in more health promoting behaviors than men.
- H5. Gender was expected to exert direct effects on internal health locus of control. Results from the MIDUS study (Lachman & Firth, 2004) indicate that men often report higher general control than women. Further, in the health domain, women were more likely to believe that their health was in the control of their doctor as compared to men. Thus, it was expected that men will have a greater sense of control over their health when compared to women.
- H6. Middle-aged adults' perceived functional impairment due to their chronic health conditions was expected to directly influence future time perspective. Younger adults with HIV displayed similar goals as older adults, because both perceived their lives as approaching an end (Carstensen & Fredrickson, 1998), thus it was expected that those adults who perceived experiencing more difficulty dealing with their chronic health conditions would view their future time as more limited

than healthier adults (e.g. zero or fewer functional limitations) who would perceive their future as unlimited.

- H7. Middle-aged adults' perceived functional impairment due to their chronic health conditions was expected to directly influence internal health locus of control. Lachman and Weaver (1998) indicate a negative association between the number of chronic conditions at midlife and control over one's health. Thus, middle-aged adults who viewed their functional impairment to be less severe were expected to have a greater internal health locus of control than middle-aged adults who perceived their functional impairment to be more severe.
- H8. Future time perspective was expected to exert direct effects on engagement in health promoting behaviors; middle-aged adults with an unlimited perspective would focus on opportunities to optimize the aging process, and therefore engage in more health promoting behaviors, when compared to middle-aged adults with a limited future time perspective (Löckenhoff & Carstensen, 2007).
- H9. Internal health locus of control was expected to directly influence engagement in health promoting behaviors. Internal health locus of control over one's health status has been linked to engagement in a number of health behaviors such as medical checkups and exercising (Ziff, et al., 1995); therefore, middle-aged adults who have a greater sense of internal control over their health will engage in more health-promoting behaviors than middle aged adults who do not have a perceived sense of control.

Method

Participants

Target Sample

Adults between the ages of 40 and 65 were recruited for the study. The age range was chosen for several reasons. First, current research on middle-aged adults (see Becker & Arnold, 2004; Zanjani, et al., 2006) has included samples that lie within this age range. Second, the period of midlife is typically viewed as a social construction, where the starting and ending point depends on a specific life event (Lachman & James, 1997). More specifically, most adults perceive midlife to start when one reaches their 40th birthday and to end around age 65 years, when one typically retires from full-time employment (Moen & Washington, 1999). Restricting the age range from 40-65 years allowed for the examination of health promotion in participants who were starting to experience the physical changes that accompany normative aging and are possibly coping with the onset of chronic diseases, but who are not at the point of experiencing functional or physical limitations.

Sample Size Considerations

Although there is disagreement in the literature pertaining to model sample size when using path analysis, Kline (2005) asserts that some researchers suggest an $N < 200$ for small effects, an N between 100-200 for medium effects, and an $N < 100$ for large effects. However, model complexity must be considered when determining sample size and researchers suggest that a reasonable ratio of the number of cases to the number of parameters to be estimated should range from 5-10:1. (see Byrne, 2001; Kline, 2005). (Each causal path and construct is counted as a parameter in path analysis, (see Figure 1)). Further, a χ^2 (df=6) power analysis test was conducted using *G Power 3.0*. Results indicated that a sample size of 109 would provide sufficient power ($> .80$) for a proposed model with 15 distinct parameters (see Figure 1) and a medium effect size ($R^2 = .30$).

Procedure

Data were collected during the Fall 2007 and Spring 2008 semesters at West Virginia University via an online data management system, SONA (e.g., <http://wvu.sona-systems.com>). Middle-aged adult participants were recruited by means of undergraduate referrals. Undergraduate students enrolled in psychology courses completed the online study (e.g., Health Promoting Behavior Study) and were asked if they thought their parents and/or grandparents would be interested in participating in the study as well. Undergraduates then referred their interested parents and grandparents for the current study by providing the primary investigator (PI) with contact information (e.g., full name, mailing address, and email address) of their middle-aged and older adult family members. Depending on which psychology course in which they were enrolled, undergraduate students who referred their parents and grandparents for the study were offered either course credit (e.g., homework credit) or extra credit.

The referred middle-aged adults received postcards in the mail describing the purposes of the current study and inviting them to participate in the online survey. The postcard also provided instructions for accessing the study online along with a username and password so they could log in to the SONA system and access the appropriate study (e.g., Health Promoting Behavior Study). Study participation was not timed and lab attendance was not required. Participation in the Health Promoting Behavior Study was contingent upon an online consent form. The online survey described the purposes of the study and allowed for participants to skip any question they did not want to answer. Additionally, participants were allowed to withdraw from the online study at any time. Participants who completed the online study were later mailed a postcard thanking them for their participation.

Eight hundred forty-two participants were contacted to participate through referrals from undergraduate and graduate students at West Virginia University. One hundred sixty-seven adults responded to the recruitment ads that were mailed to them and completed the online study, a 20% return rate. The first part of the online study consisted of the consent form and the demographic questionnaire; part two of the online study consisted of questions that asked about the key study variables of interest. Of the 167, 58 individuals completed only part one of the study. In sum, the final sample consisted of 109 consenting participants. There were no significant demographic differences between the 109 participants and the 58 who did not complete part 2.

Study Sample

The 109 middle-aged adults (men = 33; women = 76) ranged from 40-66 years ($M = 49.94$, $SD = 4.96$) and were primarily White (94.5%); the remainder were African American (1.8%), Asian American (.9%) and Hispanic American (.9%). A majority of participants (87%) were residents of the Northeastern and Mid-Atlantic United States (e.g., West Virginia, Pennsylvania, Maryland, New Jersey, New York, Delaware, and Maine). Using the U.S. Department of Health and Human Service's body mass index categories, a majority of participants were overweight (40.4%), and had a mean body mass index (BMI) of 28.04 (ranging from 19.39 – 43.04). The remainder were normal weight (25.7%) and obese (27.5%). Adults reported experiencing an average of 3.39 chronic health conditions. The most commonly reported health conditions were: difficulty dealing with headaches (41.3%), arthritis (37.6%), back problems (37.6%), and high blood pressure (27.5%). Half had a college degree (50.5%) and 39.4% had a total annual family income of \$100,000 or greater. The remainder had a total income of \$75,000 - \$99,999 (23.9%), \$50,000 - \$74,999 (15.6%), \$25,000 - \$49,999 (13.8%),

and less than \$25,000 (2.8%). Of the 109 participants, 80.7% were married, 11.9% were divorced, 4.6% were remarried after divorce, and .9% was living with a partner. Demographic information for the final sample can be found in Table 1.

Measures

The online study included questionnaires that assessed demographics, chronic health conditions, future time perspective, internal health locus of control, and health promoting behaviors. In addition, items not related to the current study (e.g., positive and negative affect, disordered eating, and eating-related cognitions) were collected so that future associations between other health indexes (e.g., disordered eating) and health promotion could be investigated.

Demographic Information

The demographic questionnaire collected data regarding participants' age, gender, marital status, education, and a variety of health information (e.g., height, weight, over-the-counter medication use, seat belt use, etc.) (see Appendix A).

Chronic Health Conditions

The Health Condition Checklist from the National Long-Term Care Survey (NLTC, 1992) assessed the number and severity of chronic health conditions that individuals reported (see Appendix B). Participants were asked to indicate whether they had been diagnosed with any of the 31 listed conditions and to rate the difficulty each condition causes them from "none" to "severe." Health conditions ranged from potentially fatal (e.g., cancer, heart trouble) to nonfatal (e.g., arthritis, back problems). The Charlson index (see Pompei, Ales & MacKenzie, 1987) is a valid index that assesses risk of death from comorbid disease by calculating the number and severity of comorbid health conditions. Using this index, responses were first coded for presence (1) or absence (0) of each chronic health condition. In order to calculate the severity of each

present chronic health condition, responses were then coded as such: (1) “no difficulty,” (2) “mild difficulty,” (3) moderate difficulty,” and (4) “severe difficulty.” All 31 present chronic health conditions were summed to create an index of current health status, such that higher scores indicate greater difficulty in dealing with chronic health conditions. In other words, the severity index represented individuals’ perceived sense of functional disability that was a result of being diagnosed with a chronic health condition. In the current sample, participants reported having an average of 3.39 chronic health conditions ($SD = 2.36$) and an average severity composite of 6.32 ($SD = 5.73$), indicating that, on average, participants experienced zero or mild difficulty for each of their reported chronic health conditions. The possible severity composite range was from 0 (e.g., reporting no chronic health conditions and no difficulty) to 124 (e.g., reporting all chronic health conditions and severe difficulty). The severity composite range for the current sample was from 0 – 29.

Future Time Perspective

Future Time Perspective (FTP, Lang & Carstensen, 1994) was measured with a 10-item questionnaire that addressed participants’ beliefs about time, opportunities, and goals that may exist in their future. Sample items included statements such as, “Many opportunities await me in the future,” and “As I get older, I begin to experience that time is limited” (see Appendix C). Item responses range from (1) “very untrue” to (7) “very true” and the scale is scored such that higher scores indicate an expansive view of time, whereas lower scores indicate a more limited view of time. In the current sample, a mean score of 48.42 ($SD = 11.94$) ranging from 10 to 70, was obtained, indicating a mid-range or moderately open view of the future. The scale had high internal consistency in previous research ($\alpha = .92$; Lang & Carstensen, 2002) and in the current study ($\alpha = .91$).

Internal Health Locus of Control

The Multidimensional Health Locus of Control Scale (MHLC, Wallston, Wallston, & DeVellis, 1978), a 54-item questionnaire administered in three 18-item forms, addressed individuals' beliefs about whether their health is internally controlled, controlled by others, or are a matter of chance (see Appendix D). The MHLC scale consisted of three dimensions: *internality (IHLC)* (e.g., "The main thing which affects my health is what I do to myself"); *powerful others (PHLC)* (e.g., "Other people play a big part in whether I stay healthy or become sick"); and *chance externality (CHLC)* (e.g., "Luck plays a big part in determining how soon I will recover from an illness"). All items were rated on a 6-point Likert scale ranging from (1) "strongly disagree" to (6) "strongly agree".

Because the proposed model focuses only on internal health locus of control, the current study only utilized the *internality* dimension of the MHLC. Further, Wallston (2005) suggests only using one form (A, B, or C) of the MHLC unless the purpose of the study is to test the validity of the MHLC. In the current study, participants completed the three forms in order (e.g., Form A, Form B, and Form C), thus in order to reduce testing-instrumentation effects, only Form A was included in model testing. Moreover, participants had a strong sense of internal health locus of control over their health, as a mean score of 26.80 (SD = 3.60), on a scale of 6-36, was obtained.

