

POSSIBLE SELVES AND PERCEIVED COMPETENCE IN RELATION TO COGNITION
AND HEALTH

By

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To my Mom, Darlene Ann Dark,
I miss you.

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By

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Markus and Nurius defined (1986) possible selves as elements of the self-concept that represent what an individual could become, would like to become, or is afraid of becoming. These personally meaningful hopes and fears are of central importance in the self-concept. Believing that we have the ability to attain our most important hopes and avoid our most dreaded fears may be central to maintaining positive psychological functioning or well-being.

The central focus of this research was to examine age differences in possible selves related to cognition and health and to examine how beliefs about the competent self influence psychological well-being. We found that younger adults reported a greater number of cognitive selves than both middle-aged and older adults. The cognitive selves younger adults reported tended to be hopes related to education; the cognitive selves middle-aged and older adults reported tended to be hopes related to learning new skills and continuing to engage in cognitively stimulating activities, as well as fears related to cognitive decline. In contrast, middle-aged adults reported a greater number of health fears than both older and younger adults. These fears included statements related to specific diseases such as having a heart attack or stroke, or general statements related to maintaining or losing health.

To examine the relationship between age, competence and psychological well-being several structural equation models were tested. The paths between competence and psychological well-being

were significant for health but not for cognition. We believe this was due to the fact that our younger, middle-aged, and older adults all reported high levels of competence related to cognition.

Our sample was high functioning and reported relatively high levels of domain-specific competence and as well as high levels of positive psychological well-being. Unfortunately we were not able to test the relationship between low levels of competence and psychological well-being. Our results still support that idea that believing we have the ability to attain our most important hopes and avoid our most dreaded fears, especially when faced with declines in health or cognition that may threaten our ability to do so, may be central to maintaining positive psychological well-being and skilled performance as we age.

CHAPTER 1 INTRODUCTION

As we move through life, declines in physical and mental abilities will occur across multiple domains. Our beliefs and expectations about the aging process may impact how we perceive, respond to and manage experienced decline. Of course some domains are more important than others. When a given domain like health or cognition is personally meaningful to us, the value we place on that domain is reflected within our future hopes and fears. These personally meaningful hopes and fears are called possible selves (Markus & Nurius, 1986). These selves are of central importance to who we are and who we hope to become. Believing that we have the ability to attain our most important hopes and avoid our most dreaded fears, especially when faced with declines that may threaten our ability to do so, may be central to maintaining positive psychological functioning or well-being.

Possible Selves

Markus and Nurius defined (1986) possible selves as elements of the self-concept that represent what an individual could become, would like to become, or is afraid of becoming. These personally meaningful hopes and fears are of central importance in the self-concept. Although each individual has certain selves that are central to his or her identity, the meanings of these selves may change over time (Cross & Markus, 1991). Possible selves develop with us as we move through life. Which selves will be dominant depends on the individual and the context he or she experiences at any given point in time (Markus & Wurf, 1987).

Recent studies have examined age-related differences and changes in possible selves. Differences exist not only in the types of selves reported by age, but in the number of selves reported. Older adults consistently report fewer possible selves than younger adults (Cross & Markus, 1991; Hooker, 1992). Older adults also report more specific, more realistic possible

selves than younger adults (Cross & Markus, 1991; Hooker, 1992). In general, the possible selves older adults report are more in line with their current identity; they typically involve the continuation or maintenance of current activities and relationships, but may also include continued growth (Cross & Markus, 1991; Frazier, Hooker, Johnson, & Kaus, 2000; Hooker, 1992; Smith & Freund, 2002). Age differences in specific domains have also been found. Hooker and Kaus (1994) found that health-related selves are common in later life and begin to increase in frequency in middle age (Hooker, 1992; Hooker & Kaus, 1992; Hooker & Kaus, 1994). Research has also shown that older adults report a greater number of fears related to memory and cognition than younger adults (Dark-Freudeman, West, & Viverito, 2006). Thus, the frequency of health and cognitive selves increases with age as health and cognition become more salient during later life when many individuals are confronted with personal declines in physical and mental abilities.