In past research, each of the three subscales (i.e., 6-item internality, 6-item powerful others, and 6-item chance externality within each form) was internally consistent, with Cronbach's alphas ranging from .67 to .77 in previous research (Wallston, et al., 1978) and scores ranging from .64 to .77 in the current study. Moreover, the internality subscale was also

internally consistent, with Cronbach's alphas ranging from .70 to .77 in the current study (e.g., Form A = .70; Form B = .73; Form C = .77).

Health Promoting Behavior

The 52-item Health Promoting Lifestyle Profile II (HPLP II, Walker & Hill-Polerecky, 1996) assessed the frequency and type of health promoting behaviors in which middle-aged adults engaged (see Appendix E). The HPLP II is composed of a total scale and six subscales to measure various dimensions of health promotion. The subscales are defined as follows: *spiritual growth* (9 items) (e.g., "Believe that my life has purpose"); *interpersonal relations* (9 items) (e.g., "Discuss my problems and concerns with people close to me"); *nutrition* (9 items) (e.g., "Choose a diet low in fat, saturated fat, and cholesterol"); *physical activity* (8 items) (e.g., "Follow a planned exercise program"); *health responsibility* (9 items) (e.g., "Report any unusual signs or symptoms to a physician or other health professional"); and *stress management* (8 items) (e.g., "Take some time for relaxation each day"). Participants were asked to indicate the frequency with which they engaged in each behavior ranging from (1) "never" to (4) "routinely" and the scale is scored such that higher scores indicate more engagement in health promotion, whereas lower scores indicate less engagement in health promotion. In the current study, a mean health promotion score of 137.12 (SD = 22.95), on a scale from 52- 208, was obtained, indicating that participants engaged in a moderate amount of health promotion.

The overall scale has been shown to be internally consistent ($\alpha = .94$) in previous research (Walker & Hill-Polerecky, 1996) with alpha coefficients for the six subscales ranging from .79 to .87 (Becker & Arnold, 2004; Walker, Volka, Sechrist, & Pender, 1988). In past research, construct validity was supported through convergence with the Personal Lifestyle Questionnaire ($r = .68$), criterion related validity was reported for concurrent measures of

perceived health status and quality of life ($r = .27$ to $.49$) and the 3-week test-retest reliability coefficient for the overall scale was $.89$ (Becker & Arnold, 2004; Walker & Hill-Polerecky, 1996). In the current study, the overall scale was internally consistent ($\alpha = .94$); with alphas ranging from $.75$ to $.86$ for the six subscales.

Results

Data Management

Missing Data

Five participants (4.6%) had missing data on one or more questions within the Health Promoting Lifestyle Profile II Questionnaire. Participants elected to not answer these questions by checking a box during the online Sona survey that stated “check this box if you do not wish to provide an answer for this question.” Widaman (2005) suggests that for item nonresponse, the mean of completed values within that scale for that individual can be substituted because information from that particular subject is still being utilized (i.e., individual mean substitution). As a result, if participants were missing a single item on a given scale, their item mean was used in scale construction. There were no missing data within the other variables of interest.

Outliers

Prior to analyses, data were inspected for outliers. Outliers were defined as values that fell outside the whiskers of a box plot (Howell, 2002). Values that were identified as outliers were recoded so they were along the whiskers but still on the ends of the distribution. Four values were recoded: two high values for health promoting behavior, one low value for health promoting behavior, and one low value for future time perspective.

Normality

The distribution of scale scores were examined for normality using skewness and kurtosis values. A distribution was considered significantly skewed if the skew or kurtosis z-score value (e.g., value of skew or kurtosis divided by their standard errors) was greater than 1.96 (Field, 2005). Using this criterion, all of the scales were normally distributed, thus no data transformations were necessary.

Preliminary Analyses

Descriptive Information

Descriptive statistics (e.g., mean, standard deviation) for all variables of interest can be found in Table 2. All measures of interest (e.g., future time perspective, internal health locus of control, and health promotion) used a Likert-type scale (e.g., unidimensional scaling), indicating interval level data, thus scale sums were used. Participants had, on average, a chronic condition severity composite of 6.32 ($SD = 5.73$) and an average of 3.39 ($SD = 2.35$) chronic health conditions, indicating they perceived zero to mild functional impairment as a result of each of their reported chronic health conditions. Participants saw their future time as mid-range (i.e., neither limited nor unlimited) ($M = 48.42$, $SD = 11.94$) and had a strong sense of internal health locus of control over their health, as a mean score of 26.80 ($SD = 3.60$) was obtained. Moreover, a total mean health promotion score of 137.12 ($SD = 22.95$) indicated that participants engaged in few to moderate health promoting behaviors.

Bivariate Correlations

To determine how the key variables were related, bivariate correlations were examined. Significant correlations between variables provided preliminary support for the hypothesized associations within the path model. Specifically, both age ($r = -.21$) and adults' perceptions of their functional limitations ($r = -.30$) were significantly associated with future time perspective.

Older middle-aged adults were more likely to have a limited future time perspective. Further, the greater the severity of chronic health conditions middle-aged adults perceived, the more likely they were to report having a limited future time perspective. In addition, both future time perspective and internal health locus of control were significantly associated with engagement in health promotion. For example, middle-aged adults with an open-ended future time perspective were more likely to report engagement in health promotion ($r = .47$). Additionally, middle-aged adults who reported having a stronger internal sense of control over their health were more likely to report engagement in health promotion ($r = .31$). Table 3 includes the correlation matrix for all variables. For continuous variables, Pearson coefficients are reported; for dichotomous variables, Spearman's rho is reported. For ease of interpretation, gender was coded such that men = 1 and women = 2.

Intraclass Correlation

Because twenty-one participants also had their spouse participate in the current study, an intraclass correlation coefficient was calculated to determine agreement between spouses (e.g., 21 dyads). The intraclass correlation coefficient was weak, 0.06 (e.g., Howell, 2002, suggests non independence exists if coefficients are close to 1.00), indicating that data could be considered to be independent.

Analytical Approach: Path Analysis

Hypothesis and Model Testing

In addition to the overall fit of the data to the model, each path in Figure 1 represents a specific hypothesis. As seen in Figure 1, age was expected to exert direct effects on health promoting behaviors (H1) and indirect effects via its association with future time perspective (H2) and internal health locus of control (H3). Gender was expected to exert direct effects on

health promoting behaviors (H4) and indirect effects through its association with internal health locus of control (H5). The severity of chronic health conditions was expected to exert indirect effects on health promoting behaviors via its association with future time perspective (H6) and internal health locus of control (H7). Lastly, both future time perspective (H8) and internal health locus of control (H9) were expected to exert direct effects on health promoting behavior.

By utilizing path analyses, all paths (both hypothesized and non-hypothesized) were tested simultaneously, and each path was examined for significance. To assess whether each path was significant, the standardized maximum likelihood estimates (MLE) were inspected. The MLEs were similar to regression coefficients representing the linear influence of common factors on measured variables (Byrne, 2001; Kline, 2005). Statistical significance for each path was determined by examining the Critical Ratio (CR); CR values greater than 1.96 were interpreted as significant at the $p < .05$ level. Moreover, standardized Betas, β , provided information on the strength of the predictors in the model and indicated the number of standard deviation units the outcome variable would change if the predictor variable changed by one standard deviation (see Byrne, 2001; Kline, 2005).

Planned model revisions included: (1) examining and dropping the non-hypothesized paths based on low MLE values and (2) inspecting the modification indices, which suggest specific paths that can be added to the model in order to improve model fit. After dropping the non-hypothesized paths from the model one at a time, the fit of the data to the model was re-analyzed.

How well the observed data fit the estimated model was determined by inspecting a number of goodness-of-fit statistics. First, a chi-square statistic was used to determine whether the observed data differ from the hypothesized model. A non-significant chi-square indicated

that the observed model accurately reflected the estimated model. Because the chi-square statistic has significant limitations in model testing (e.g., strongly influenced by sample size and degrees of freedom), a number of goodness-of-fit indices have been developed to better judge the degree of fit between the observed and estimated models (Byrne, 2001). The alternative fit indices used in the current study were the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA). Good model fit was indicated if the CFI was greater than .90 and the TLI was greater than .90 (Kline, 2005). Moreover, model fit was considered acceptable when RMSEA values were less than .08 and was considered a good fit when values were less than .05 (Byrne, 2001).

Preliminary Model

With the inclusion of paths hypothesized to be non-significant, the tested model (11 tested paths, see Figure 2), resulted in low fit indices and thus indicated a poor fit of the data to the model, χ^2 (df = 4; N = 109) = 12.447, $p < .05$, CFI = .855, TLI = .458, RMSEA = .140. The baseline model also explained a substantial amount of the variance in the dependent variable, health promotion ($R^2 = .329$). Upon inspection of the MLEs and CR values for each of the 11 paths, model modification started by examining (and later dropping) the non-significant, non-hypothesized paths. The non-hypothesized, non-significant tested path from gender to future time perspective (CR = .136, $p = .892$) was dropped first from the model because of its low MLE value (.01) and model fit was reanalyzed (see Table 4 for a list of the CR values, SE estimates, and the unstandardized and standardized betas for the preliminary and hypothesized models; see Table 5 for a list of goodness-of-fit statistics for the preliminary and hypothesized models). Modification indices provided no suggestions.

For the second tested model, the first non-hypothesized, non-significant path (from gender to future time perspective) had been dropped. Model fit indices suggested some improvement, however the data again fit the model poorly, χ^2 (df = 5; N = 109) = 12.465, $p < .05$, CFI = .872, TLI = .617, RMSEA = .118. Like the first model, the second model also explained a substantial amount of the variance in health promotion ($R^2 = .327$). After inspection of the MLEs and CR values for each of the ten remaining paths, the second non-hypothesized, non-significant path, (tested path from chronic health conditions to health promotion) (CR = -1.162, $p = .245$) was dropped from the model and model fit was reanalyzed. Again, modification indices provided no suggestions.

Hypothesized Model

Having determined that the two non-hypothesized paths were non-significant, model testing of the hypothesized model began. Results indicated a poor fit of the data to the model, χ^2 (df = 6; N = 109) = 13.791, $p = <.05$, CFI = .867, TLI = .667, RMSEA = .110. Despite the poor fit, the hypothesized model explained a substantial amount of the variance in health promotion ($R^2 = .318$).

Although none of the indices (e.g., χ^2 , CFI, TFI, and RMSEA) suggested a good fit of the data to the model, standardized Beta weights for several paths suggested support for five of the nine hypothesized paths. First, hypothesis H2 was supported, as age was negatively associated with future time perspective ($\beta = -0.19$). In addition, hypothesis H4 was supported ($\beta = 0.20$), as gender was associated with health promotion. Third, hypothesis H6 was supported ($\beta = -0.29$), as chronic health condition severity was negatively associated with future time perspective. Fourth, hypothesis H8 was supported ($\beta = 0.47$), as future time perspective was positively associated with health promotion. Next, hypothesis H9 supported ($\beta = 0.21$), as internal health locus of

control was positively associated with health promotion. Lastly, although hypothesis H1 was not supported (the hypothesized association was in the opposite direction), the path emerged as significant, ($\beta = 0.23$), as age was positively associated with health promotion.

Exploratory Analyses

Health Promotion Domains. The outcome variable in the previously tested models was a total sum (e.g., collapsing across health promoting subscales) from the Health Promotion Lifestyle Profile II. To assess model fit for each of the six health promotion subscales (e.g., health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations, and stress management), model fit was re-analyzed using each subscale as the outcome variable.

For the *health responsibility* subscale, results indicated a poor fit of the data to the model, χ^2 (df = 6; N = 109) = 14.864, $p < .05$, CFI = .725, TLI = .311, RMSEA = .117. Despite the poor fit, the model explained a moderate amount of the variance in health responsibility ($R^2 = .156$). Standardized Beta weights for several paths suggested support for five of the nine paths. Age was negatively associated with future time perspective ($\beta = -.19$); health condition severity was negatively associated with future time perspective ($\beta = -.29$); gender was associated with health responsibility ($\beta = 0.25$); age was associated with health responsibility ($\beta = 0.20$); and future time perspective was positively associated with health responsibility ($\beta = 0.26$).

For *physical activity*, results indicated a poor fit of the data to the model, χ^2 (df = 6; N = 109) = 15.999, $p < .05$, CFI = .712, TLI = .280, RMSEA = .124. In addition, the model explained a moderate amount of the variance in engagement in physical activity ($R^2 = .142$). Standardized Beta weights for several paths suggested support for four of the nine paths. Age was negatively associated with future time perspective ($\beta = -.19$); health condition severity was negatively associated with future time perspective ($\beta = -.29$); future time perspective was

positively associated with physical activity ($\beta = 0.26$); and internal health locus of control was positively associated with physical activity ($\beta = 0.22$).

For *nutrition*, results indicated a poor fit of the data to the model, χ^2 (df = 6;N = 109) = 14.811, $p = < .05$), CFI = .819, TLI = .547, RMSEA = .117. Despite the poor fit, the model explained a moderate amount of the variance in nutrition ($R^2 = .246$). Standardized Beta weights for several paths suggested support for five of the nine paths. Age was negatively associated with future time perspective ($\beta = -.19$); health condition severity was negatively associated with future time perspective ($\beta = -.29$); gender was associated with nutrition ($\beta = 0.27$); future time perspective was positively associated with nutrition ($\beta = 0.38$); and internal health locus of control was positively associated with nutrition ($\beta = 0.17$).

For *spiritual growth*, results indicated a poor fit of the data to the model, χ^2 (df = 6;N = 109) = 13.884 $p = < .05$), CFI = .898, TLI = .746, RMSEA = .110. Despite the poor fit, the model explained a substantial amount of the variance in spiritual growth ($R^2 = .432$). Standardized Beta weights for several paths suggested support for six of the nine paths. Age was negatively associated with future time perspective ($\beta = -.19$); health condition severity was negatively associated with future time perspective ($\beta = -.29$); gender was associated with spiritual growth ($\beta = .16$); age was positively associated with spiritual growth ($\beta = .37$); future time perspective was positively associated with spiritual growth ($\beta = .57$); and internal health locus of control was positively associated with spiritual growth ($\beta = .19$).

For *interpersonal relations*, results indicated a poor fit of the data to the model, χ^2 (df = 6;N = 109) = 14.539 $p = < .05$), CFI = .822, TLI = .556, RMSEA = .115. Despite the poor fit, the model explained a moderate amount of the variance in interpersonal relations ($R^2 = .255$). Standardized Beta weights for several paths suggested support for five of the nine paths. Age

was negatively associated with future time perspective ($\beta = -.19$); health condition severity was negatively associated with future time perspective ($\beta = -.29$); gender was associated with interpersonal relations ($\beta = .25$); age was positively associated with interpersonal relations ($\beta = .19$); and future time perspective was positively associated with interpersonal relations ($\beta = .40$).

For *stress management*, results indicated a poor fit of the data to the model, χ^2 ($df = 6; N = 109$) = 12.571 $p = .05$, CFI = .803, TLI = .507, RMSEA = .101. In addition, the model explained a small amount of the variance in stress management ($R^2 = .172$). Standardized Beta weights for several paths suggested support for six of the nine paths. Age was negatively associated with future time perspective ($\beta = -.19$); health condition severity was negatively associated with future time perspective ($\beta = -.29$); gender was associated with stress management ($\beta = .21$); age was positively associated with stress management ($\beta = .23$); future time perspective was positively associated with stress management ($\beta = .25$); and internal health locus of control was positively associated with stress management ($\beta = .19$).

Multiple Regression. Because the data fit the test model poorly, a hierarchical regression was conducted to evaluate whether the psychological constructs were able to predict health promotion over and above the demographic variables. Demographic variables (e.g., age, gender, perceived chronic health condition severity) were entered in the first step as control variables (i.e., covariates) because based on previous research (see Callahan, 2005; George, 2001; Nelson et al., 2007; Prohaska et al., 2005) they were considered known predictors of health promotion. In the second step, internal health locus of control and future time perspective were entered. Hierarchical regression models allow researchers to determine the change in R-squared values

between steps, which indicate whether the additional variance accounted for by the variables in each successive step is significantly different than zero.

Results indicated that in the first model (e.g., step 1), age, gender, and perceived chronic health condition severity accounted for a significant amount of the variance in health promotion, $R^2 = .10$, $F(3, 105) = 3.68$, $p < .01$, indicating that older women who perceived fewer functional limitations were more likely to engage in health promotion. In the second model, internal health locus of control and future time perspective accounted for a significant proportion of health promotion variance after controlling for the effects of age, gender, and perceived chronic health condition severity, R^2 change = .25, $F(2, 103) = 19.69$, $p < .01$ (see Table 6 for a list of the regression coefficients). In other words, the addition of the psychological constructs (e.g., internal health locus of control and future time perspective) caused R^2 to increase by 0.25. The second model, which included all five predictors, had a significantly larger F ratio (19.69, $p < .01$) than the initial model (3.68), indicating that the second model was better able to predict engagement in health promotion.

Four of the five predictors made significant contributions to the regression equation in the second model: age, $t(103) = 2.66$, $p < .01$; gender, $t(103) = 2.42$, $p < .01$; future time perspective, $t(103) = 4.94$, $p < .01$; and internal health locus of control $t(103) = 2.68$, $p < .01$. Overall, these results suggest that when demographic variables were held constant (i.e., similar perceived chronic health condition severities and similar in age), adults were more likely to engage in health promotion if they had a greater sense of internal health locus of control and a more open-ended future time perspective.

Discussion

Review of Research Objectives

The purpose of the current study was to examine factors that influenced engagement in health promotion in a sample of middle-aged community dwelling adults. Specifically, the study had two primary research objectives. The first objective was to examine the relations between demographic variables (e.g., age, gender, and chronic health condition severity), future time perspective, internal health locus of control, and health promotion. The second objective focused on how well future time perspective and health locus of control predicted engagement in health promotion.

Review of Study Findings

The following section provides a summary of the current study's major findings. In the first section, major findings related to first research objective are highlighted: (a) the associations among age and health promotion, age and future time perspective, and age and internal health locus of control, (b) the associations among gender and health promotion, and gender and internal health locus of control, (c) the associations among chronic health condition severity and future time perspective and chronic health condition severity and internal health locus of control. In the second section, findings related to the second research objective are discussed: (a) the influence of future time perspective on engagement in health promotion and (b) the influence of internal health locus of control on engagement health promotion. The first research question, which addressed both objectives of the study, consisted of nine hypotheses. Each of these hypotheses and whether they were supported will be discussed below.

Overall Fit of the Model. The subsequent discussion focuses on the third, hypothesized model (see Figure 3). Although the data fit the model poorly, the hypothesized model provided support for five of the nine hypotheses. More specifically, age influenced future time perspective (H2), gender influenced health promoting behaviors (H4); the severity of chronic health

conditions was associated with future time perspective (H6); future time perspective directly influenced health promotion (H8); and internal health locus of control directly influenced health promotion (H9). Lastly, the hypothesized model accounted for a substantial amount of the variance in health promotion (i.e., 30%).

The Influence of Age on Health Promotion

Hypothesis H1, that age would be associated with adults' participation in health promotion was supported by the model but emerged in the opposite direction than was hypothesized. Research has consistently noted that participation in physical activity (i.e., a specific health promoting behavior) declines with age and older adults are more likely to have an inactive lifestyle when compared to middle-aged and younger adults (Nelson, 2007; Prohaska et al., 2006; Schutzer & Graves, 2004); thus it was hypothesized that older middle-aged adults would engage in less health promoting behaviors than younger middle-aged adults. However, results indicated a positive association between age and health promotion, where older middle-aged adults engaged in more health promoting behaviors than younger middle-aged adults.

Such a finding is of interest for several reasons. First, health promotion research typically focuses solely on participation in physical activity or exercise, namely because it decreases one's susceptibility to disease and illness and prevents the onset of numerous chronic health conditions (e.g., cardiovascular disease). Findings from the current study suggest that although participation in physical activity may decrease with age due to physical limitations (e.g., arthritis) older middle-aged adults may be choosing to participate in other forms of health promotion (e.g., stress management behaviors). Secondly, even though adults may start to recognize their physical health declines early in midlife (Merrill & Verbrugge, 1999) and realize the importance of health promoting behaviors, perhaps they are not choosing to adopt these

behaviors until they approach the transition into old age, when issues related to illness become more salient (Becker & Arnold, 2004).