Changes in possible selves result in changes in levels of motivation and feelings of self-efficacy (Cameron, 1999; Cross & Markus, 1991; Hooker, 1992). Possible selves have also been related to psychological well-being and life satisfaction (Cross & Markus, 1991; Smith & Freund, 2002). Cross and Markus (1991) found that individuals lower in life satisfaction were more likely to report hoped-for selves related to personal characteristics and feared selves related to being alone. Individuals scoring lower in life satisfaction also tended to report more extreme hopes and fears (Cross & Markus, 1991). Further, feared selves in the health domain have been associated with declines in life satisfaction, satisfaction with aging, and subjective health (Smith & Freund, 2002). The presence of feared health selves have also been associated with greater reports of engaging in health behaviors, suggesting that fears can actually have a positive motivational effect (Hooker & Kaus, 1994). The proposed study will help clarify the

relationship between possible selves and well-being by focusing on two specific domains that are likely to be highly valued (cognition and health) and by including multiple indicators of competence, and both positive and negative well-being.

Self-Perceived Competence

The need for competence is a universal need that exists across different cultures, individuals, and domains (Skinner, 1995). Although what it means to be competent at a given activity may change over time, perceiving oneself as competent is important throughout the life span (Brandtstadter, 1989; Brandtstadter, Rothermund, & Schmitz, 1998). Self-perceived competence includes beliefs about self-efficacy and personal control, and expectations regarding the possible outcomes surrounding a given domain or situation (Skinner, 1995). These beliefs and expectations work together to motivate action and interpret outcomes (Bandura, 1997). There is considerable evidence for age declines in feelings of competence, particularly in the memory domain. Given a well-developed literature on memory self-evaluation and relatively little on self-perceptions regarding general cognition (e.g., speed of processing, attention, reasoning), the cognitive focus of this research will be on memory self-perceptions.

Declines in cognitive abilities are seen as an inevitable and normative developmental process by adults of all ages (Heckhausen, Dixon, and Baltes, 1989; Lineweaver & Hertzog, 1998; Ryan, 1992). Further, older adults report lower levels of memory self-efficacy than younger adults (Berry, West, & Dennehy, 1989; Hultsch, Hertzog, & Dixon, 1987), and less control over memory than younger adults (Hultsch et al., 1987; Lachman, Bandura, Weaver, & Elloitt, 1995). These average declines in perceived memory are well documented, but the impact these beliefs have on well-being has not been investigated. That is a key goal of this research.

Psychological Well-Being

Well-being is multidimensional (Ryff, 1989) and involves both positive and negative emotions and evaluations (Diehl, Hastings, & Stanton, 2001; Diener, Emmons, Larsen, Griffin, 1985; Updegraff, Gable, & Taylor, 2004). The current proposal defines well-being as positive psychological functioning. Positive psychological functioning refers to a general satisfaction with oneself and one's life and low levels of anxiety and depression. Feelings of positive and negative well-being may be related to biological influences (genetic or neurological factors), environmental influences (negative life events or stress), or beliefs about the self such as perceived discrepancies between who one is and who one wishes to be (Berenbaum, Raghavan, Le, Vernon, & Gomez, 1999).

In general, older and middle-aged adults consistently report equivalent or greater levels of well-being compared to younger adults (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000) despite age-related declines in multiple abilities. Ryff (1989) found that although older and younger adults reported similar levels of happiness and self-esteem, older adults also reported higher levels of depression, and lower levels of purpose in life and personal growth than younger individuals. This suggests that measures of general life satisfaction may be missing part of the picture. For this reason, the current proposal will use multiple measures of positive and negative psychological well-being.

When an individual perceives a large gap between their current self and their most meaningful hoped-for possible self, or when the gap between the current self and a feared possible self narrows, well-being may be compromised. If the individual no longer feels capable of attaining the hope or preventing the fear, depression or anxiety may result. Perceptions of competence in a valued domain could control variations in positive and negative aspects of well-

being. We predict that positive psychological functioning (higher levels of positive well-being and lower levels of negative well-being) will be greater for individuals with higher levels of perceived competence within their highly valued, self-defining domains.

Possible Selves, Self-Perceived Competence, and Psychological Well-Being

The central focus of this research is examining how beliefs about the competent self influence psychological well-being. This study will allow us to address this key question: what are the consequences of perceiving that you have low capability in a domain of function that is central to your self-concept?