Further, because of the current obesity epidemic that exists in Western cultures (see Swinburn et al., 1999) more health care professionals are stressing the importance of prevention and early detection of chronic diseases (Schutzer & Graves, 2004). As a result, perhaps more adults, regardless of age, are becoming increasingly aware of the importance of health promotion.

The Influence of Age on Future Time Perspective

Hypothesis H2, that age would be associated with future time perspective was supported by the model. Specifically, younger middle-aged adults had a significantly more expansive view of the future than older middle-aged adults, who had a more limited future perspective. Little research has explored future time perspective at midlife (Cate & John, 2007). Researchers assert that midlife is a time when adults recognize physical declines and are thus reminded of their remaining time to live, which should consequently influence their future time perspective and how many opportunities they feel are available to them in the future (Cate & John). In other words, as adults become aware of their declining bodies during midlife, their future time perspective becomes limited.

Previous research (Lang & Carstensen, 2002), suggests midlife is a time for adults to prioritize family and career goals and thus see their future filled with opportunities and as a result, are more likely to have an expansive view of their future in order to fulfill their family and career goals. However, the current finding may also support previous researchers assumptions (Cate & John, 2007) that midlife is indicative of two concurrent views of future time perspective, with the entrance to midlife signifying a perspective full of opportunities and the exit to midlife signifying a perspective with many limitations. However, longitudinal data is necessary to test this

assumption. Further, although Löckenhoff and Carstensen (2004) propose that age does not directly influence future time perspective, increasing age is associated with declines in objective physical health, which may directly influence adult's perceptions about their future time.

The Influence of Age on Internal Health Locus of Control

Hypothesis H3, that older middle-aged adults would have a lower sense of internal control over their health than younger middle-aged adults was not supported. Previous research has asserted that control beliefs decrease with age (Lachman, 2006; Lachman & Firth, 2004) and although control beliefs are expected to vary by domain in midlife (e.g., increased sense of control in the work domain, decreased sense of control in the child caregiving domain), health related control is assumed to decrease with age (Lachman & Weaver, 1998a). Likewise, other research suggests that middle-aged adults typically have a greater sense of internal health locus of control when compared to older adults (Lachman & Firth).

The nonsignificant finding is in accord with findings from Lachman and Weaver (1998a) who suggests that internal health locus of control does not vary by age because healthcare professionals and health campaigns are more proactive in encouraging individuals (regardless of age) to take a larger role in controlling their health. In addition, most Americans believe they can do something to slow their aging process; a belief that is certainly derived from the ubiquitous presence of anti-aging campaigns in western culture (Lachman, 2006; Saucier, 2004). Lastly, the non-significant finding between age and internal health locus may only be generalizable to the Baby Boom cohort. The baby boomers are typically described as competent and knowledgeable, and researchers assume they aspire to optimize the aging process (Lachman 2004); as a consequence, one may expect to find high internal locus of control beliefs in such a sample.

The Influence of Gender on Health Promotion

Hypothesis H4, that gender would be associated with engagement in health promotion when compared to men was supported by the model. Specifically, women engaged in significantly more health promoting behaviors when compared to men. Although there is an profusion of research to suggest women low participation in physical activity when compared to men (e.g., Hageman, et al., 2005; Rimer, et al., 2001; Seger, et al., 2006) there is some research to suggest that women engage in a wider variety of health promotion behaviors when compared to men. For example, George (2001) reports that women are more likely than men to report their physical and emotional health symptoms to others and are more likely to seek medical care. Furthermore, because women are more likely to talk to health care professionals about their health and are better able to respond to changes in their health status, they are more likely to engage in a variety of health promoting behaviors. Additionally, Callaghan (2005) reports that women have greater self-efficacy beliefs when it comes to self-care practices and thus are more likely to engage in health promotion, when compared to men. Bandura (2004) likewise asserts the importance of self-efficacy in initiating health promotion practices.

This finding is important because it suggests that women are better able to manage their health as they proceed through midlife, when recognizing and responding to physical declines becomes a salient issue (Lachman, 2004). Such a finding may help explain why women's life expectancy is, on average, six years longer than men (Department of Health and Human Services, 2000).

The Influence of Gender on Internal Health Locus of Control

Hypothesis H5, that men would be more likely to have a greater internal sense of control over their health when compared to women was not supported. Previous research, however, has supported the influence of gender on internal health locus of control. For example, results from

the MIDUS survey suggest that middle-aged men have greater sense of global internal control when compared to middle-aged women. Moreover, in the health domain, women were more likely to have external locus of control than men. Specifically, women felt their health status was influenced more by their physician than their own behaviors (Lachman & Firth, 2005).

Control beliefs are often examined by domain and during midlife, internal control beliefs often increase in the work and marriage domain but decrease in the child and sex domain (Lachman & Firth, 2005). Perhaps, the health domain is a multidimensional construct, where men and women differ in some health domains (e.g., physical activity) but not others (e.g., spiritual growth) and collapsing across health domains (e.g., physical activity, spiritual growth, interpersonal relations) does not allow for the detection of such differences.

The Influence of Perceived Functional Limitation on Future Time Perspective

Hypothesis H6, that middle-aged adults' perceived functional limitation due to their chronic health conditions would be associated with their future time perspective was supported by the model. Specifically, the more difficulty that middle-aged adults perceived their chronic health conditions to be causing, the more limited their future time perspective. In other words, healthier adults (e.g., zero or less severe chronic health conditions) were more likely to perceive their future time as expansive when compared to middle-aged adults who perceived their health conditions to be more severely inhibiting their daily functioning. This is in line with previous research (Carstensen & Frederick, 1998) that demonstrated that both younger and older adults who were HIV positive had similar future time perspectives; in particular, all HIV positive adults, regardless of age, saw fewer opportunities in the future. Other research is in accord with this finding; Zanjani and colleagues (2006) assert that having a chronic health condition influences

individuals' perceived vulnerability to disease and illness, which may consequently influence future time perspective.

This finding is of interest because it highlights the importance of how individuals' health status (e.g., being diagnosed with a chronic health) can significantly influence their perception of their future. Age may not be the sole predictor of future time perspective. Being diagnosed with a chronic health condition may serve as a stark reminder for adults' perceptions of how many opportunities they feel will be available to them in the future.

Furthermore, how individuals perceive their future time influences the types of goals people choose for themselves (Lang & Carstensen, 2002). For example, individuals with few functional limitations due to their chronic health conditions may be more likely to have an expansive view and will choose goals that optimize the future (e.g., adherence to exercise programs) and will consequently engage in health promotion (Löckenhoff & Carstensen, 2007). However, currently 49 million Americans live with a chronic disease (Stuifbergen, 2006) and, although incidence rates increase with age (Piazza et al., 2007) it is estimated that the onset of such diseases will start to emerge at younger ages because of the current obesity epidemic. As a result, numerous adults may be diagnosed with a chronic health condition earlier in life and may be less likely to prioritize goals that optimize the future because they perceive their future time as limited.

The Influence of Perceived Functional Limitation on Internal Health Locus of Control

Hypothesis H7, that middle-aged adults who perceived less severe functional limitations would have a greater internal sense of control over their health when compared to middle-aged adults who perceived more severe functional limitations was not supported. Results from Lachman and Weaver (1998a) suggest a negative association between chronic health conditions

and internal health locus of control beliefs. The more chronic health conditions middle-aged adults reported experiencing, the less control they felt they had over their health. The non-significant finding is of interest because it suggests that adults' perceived chronic health condition severity may not be an important predictor of control beliefs; the number of reported health conditions may simply warrant sufficient power in influencing individual's internal health locus of control beliefs.

The Influence of Future Time Perspective on Health Promotion

Hypothesis H8, that middle-aged adults' future time perspective would be associated with health promotion was supported by the model. Specifically, middle-aged adults who perceived their future as relatively open-ended engaged in more health promoting behaviors than middle-aged adults who perceived their future time as limited. Although research on the association between future time perspective and health promotion is scarce, this finding is in accord with researchers who suggest that individuals' behaviors are influenced by their goals, which are strongly influenced by future time perspective (Löckenhoff & Carstensen, 2004). More specifically, individuals who viewed their future as relatively open with opportunities, chose goals (hypothetically) that optimized their future, and consequently, engaged in more health promotion.

In the health domain, Löckenhoff and Carstensen (2004) suggest that when middle-aged adults who view their future time as open ended and thus full of opportunities, goals aimed at optimizing the aging process are prioritized and adults are more likely to engage in health promoting behaviors such as seeking out health information from their doctor and adhering to a physical activity regimen. The significant finding likewise supports this idea. Moreover, middle-aged adults who view their future as limited do not prioritize goals aimed at optimizing the future.

Instead, these adults are more concerned with deriving an emotional meaning from life (Cate & John, 2007), are less concerned with health promotion and thus prioritize emotionally meaningful goals (e.g., avoid negative interactions with primary care physician, seek out emotional interactions).

The Influence of Internal Health Locus of Control on Health Promotion

Hypothesis H9, that middle-aged adults who had a stronger internal sense of control would more likely engage in more health promoting behaviors when compared to middle-aged adults who had a weaker internal sense of control was supported by the model. Specifically, middle-aged adults who had a greater internal sense of control over their health were more likely to engage in health promoting behaviors. This finding is in accord with past research that suggests that those who believe they can control their health outcomes are more likely to experience greater well-being because they are more likely to engage in healthy promotion (Lachman & Firth, 2004; Ziff et al., 1995), experience fewer chronic illnesses, and report better self-rated health (Lachman, 2006). Additionally, these findings may also lend support to the assumption that midlife is a time of increased power and control, regardless of the domain of interest (Clark-Plaskie & Lachman, 1999).

Researchers assert that maintaining a high internal sense of control is imperative for successful aging because it allows for adults to overcome the negative experiences that are typically associated with the aging process (Lachman & Firth, 2004). As a result, maintaining a high sense of internal control becomes important in midlife, when adults start to experience the physical changes that emerge during this developmental period. In other words, a high internal sense of control may act as a buffer during midlife (Lachman & Firth), because it allows for adults to persevere and deal with the multiple social roles and responsibilities that middle-aged

adults are assumed to be balancing in the while concurrently experiencing the physical and psychological changes that accompany aging (Lachman, 2004).

Summary

The current study suggests that the tested data fit the hypothesized model poorly, even though six of the nine paths were supported. Exploratory model revisions indicated that model fit was considered satisfactory only when the three non-significant paths hypothesized to be associated with internal health locus of control were dropped from the model (see Table 5).