This research emphasizes the importance of domain-specific beliefs about the self. In particular, we believe that positive well-being depends on feelings of success in domains that are important to one's self-concept, and that a negative sense of well-being may be most common in individuals who are sensing declining capabilities in domains of personal importance to them. As part of the self-concept, possible selves motivate and guide actions and emotions in personally meaningful ways (Markus & Nurius, 1986). For instance, we know that middle-aged and older individuals who reported a possible self in the health domain also reported engaging in a greater number of health behaviors like exercising, dieting, and seeking regular medical care. In fact, reporting a health self was more strongly related to health behaviors than was placing a high value on health alone (Hooker & Kaus, 1992; Hooker & Kaus, 1994). Like health (Hooker, 1992; Hooker & Kaus, 1992; Hooker & Kaus, 1994), cognition is believed to become more salient with age (Berry & West, 1993; Cavanaugh, Feldman, & Hertzog, 1998; Dark-Freudeman, West, Viverito, 2006; Hultsch, et al., 1987). Our previous research has shown that cognitive selves, and fears in particular, are more apparent in older adults' repertoire of possible selves, as older adults anticipate and experience declines. However, the practical importance of having a

possible self within the cognitive domain has yet to be fully understood. For aging individuals reporting a cognitive or health self, higher levels of SPC in that domain may be essential for maintaining higher levels of PWB.

Hypotheses

This project examines how hopes and fears related to health and cognition, self-perceived competence (SPC) in the domains of health and cognition, and psychological well-being (PWB) are related. The specific aims of the current study are as follows:

1. **Identify age differences in possible selves related to cognition and health.** Earlier research on health possible selves has established age differences in health selves, but generally has not separated health selves (e.g., fears about losing physical strength) from cognitive selves (e.g., fears about losing memory). This research will consider both domains separately. Earlier work on health selves showed that older adults report a greater number of selves related to health than middle-aged and younger adults (Hooker, 1992; Hooker & Kaus, 1992; Hooker and Kaus, 1994). We expect to replicate these results. Our pilot work on cognitive possible selves has shown that cognition is important to both older and younger adults. Older adults are more concerned with maintaining or losing cognitive functions, whereas younger adults are more concerned with cognitive activities like learning and performing well in educational and career settings. This investigation will replicate those past findings, distinguish between health selves and cognitive selves, and extend the cognitive data to middle-aged adults. It is critical to include middle-aged adults, to understand when feared selves begin to emerge, and to understand whether cognitive selves and health selves emerge at different times.
2. **Examine the interrelationship between age, self-perceived competence (SPC), and psychological well-being (PWB).** PWB will be evaluated in relation to age differences in SPC for the health domain and for the cognitive domain. Consistent with past research, age differences are expected in SPC in both domains, whereas age differences in overall PWB are not expected. For older adults in general, anticipating or experiencing declines in cognition and health is more salient than it is for younger adults, and those older adults with particular concerns about their declining competence should have lower PWB. Therefore, we expect the relationship between SPC and PWB to interact with age: to be stronger for older adults than for younger adults, with middle-aged adults falling in between.
3. **Predict psychological well-being for individuals for whom cognition or health is of central importance.** Those individuals who spontaneously report cognitive or health selves see that particular domain as central to who they are. Therefore, their PWB should be dependent on their SPC in that domain. When cognition or health is not a central

feature of the self, SPC should not be highly related to PWB. Thus, for individuals with health selves, SPC for health should predict PWB; for individuals with a cognitive self, SPC for cognition should predict PWB. For the domain of cognition alone, we will also evaluate the potential moderating effects of objective performance on this relationship.

CHAPTER 2 METHODS

Participants

The sample included 347 participants. Younger adults, ages 18 to 39 ($M = 21.16$, $SD = 5.45$) were recruited through the University of Florida's research participant pool. Middle-aged adults, ages 40 to 64 ($M = 54.84$, $SD = 7.24$) and older adults, ages 65 to 90 ($M = 73.47$, $SD = 5.66$) were the parents and grandparents of younger participants. Six participants were excluded from the study. Four participants were excluded for scoring below a 30 on the Telephone Interview of Cognitive Status. Two additional participants were excluded for failing to answer the questionnaire in a consistent manner. Health and education were examined as a function of age. Significant differences were found for health, $F(2, 338) = 8.30$, $p < .001$. Younger adults reported significantly better health than both middle-aged and older adults. Significant differences were also found for education, $F(2, 338) = 11.48$, $p < .001$. Middle-aged adults reported significantly more years of education than both younger and older adults (see Table 2.1).