When examining the two psychological constructs, future time perspective and internal health locus of control, engagement in health promoting behaviors was more strongly influenced by future time perspective ($\beta = .47$) than internal health locus of control ($\beta = .21$). As a result, future time perspective may be a useful construct to include in health intervention research if researchers are attempting to understand the underlying mechanisms of health behavior change. However, whether it is useful to intervene with future time perspective remains unclear because it is uncertain whether health practitioners can alter one's future time perspective with intervention techniques.

Because future time perspective and internal health locus of control did not emerge as significant mediators in explaining the relation between demographic variables and engagement in health promotion in the tested path analysis, a hierarchical regression was conducted to further investigate the association among psychological constructs and health promotion. Engagement in health promotion was best predicted when both future time perspective and internal health locus of control were included with demographics in model testing. In addition, both constructs significantly contributed to the regression equation. Furthermore, about 70 percent of the variability in health promotion was attributable to the effects of the two psychological constructs

and only 30 percent of the variability in health promotion was attributable to the effects of age, gender, and perceived functional limitations. Results suggest that although older women who perceive fewer functional limitations are more likely to engage in health promotion, psychological variables predict health promotion above and beyond demographics. More specifically, adults who had a greater internal health locus of control and a more open-ended view of their future were more likely to engage in health promoting behaviors than adults with lesser internal health locus of control and limited view of their future.

Also of interest were the three non-significant relations that were hypothesized to be associated with internal health locus of control (H3, H5, and H7). These non-significant paths warrant attention, though, because they may lend support for the need to consider internal health locus of control as a person variable (e.g., personality characteristic) that is stable and not necessarily as an outcome variables that is associated with other demographic variables (e.g., age, gender, health condition status).

The results suggest that an intervention designed to increase health promotion might prove successful if future time perspective is incorporated into model testing. More specifically, the model indicated that future time perspective was directly associated with health promotion as middle-aged adults who perceived their future as unlimited engaged in more health promoting behaviors. In addition, age and chronic health condition severity were indirectly associated with health promotion through their association with future time perspective such that younger middle-aged adults and those with less severe chronic health conditions had a more expansive view of their future. Because midlife is a time when physical declines start to emerge, and health condition severity emerged significantly associated with future time perspective, knowing participants' health status seems important in informing future intervention work.

Domains of Health Promotion

Because there is research to suggest that engagement in health promotion varies by domain (e.g., physical activity, nutrition) (Zanjani et al., 2006), and internal locus of control beliefs vary by domain (Lachman & Firth, 2005) of interest was whether model fit varied across the six health promotion subscales of the HPLP II (e.g., physical activity, nutrition, health responsibility, interpersonal relations, stress management, and spiritual growth). Although the data fit each of the models poorly, several of the paths emerged significant within each health promotion domain.

For all six tested models, age negatively influenced future time perspective; older middle-aged adults saw their future as limited compared to younger middle-aged adults, who viewed their future as unlimited. Moreover, the severity of chronic health conditions negatively influenced future time perspective; middle-aged adults who were experiencing more severe chronic illnesses reported having a more limited view of their future than middle-aged adults who were experiencing less severe chronic illness.

Interestingly, future time perspective was positively associated with engagement in each of the six health promotion domains. Middle-aged adults who had an expansive view of their future, and thus hypothetically interested in optimizing their aging process (Löckenhoff & Carstensen, 2004), were more likely to engage in health responsibility behaviors, physical activity, nutrition behaviors, spiritual growth behaviors, interpersonal relation behaviors, and stress management techniques. Internal health locus of control was associated with engagement in four of the six health promotion domains (e.g., physical activity, nutrition, spiritual growth, and stress management). Moreover, inspection of the standardized beta weights for each health

promotion domain indicated that future time perspective was more strongly associated with the health outcomes ($\beta = .25$ to $.57$) than internal health locus of control ($\beta = .17$ to $.22$).

Lastly, the influence of age and gender on health promotion varied by domain. Consistent with previous research, when compared to men, women were more likely to engage in each domain of health promotion except physical activity. Age influenced participation in four health promotion domains, such that older middle-aged adults were more likely to engage in health responsibility behaviors, spiritual growth behaviors, interpersonal relation behaviors, and stress management techniques when compared to younger middle-aged adults. Age did not influence participation in physical activity or nutrition behaviors.

These findings suggest that midlife is a time when adult's perceptions of how many opportunities await for them in the future strongly influences their decision to engage in health promoting behaviors. Because midlife is a time when physical declines start to emerge and adults are reminded of the negative consequences associated with the aging process (Lachman, 2004, Merrill & Verbrugge, 1999), perhaps the emergence of such declines triggers stress that strongly influences middle-aged adults' future time perspective. Thus, researchers should consider using socioemotional selectivity theory and future time perspective as a conceptual framework for future work aimed at increasing health promoting behaviors at midlife.

Limitations and Future Directions

The findings from the current study add to the small, yet growing literature of midlife development regarding the importance of considering psychological constructs when examining engagement in health promotion. However, a number of limitations must be considered when interpreting the results and possible opportunities for future research.

Sampling

It is possible that the current study would not be replicable in a more diverse sample of middle-aged adults. First, the participants were quite affluent and high functioning; over 70 % reported earning a college degree (22% of those earning graduate degree) and over 60% reported a total income of over \$75,000 (40% reported an income greater than \$100,000). Secondly, 95% of the sample was White, which limits the generalizability to other ethnic or racial groups. Because a majority of the participants were residents of Northeastern and Mid-Atlantic regions, the current findings may not generalize to other regions in the United States. Additionally, out of 842 middle-aged adults who were contacted to participate in the study, only 167 participants responded to the recruitment postcards. Thus, data on non-responders were not available and the sample in the current study may have been biased such that those who were more educated and had more resources were more likely to respond to the recruitment ads and participate in the study. Moreover, the title of the online SONA survey, “Health Promoting Behavior Study” may have increased selection bias. In other words, perhaps participants who engaged in healthy lifestyles were more likely to choose and participate in the Health Promoting Behavior Study because it was attractive and seemed relevant to them when compared to less healthy participants.

Future research should attempt to replicate the tested model in a more diverse sample of middle-aged adults. For example, there is a growing body of literature that examines health promotion (typically physical activity behaviors) in samples of adults who are experiencing a specific chronic health condition (e.g., breast cancer diagnosis, heart attack episode). Little research examines how comorbidity may influence engagement in health promotion. Perhaps the model could better inform health condition specific health interventions by testing the model with samples of middle-aged adults with specific chronic health conditions.

Measurement

Another limitation of the current study was related to measurement issues. All of the measures were self-report measures. Although all of the selected measures were carefully selected based on previous research; in general, a number of limitations are associated with self-report measures. For example, there is an over-reliance on episodic recall, closed-ended items often force people into choosing an alternative even if they feel the best answer is not included, and, lastly, participants are more likely to overly report social desirable behaviors (e.g., I frequently engage in regular exercise) when answering self-report items (Krosnick, 1999; Schwarz, 1999).

Because it is important to validate self-report data on objective measures of the same construct, future research should address these shortcomings by including multiple measurement techniques. With respect to the construct of health promotion, there are a number of objective measures of physical activity (e.g., accelerometers) that are being widely implemented in health promotion research.

Study Design

Given the cross-sectional nature of the data in the current study, the typical caveat must be acknowledged. Cross-sectional data are limited to group averages and do not allow for the examination of intraindividual changes or causal interpretations. Thus, within the current study's path analysis framework, causal links could not be determined, only estimated conclusions regarding development could be made (Baltes, Reese, & Nessleroad, 1998).

In order to fully understand how adults enter midlife and progress until old age, future research must utilize longitudinal methods. For example, longitudinal data could help explain how changes in psychological constructs over time influence variability in health promotion. As

previously mentioned, cohort effects may be present; thus future research that implements a cross-sequential design, could clarify the presence of these effects.

Conclusion

The current study addressed the importance of considering personal and psychological factors in the study of health promotion at midlife. The first objective examined the relations the relations among demographic variables (e.g., age, gender, and severity of chronic health conditions), future time perspective, internal health locus of control, and engagement in health promoting behaviors. Results indicated that age and gender were associated with engagement in health promotion. Moreover, age and chronic health condition severity were associated with future time perspective. Additionally, the influence of age and gender varied depending on the health domain of interest. Age and gender both influenced engagement in health responsibility behaviors, spiritual growth, interpersonal relations, and stress management techniques.

The second objective focused on how well future time perspective and health locus of control were associated with engagement in health promotion. Results indicated that both psychological constructs significantly influenced engagement in health promotion. In addition, future time perspective significantly influenced middle-aged adults' engagement in each of the six health promotion domains; internal health locus of control influenced engagement in four of the six health promotion domains. Moreover, exploratory results suggest that when demographic variables are held constant, middle-aged adults are more likely to participate in health promotion if they have a greater internal health locus of control and have a more open-ended view of their future.

The current study provides a basis for further investigation of the factors that are related to health promotion at midlife. The results lend support to the notion that future time perspective

is an important construct to consider when attempting to understand why middle-aged adults choose to engage in a variety of health promoting behaviors and may better inform future health interventions. Additional research is needed to identify the relations among personal and psychological factors at midlife in order to promote engagement in health promoting behaviors.

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Table 1

Descriptive Statistics for Demographic Variables

Variable	M	SD	Min	Max
Age (years)	49.94	4.96	40	66
Number of Doctor Visits (past 12 months)	4.1	4.68	0	30
Number of People in Household	3.11	1.23	1	6
Hours of Paid Work (per Week)	34.4	18.02	0	80
Hours of Unpaid Work (per Week)	2.8	5.64	0	40
Number of Chronic Health Conditions	3.39	2.35	0	9

Variable	N	%
Gender		
Male	33	30.3
Female	76	69.7
Ethnicity		
African American	2	1.8
Asian / Pacific Islander	1	0.9
Caucasian / White	103	94.5
Latino / Hispanic	1	0.9
Marital Status		
Cohabiting / Living w Partner	1	0.9
Married	88	80.7
Divorced	13	11.9
Remarried After Divorce	5	4.6
Education		
9 th to 11 th grade	1	0.9
High school diploma	28	25.7
College – Degree	55	50.5
Graduate – Degree	24	22
Income		
Less than \$25,000	3	2.8
\$25,000 - \$49,999	15	13.8
\$50,000 - \$74,999	17	15.6
\$75,000 - \$99,999	26	23.9
\$100,000 +	43	39.4

(table continues)

Table 1 (*continued*)

Variable	<i>N</i>	%
Take Vitamin Supplements		
Yes	71	65.1
No	37	
Insurance		
Public	26	23.9
Private	76	69.7
No insurance	5	4.6
Trust Health Care Provider		
A little	33	30.3
A great deal	75	68.8
Physically Able to access to Health Care		
Very easily	39	35.8
Moderately easy	36	33
Easy	21	19.3
Hard	1	0.9
Moderately hard	10	9.2
Very hard	0	0
Body Mass Index (BMI)		
Underweight	0	0
Normal Weight	28	25.7
Overweight	44	40.4
Obese	30	27.5
Chronic Health Conditions		
Arthritis	41	37.6
Heart Trouble	13	11.9
Back Problems	41	37.6
Breathing Problems	18	16.5
Diabetes	6	5.5
High Blood Pressure	30	27.5
Cancer	1	0.9
Glaucoma	1	0.9
Cataracts	4	3.7
Nervousness/Tension	37	33.9
Sleep problems	41	37.6
Headaches	45	41.3
Parkinson's Disease	1	0.9

(table continues)

Table 1 (continued)

Variable	<i>N</i>	%
Hardening of the Arteries	1	0.9
Stomach Ulcers	3	2.8
Stroke / Effects of stroke	1	0.9
Paralysis	2	1.8
Circulation Trouble	6	5.5
Asthma	10	9.2
Broken Hip	1	0.9
Other Broken Bones	6	5.5
Bladder Problems	17	15.6
Gall Bladder Trouble	6	5.5
Kidney Trouble	4	3.7
Anemia	5	4.6
Emphysema	1	0.9
Epileptic seizures	0	0
Pneumonia	1	0.9
Serious Hearing Problems	16	14.7
Serious Vision Problems	11	10.1

Table 2

Means and Standard Deviations for Key Study Variables

Variable	# Items	α	M	SD	Min	Max
Chronic Health Condition Severity	31	0.72	6.32	5.73	0	29
Future Time Perspective	10	0.91	48.42	11.94	10	70
Health Locus of Control						
Internality (Form A)	6	0.70	26.79	3.60	17	36
Internality (Form B)	6	0.73	26.24	3.74	17	35
Internality (Form C)	6	0.77	23.12	4.75	12	34
Health Promotion						
Physical Activity	8	0.85	17.89	5.37	8	32
Nutrition	9	0.80	23.96	5.14	10	34
Stress Management	8	0.75	19.52	4.10	12	32
Interpersonal Relations	9	0.85	27.53	5.01	18	36
Spiritual Growth	9	0.86	27.15	5.33	15	36
Health Responsibility	9	0.80	21.06	4.60	9	33
Total	52	0.94	137.12	22.95	86	191

Table 3

Bivariate Correlations among Key Study Variables

Variable	1	2	3	4	5	6	7
1. Age							
2. Gender	-.25*						
3. Perceived Limitation	.06	-.04					
4. Future Time Perspective	-.21*	.05	-.30**				
Internal Health Locus of Control							
5. Form A	-.06	.05	.02	.21*			
6. Form B	-.10	.07	.06	.25**	.61**		
7. Form C	-.06	-.07	-.05	.12	.50**	.57**	
Health Promotion							
8. Physical Activity	-.04	-.11	-.23*	.30**	.30**	.14	.14
9. Nutrition	-.07	.29**	-.23*	.41**	.25**	.16	.12
10. Stress Management	.11	.15	-.09	.26**	.24*	.08	.13
11. Interpersonal Relations	.04	.21*	-.16	.41**	.24*	.13	.08
12. Spiritual Growth	.20*	.12	-.23*	.54**	.29**	.18	.08
13. Health Responsibility	.08	.21*	-.23*	.26**	.12	-.03	-.19
14. Total	.07	.18	-.21*	.47**	.31**	.15	.08

(table continues)

Table 3 (continued)

Variable	8	9	10	11	12	13	14
Health Promotion							
8. Physical Activity							
9. Nutrition	.57**						
10. Stress Management	.38**	.53**					
11. Interpersonal Relations	.31**	.51**	.62**				
12. Spiritual Growth	.39**	.55**	.70**	.73**			
13. Health Responsibility	.39**	.58**	.52**	.55**	.57**		
14. Total	.67**	.81**	.79**	.80**	.84**	.77**	

* $p < .05$; ** $p < .01$

Table 4

Standardized and Unstandardized Estimates for Preliminary and Hypothesized Models

	Fully Saturated Model				Hypothesized Model			
	β	<i>b</i>	SE(<i>b</i>)	CR	β	<i>b</i>	SE(<i>b</i>)	CR
Future Time Perspective \leftarrow Age	-0.19	-0.45	0.22	-2.06*	-0.19	-0.45	0.22	-2.10*
Internal Health Locus of Control \leftarrow Age	-0.05	-0.04	0.07	-0.53	-0.05	-0.04	0.07	-0.53
Health Promotion \leftarrow Age	0.23	0.02	0.01	2.81*	0.23	0.02	0.01	2.80*
Future Time Perspective \leftarrow Gender	0.01	0.32	2.34	0.14	-	-	-	-
Internal Health Locus of Control \leftarrow Gender	0.05	0.36	0.75	0.48	0.05	0.36	0.75	0.48
Health Promotion \leftarrow Gender	0.20	0.19	0.07	2.56*	0.20	0.19	0.08	2.57*
Future Time Perspective \leftarrow Perceived Limitation	-0.29	-0.69	0.22	-3.20*	-0.29	-0.69	0.22	-3.21*
Internal Health Locus of Control \leftarrow Perceived Limitation	0.03	0.02	0.07	0.29	0.03	0.02	0.07	0.29
Health Promotion \leftarrow Perceived Limitation	-0.10	-0.08	0.01	-1.16	-	-	-	-
Health Promotion \leftarrow Future Time Perspective	0.44	0.02	0.00	5.20*	0.47	0.02	0.00	5.78*
Health Promotion \leftarrow Internal Health Locus of Control	0.22	0.03	0.01	2.81*	0.21	0.03	0.01	2.69*

R ² Observed Variables	
Future Time Perspective	0.005
Internal Health Locus of Control	0.119
Health Promotion	0.329

**p* < .0

Table 5

Model Fit Indices

Model	χ^2	df	p	TLI	CFI	RMSEA
1. Baseline – All paths tested	12.447	4	0.014	0.458	0.855	0.140
2. Dropping non hypothesized paths						
FTP \leftarrow Gender	12.465	5	0.029	0.617	0.872	0.118
HPLP \leftarrow Perceived Limitation: Hypothesized Model	13.791	6	0.032	0.667	0.867	0.110
3. Exploratory (dropping non significant HLoC predictors)						
HLoC \leftarrow Perceived Limitation	13.872	7	0.054	0.748	0.882	0.095
HLoC \leftarrow Gender	14.084	8	0.080	0.805	0.896	0.084
HLoC \leftarrow Age	14.477	9	0.106	0.844	0.906	0.075
4. Exploratory (testing HLPL II subscales)						
Health Responsibility	14.864	6	0.021	0.311	0.725	0.117
Physical Activity	15.999	6	0.014	0.280	0.712	0.124
Nutrition	14.811	6	0.022	0.547	0.819	0.117
Spiritual Growth	13.884	6	0.031	0.746	0.898	0.110
Interpersonal Relations	14.539	6	0.024	0.556	0.822	0.115
Stress Management	12.571	6	0.050	0.507	0.803	0.101

Table 6

Multiple Regression Coefficients

	<i>b</i>	(SE) <i>b</i>	β
Step 1			
Constant	1.76	0.50	
Age	0.01	0.00	.13
Gender	0.21	0.09	.22*
Perceived Limitation	-0.03	0.02	-.21*
Step 2			
Constant	-0.18	0.53	
Age	0.02	0.01	.23*
Gender	0.19	0.08	.20*
Perceived Limitation	-0.01	0.02	-.09
Internal Health Locus of Control	0.02	0.00	.22*
Future Time Perspective	0.03	0.01	.43*

Note: $R^2 = .10$ for Step 1, $\Delta R^2 = .25$ for Step 2 ($p < .01$). * $p < .05$.

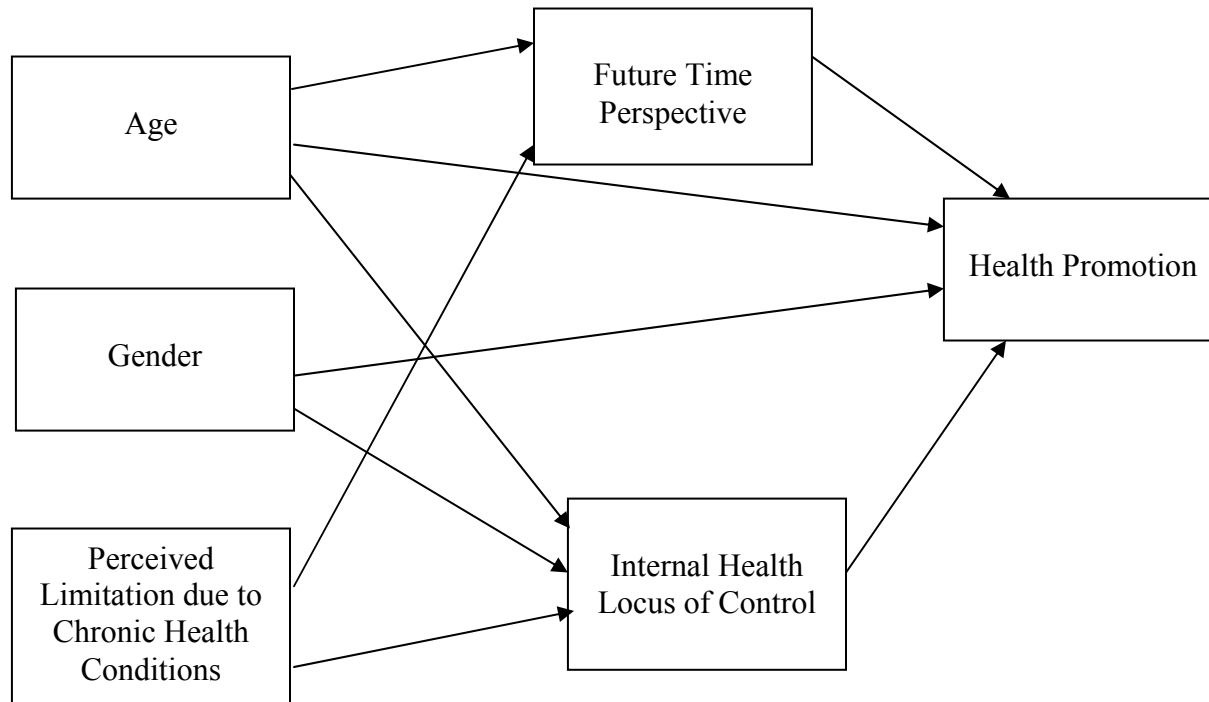


Figure 1. Hypothesized model where the measured, or observed variables, are represented by squares; relations between variables are represented by lines and lack of a line between variables indicates that no relation has been hypothesized.