Procedure

Participants completed a take-home survey on possible selves, self-perceived competence, and well-being, which took approximately 2 hours. Each packet began with the open-ended portion of the possible selves questionnaire. Participants then completed the remaining items concerning memory and health beliefs. Last, participants completed the SF-36 health survey and a Participant Information form, to provide basic demographic information. Younger adults were asked to return their surveys to the psychology building. Middle-aged and older adults returned their surveys in prepaid envelopes. After the surveys were returned, participants were contacted

by phone to clarify any unclear responses (such as illegible or blank items) and to complete a cognitive test battery by telephone.

Possible Selves and Goal-Oriented Activities

Participants completed the open-ended questionnaire developed by Cross and Markus (1991), and used extensively in aging research (Hooker, 1999). This questionnaire was designed to spontaneously elicit both hoped-for and feared possible selves. These spontaneously-generated selves are believed to be central to the individual's identity. Participants were first asked to list all of their hoped-for selves, then to select their three most important, hoped-for selves. Next, participants listed the goal-oriented activities they have recently undertaken to accomplish each of their three most important hoped-for selves, and answered 6 questions to assess self-efficacy, and perceived control over attaining each of these three most important selves. Participants were asked to rate the following statements on a seven-point Likert scale: "How capable do you feel of achieving this possible self?" and "How likely do you think it is that this possible self will be achieved?" for self-efficacy and outcome expectancy respectively. Next, participants listed all of their feared selves, and selected their three most dreaded, feared selves. For each most dreaded self, a matched series of questions about recent goal-oriented activities, self-efficacy and perceived control was answered. Participants also rated personal importance for all spontaneously-mentioned most important and most dreaded selves.

To examine the content of the spontaneously-generated possible selves, thirteen categories of selves were created: personal characteristics, health, social, career, financial, life events, cognitive statements, cognitive activities, cognitive educational, cognitive miscellaneous, memory, dependency, and other. Personal characteristics included statements about personal traits such as "being more compassionate" or "becoming a grumpy old person." Health-related selves included direct statements such as "maintaining or losing my health," "avoiding illness,"

and “remaining physically active.” Health-related selves also included more specific statements such as “becoming a cancer patient,” “having a stroke or heart attack,” and “losing the ability to see.” Social selves included hopes such as “spending more time with family and friends” as well as fears such as “being alone.” Career-related selves included statements related to working or changing careers such as “becoming a doctor” or “starting my own business.” Financial-related selves included hopes and fears related to money and attaining possessions such as “having enough money to retire early” or “being able to buy a vacation home on the beach.” Life events included statements related to getting married, having children, and losing a spouse. Cognitive statements included hopes such as “staying mentally active” and fears such as “losing my mind.” Cognitive activities included statements about engaging in cognitively engaging activities such as reading and chess. Cognitive education included statements about learning new skills and doing well in school. Cognitive miscellaneous category included statements related to volunteering, traveling, and hobbies such as woodworking or knitting. Memory-related selves included “becoming an Alzheimer’s patient,” “senile,” or “demented,” and also included positive items such as “improving my memory ability” and remembering specific items, like vocabulary and dance steps. Dependency-related selves included general statements like “maintaining my independence” or “becoming dependent on another,” but also included such statements as becoming a “burden on my family” and “moving into a nursing home.” Lastly, other selves included statements related to hopes and fears about other people such as “I hope that my grandkids are successful in life” as well as statements that did not fit into any of the above categories.

Two independent raters categorized the possible selves according to these categories. To examine the agreement between these two independent raters, interrater reliability, also known as

kappa, was calculated. Kappas can range from -1.0 to 1.0, with larger numbers indicating better reliability. Kappas were .68 for hopes and .75 for fears. For most important hopes, kappas were between .76 and .80. For most important fears, kappas were between .84 and .93. After assessing reliability of the coding system with kappas, disagreements were resolved by discussion to select one category for each participant response. See Table 2.2 for the percentage of agreement between raters for health and cognitive selves.