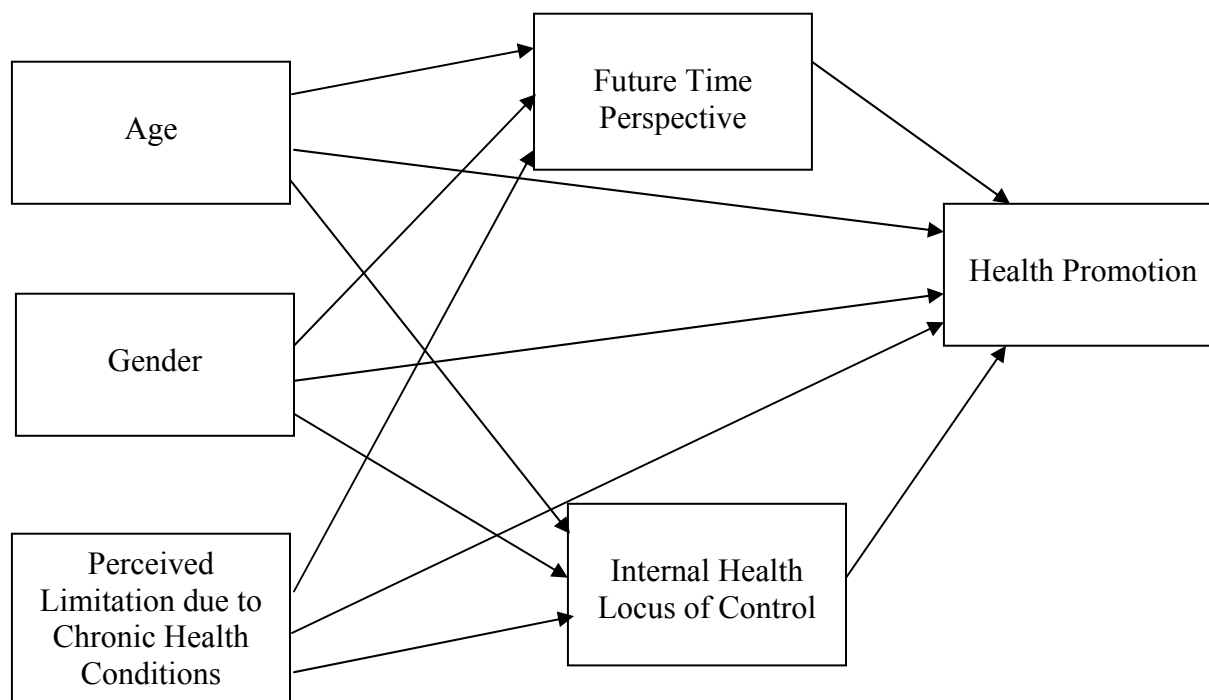


Figure 2. Baseline model, where all paths (hypothesized and not hypothesized) were tested simultaneously.

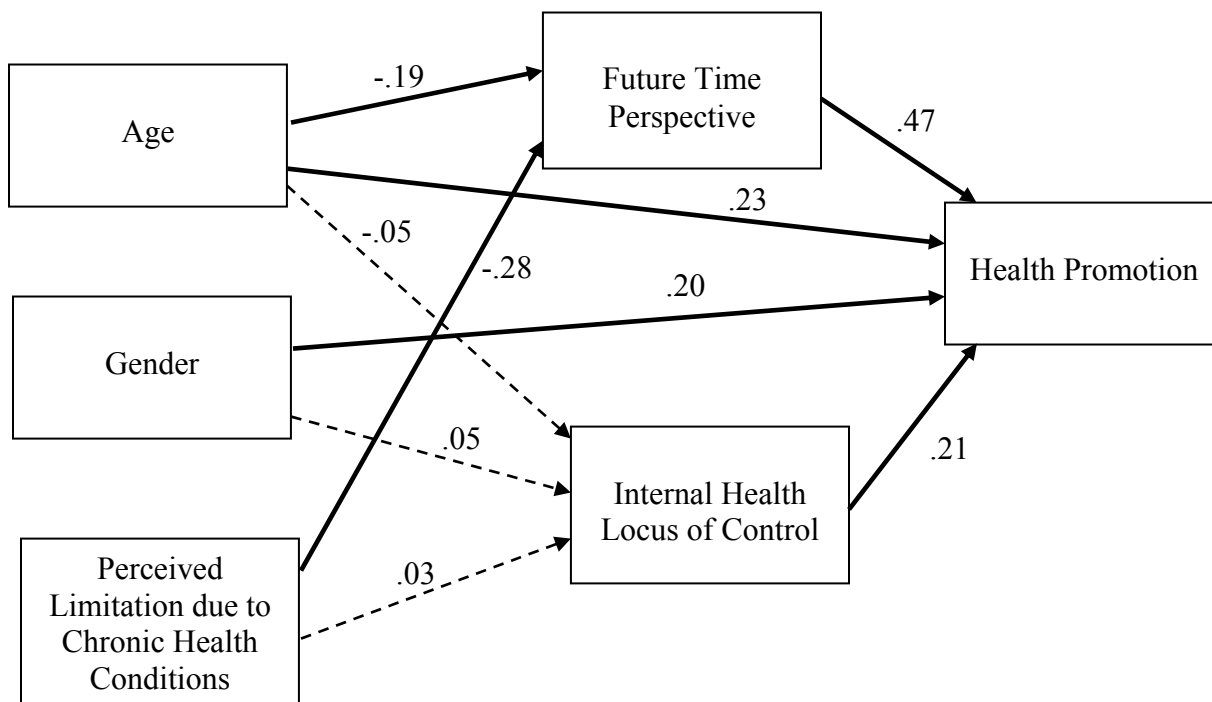


Figure 3. Hypothesized path model, where bolded lines indicate significant paths, dashed lines indicate nonsignificant paths, and lack of a line between variables indicates the path was dropped from model testing. All path estimates are standardized.

Appendix A: Personal Data Form

Please answer the following questions as honestly and accurately as possible:

1) Current Age: _____

2) Sex: ___Male ___Female

3) For descriptive purposes, could you please select the ethnicity category to which you most belong:

- ___ African American/ Black
- ___ Caucasian/ White
- ___ American Indian/ Alaskan Native
- ___ Asian/ Pacific Islander
- ___ Latino/ Hispanic
- ___ Other
- ___ I do not wish to provide an answer for this question

4) What is your current marital status:

- ___ Cohabiting/ Living with Partner (not married)
- ___ Married
- ___ Widowed
- ___ Divorced
- ___ Remarried after widowed
- ___ Remarried after divorce
- ___ Single/ Never married
- ___ I do not wish to provide an answer for this question

5) In what state do you currently reside: _____

6) How many people, including yourself, live in your home: _____

7) Select the **highest** level of education you have completed:

- ___ Less than 9th grade
- ___ 9th to 11th grade
- ___ High school diploma
- ___ College –Degree
- ___ Graduate Degree
- ___ I do not wish to provide an answer for this question

8) Total yearly family income:

- ___ Less than \$25,000
- ___ \$25,000- \$49,999
- ___ \$50,000- \$74,999

- \$75,000- \$99,999
 \$100,000 +
 I do not wish to provide an answer for this question

9) How many hours in a typical week do you spend in paid work: _____

10) How many hours in a typical week do you spend in unpaid volunteer work: _____

11) Do you currently smoke or use tobacco:

- Yes
 No
 I do not wish to provide an answer for this question

12) Do you wear seat belts regularly:

- Yes
 No
 I do not wish to provide an answer for this question

13) Do you take vitamin supplements:

- Yes
 No
 I do not wish to provide an answer for this question

14) If you take vitamin supplements, which types do you take: _____

15) How much sleep on average do you get: _____

16) What is your height (e.g., "5 ft 10 in"): _____

17) What is your weight (in pounds): _____

18) How many times have you visited the doctor in the last year: _____

19) I believe my life to be:

- Extremely Happy
 Very Happy
 Somewhat Happy
 Average
 Somewhat Unhappy
 Very Unhappy
 Extremely Unhappy

I do not wish to provide an answer to this question

20) What type of health insurance do you currently have:

- Private
 Public
 None
 I do not wish to provide an answer to this question

21) How much do you trust your health care providers:

- Not at all
 A little
 A great deal
 I do not wish to provide an answer to this question

22) How easily can you physically access your health care system:

- Very easily
 Moderately easy
 Easy
 Moderately hard
 Hard
 Very hard
 I do not wish to provide an answer to this question

23) What types of over the counter medicine do you take (Check all that apply):

- Flu medications
 Joint supplements
 Antacids
 Allergy medications
 Pain relievers including aspirin
 Cold medicine
 Anti-diarrhea medicine & laxatives
 Menstrual cycle products for pain and cramp relief
 Cough syrup, drops, and throat lozenges
 Sinus medications & nasal sinus sprays
 Nicotine gum or patches for smoking cessation
 Special ointment or cream for sunburn
 BenGay, Tiger Balm, and similar products for muscle or joint pain
 First aid cream, calamine lotion, bug bite medication, wart remover treatments
 Visine and other such eye products
 Suppositories and creams for hemorrhoids
 Sleeping aids
 Motion sickness pills
 I do not wish to provide an answer for this question

24) The following screens are recommended by the U.S. Department of Health and Human Services. Please indicate which of the following screens you have had:

- Obesity: Body Mass Index
- Cholesterol Screening
- High Blood Pressure
- Diabetes Screen
- HIV Screen
- Other Sexually Transmitted Diseases Screens
- Skin Cancer Screen
- Dental Screens
- Hearing Screen
- Vision Screen/ Eye Exam
- Glaucoma Screen

25) Have you ever had any of the following screens:

- Tobacco Cessation Screens
- Breast Cancer Screen
- Cervical Cancer Screen
- Prostate Cancer Screen
- Abdominal Aortic Aneurism Screen
- Colorectal Cancer Screen (colonoscopy)
- Osteoporosis Screen (bone density tests)
- Other screens not listed previously

Please indicate which conditions you currently have & how much difficulty each condition causes you.

	<u>DO YOU HAVE:</u>		<u>In terms of the difficulty it causes you, is it:</u>			
	No	Yes	None	Mild	Moderate	Severe
1. Arthritis	No	Yes	None	Mild	Moderate	Severe
2. Heart Trouble	No	Yes	None	Mild	Moderate	Severe
3. Back Problems	No	Yes	None	Mild	Moderate	Severe
4. Breathing Problems	No	Yes	None	Mild	Moderate	Severe
5. Diabetes	No	Yes	None	Mild	Moderate	Severe
6. High Blood Pressure	No	Yes	None	Mild	Moderate	Severe
7. Cancer	No	Yes	None	Mild	Moderate	Severe
8. Glaucoma	No	Yes	None	Mild	Moderate	Severe
9. Cataracts	No	Yes	None	Mild	Moderate	Severe
10. Nervousness/ tension	No	Yes	None	Mild	Moderate	Severe
11. Trouble getting or staying asleep	No	Yes	None	Mild	Moderate	Severe
12. Headaches	No	Yes	None	Mild	Moderate	Severe
13. Parkinson's Disease	No	Yes	None	Mild	Moderate	Severe
14. Hardening of the arteries	No	Yes	None	Mild	Moderate	Severe
15. Stomach ulcer	No	Yes	None	Mild	Moderate	Severe
16. Stroke or effects of Stroke	No	Yes	None	Mild	Moderate	Severe
17. Paralysis from any condition other than stroke	No	Yes	None	Mild	Moderate	Severe
18. Circulation trouble in arms or legs	No	Yes	None	Mild	Moderate	Severe
19. Asthma	No	Yes	None	Mild	Moderate	Severe
20. Broken Hip	No	Yes	None	Mild	Moderate	Severe
21. Other broken bones	No	Yes	None	Mild	Moderate	Severe
22. Bladder problems	No	Yes	None	Mild	Moderate	Severe
23. Gall Bladder trouble	No	Yes	None	Mild	Moderate	Severe
24. Kidney trouble	No	Yes	None	Mild	Moderate	Severe
25. Anemia	No	Yes	None	Mild	Moderate	Severe
26. Emphysema	No	Yes	None	Mild	Moderate	Severe
27. Epileptic seizures	No	Yes	None	Mild	Moderate	Severe
28. Pneumonia	No	Yes	None	Mild	Moderate	Severe
29. Serious hearing problems	No	Yes	None	Mild	Moderate	Severe
30. Serious vision problems	No	Yes	None	Mild	Moderate	Severe
31. Other _____	No	Yes	None	Mild	Moderate	Severe

In order to indicate your agreement with the items, please use the following scale:

1	2	3	4	5	6	7
Very Untrue						Very True

1. Many opportunities await me in the future.	
2. I expect that I will set many new goals in the future.	
3. My future is filled with possibilities.	
4. Most of my life lies ahead of me.	
5. My future seems infinite to me.	
6. I could do anything I want in the future.	
7. There is plenty of time left in my life to make new plans.	
8. I have a sense that time is running out.	
9. There are only limited possibilities in my future.	
10. As I get older, I begin to experience time as limited.	

Instructions: Each item below is a belief statement about your medical condition with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you agree or disagree with that statement. The more you agree with a statement, the higher will be the number you circle. The more you disagree with a statement, the lower will be the number you circle. Please make sure that you answer **EVERY ITEM** and that you circle **ONLY ONE** number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

		SD	MD	D	A	MA	SA
		1=STRONGLY DISAGREE (SD)		4=SLIGHTLY AGREE (A)			
		2=MODERATELY DISAGREE (MD)		5=MODERATELY AGREE (MA)			
		3=SLIGHTLY DISAGREE (D)		6=STRONGLY AGREE (SA)			
1	If my condition worsens, it is my own behavior which determines how soon I will feel better again.	1	2	3	4	5	6
2	As to my condition, what will be will be.	1	2	3	4	5	6
3	If I see my doctor regularly, I am less likely to have problems with my condition.	1	2	3	4	5	6
4	Most things that affect my condition happen to me by chance.	1	2	3	4	5	6
5	Whenever my condition worsens, I should consult a medically trained professional.	1	2	3	4	5	6
6	I am directly responsible for my condition getting better or worse.	1	2	3	4	5	6
7	Other people play a big role in whether my condition improves, stays the same, or gets worse.	1	2	3	4	5	6
8	Whatever goes wrong with my condition is my own fault.	1	2	3	4	5	6
9	Luck plays a big part in determining how my condition improves.	1	2	3	4	5	6
10	In order for my condition to improve, it is up to other people to see that the right things happen.	1	2	3	4	5	6
11	Whatever improvement occurs with my condition is largely a matter of good fortune.	1	2	3	4	5	6
12	The main thing which affects my condition is what I myself do.	1	2	3	4	5	6
13	I deserve the credit when my condition improves and the blame when it gets worse.	1	2	3	4	5	6
14	Following doctor's orders to the letter is the best way to keep my condition from getting any worse.	1	2	3	4	5	6
15	If my condition worsens, it's a matter of fate.	1	2	3	4	5	6
16	If I am lucky, my condition will get better.	1	2	3	4	5	6
17	If my condition takes a turn for the worse, it is because I have not been taking proper care of myself.	1	2	3	4	5	6
18	The type of help I receive from other people determines how soon my condition improves.	1	2	3	4	5	6

Appendix E: Health Promotion Lifestyle Profile II

This questionnaire contains statements about your **PRESENT** way of life or personal habits. Please respond to each item as accurately as possible, and try not to skip any item. Indicate the frequency with which you engage in each behavior by circling: 0 (Never), 1 (Sometimes), 2 (Often), or 3 (Routinely)

1. Discuss my problems and concerns with people close to me.

Never
Sometimes
Often
Routinely

2. Choose a diet low in fat, saturated fat, and cholesterol.

Never
Sometimes
Often
Routinely

3. Report any unusual signs or symptoms to a physician or other health professional.

Never
Sometimes
Often
Routinely

4. Follow a planned exercise program.

Never
Sometimes
Often
Routinely

5. Get enough sleep.

Never
Sometimes
Often
Routinely

6. Feel I am growing and changing in positive ways.

Never
Sometimes
Often
Routinely

7. Praise other people easily for their achievements.

Never
Sometimes
Often
Routinely

8. Limit use of sugars and food containing sugar (sweets).

- Never
- Sometimes
- Often
- Routinely

9. Read or watch TV programs about improving health.

- Never
- Sometimes
- Often
- Routinely

10. Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber).

- Never
- Sometimes
- Often
- Routinely

11. Take some time for relaxation each day.

- Never
- Sometimes
- Often
- Routinely

12. Believe that my life has purpose.

- Never
- Sometimes
- Often
- Routinely

13. Maintain meaningful and fulfilling relationships with others.

- Never
- Sometimes
- Often
- Routinely

14. Eat 6-11 servings of bread, cereal, rice, and pasta each day.

- Never
- Sometimes
- Often
- Routinely

15. Question health professionals in order to understand their instructions.

- Never
- Sometimes

Often
Routinely

16. Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week).

Never
Sometimes
Often
Routinely

17. Accept those things in my life that I can not change.

Never
Sometimes
Often
Routinely

18. Look forward to the future.

Never
Sometimes
Often
Routinely

19. Spend time with close friends.

Never
Sometimes
Often
Routinely

20. Eat 2-4 servings of fruit each day.

Never
Sometimes
Often
Routinely

21. Get a second opinion when I question my health care provider's advice.

Never
Sometimes
Often
Routinely

22. Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling).

Never
Sometimes
Often
Routinely

23. Concentrate on pleasant thoughts at bedtime.

- Never
- Sometimes
- Often
- Routinely

24. Feel content and at peace with myself.

- Never
- Sometimes
- Often
- Routinely

25. Find it easy to show concern, love, and warmth to others.

- Never
- Sometimes
- Often
- Routinely

26. Eat 3-5 servings of vegetables each day.

- Never
- Sometimes
- Often
- Routinely

27. Discuss my health concerns with health professionals.

- Never
- Sometimes
- Often
- Routinely

28. Do stretching exercises at least 3 times per week.

- Never
- Sometimes
- Often
- Routinely

29. Use specific methods to control my stress.

- Never
- Sometimes
- Often
- Routinely

30. Work toward long-term goals in my life.

- Never
- Sometimes

Often
Routinely

31. Touch and am touched by people I care about.

Never
Sometimes
Often
Routinely

32. Eat 2-3 servings of milk, yogurt, or cheese each day.

Never
Sometimes
Often
Routinely

33. Inspect my body at least monthly for physical changes/danger signs.

Never
Sometimes
Often
Routinely

34. Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking).

Never
Sometimes
Often
Routinely

35. Balance time between work and play.

Never
Sometimes
Often
Routinely

36. Find each day interesting and challenging.

Never
Sometimes
Often
Routinely

37. Find ways to meet my needs for intimacy.

Never
Sometimes
Often
Routinely

38. Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day.
Never
Sometimes
Often
Routinely
39. Ask for information from health professionals about how to take good care of myself.
Never
Sometimes
Often
Routinely
40. Check my pulse rate when exercising.
Never
Sometimes
Often
Routinely
41. Practice relaxation or meditation for 15-20 minutes daily.
Never
Sometimes
Often
Routinely
42. I am aware of what is important to me in life.
Never
Sometimes
Often
Routinely
43. Get support from a network of caring people.
Never
Sometimes
Often
Routinely
44. Read labels to identify nutrients, fats, and sodium content in packaged food.
Never
Sometimes
Often
Routinely
45. Attend educational programs on personal health care.
Never
Sometimes

Often
Routinely

46. Reach my target heart rate when exercising.

Never
Sometimes
Often
Routinely

47. Pace myself to prevent tiredness.

Never
Sometimes
Often
Routinely

48. Feel connected with some force greater than myself.

Never
Sometimes
Often
Routinely

49. Settle conflicts with others through discussion and compromise.

Never
Sometimes
Often
Routinely

50. Eat breakfast.

Never
Sometimes
Often
Routinely

51. Seek guidance or counseling when necessary.

Never
Sometimes
Often
Routinely

52. Expose myself to new experiences and challenges.

Never
Sometimes
Often
Routinely