Self-Perceived Cognitive Competence

For many older adults, the key aspect of cognition that triggers functional concerns about decline is memory, therefore, additional assessments of self-perceived cognitive competence (SPCC), which are not derived from the possible selves questionnaire, focus on memory. Measures of SPCC included the possible selves items on efficacy and perceived control related to achieving a most important hoped-for or avoiding a most dreaded feared cognitive self as well as the measures described below. We created a single index from these possible selves, called PSQ. To create the PSQ measure several steps were required. First we calculated the average of the outcome expectancy responses for both cognitive hopes and fears. Next we calculated the average of the self-efficacy responses for cognitive hopes and fears. These two averages were then summed to create one measure of PSQ, ranging from 2 to 14.

The Metamemory in Adulthood scale (MIA) developed by Dixon, Hultsch, and Hertzog (1988) is a standard measure of memory beliefs that has shown consistent validity and reliability. The MIA subscales known to assess SPCC are capacity, change, and locus (Hultsch, Hertzog, Dixon, & Davidson, 1988). These subscales include items like the following: “I have no trouble remembering where I have put things,” and “I have little control over my memory ability.” Each item will be rated on a 5-point Likert scale, (1 = agree strongly, 5 = disagree strongly). The

subscales had high internal consistency with alpha coefficients between .63 and .91. To create each scale, items were summed. Scores ranged from 1 to 5 on each scale.

General Memory Self-efficacy (GME) represents a brief 3-item measure of SPCC with strong internal consistency; scores on the GME are significantly correlated with recall scores and longer scales of memory self-efficacy (West & Yassuda, 2004). Participants are first primed to think about their everyday memory experience by answering this item: “How important has it been to you to perform well on memory activities in your everyday life?” (1 = not important at all, 7 = very important). This is followed by the three critical scale items on a 7-point Likert scale: “How have you performed on most memory tasks you have done recently?” (1 = very poor, 7 = very good); “How do you think your memory compares with most other people your age?” (1 = much worse, 7 = much better); and “How satisfied are you with your recent memory performance?” (1 = very satisfied, 7 = very unsatisfied). The GME had high internal consistency with an alpha coefficient of .90. Responses across the three critical scale items were summed to get the final score. Scores on the GME, ranging from 3 to 21, represent an individual’s general evaluation of their memory skill.

Self-Perceived Health Competence

Just as with cognition, measures of self-perceived health competence (SPHC) included the possible selves items on efficacy and perceived control related to achieving a most important hoped-for or avoiding a most dreaded feared health self. To create this PSQ scale for health, several steps were required. First we calculated the average of the outcome expectancy responses for both hopes and fears for health. Next we calculated the average of the self-efficacy responses for both hopes and fears related to health. These two averages were then summed to create one measure of PSQ for health, ranging from 2 to 14.

The Multidimensional Health Locus of Control Form B (MHLC) is an 18-item questionnaire that assesses the degree to which an individual feels that maintaining his or her general health is primarily due to internal control, external control, or chance (Wallston, Wallston, & DeVellis, 1978). Participants responded using a 6-point Likert scale (1 = Strongly disagree, 6 = Strongly agree). Example items include: “If I become sick, I have the power to make myself well again,” “When I am sick, I just have to let nature run its course,” and “If I see an excellent doctor regularly, I am less likely to have health problems.” The MHLC had internal consistency with alpha coefficients between .60 and .75. Scale scores were calculated by summing the items for each subscale and ranged from 6 to 36.

The Self-Rated Abilities for Health Practices scale (SRAHP) is a 28-item scale that measures health-related self-efficacy on four subscales: exercise, stress management, nutrition, and health practices (Becker, Stuifbergen, Oh, & Hall, 1993). Participants responded on a 4-point scale (0 = Not at all, 4 = Completely) to statements such as: “I am able to do exercises that are good for me,” “I am able to change things in my life to reduce stress,” “I am able to eat a balanced diet,” and “I am able to use medication correctly.” The SRAHP had high internal consistency both overall (alpha = .94) and for the individual exercise (alpha = .92), nutrition (alpha = .81), well-being (alpha = .90), and responsible health practices subscales (alpha = .86). Items were summed to create each subscale and ranged from 0 to 28 for these individual subscales. The individual subscales were also summed to create an overall measure of Health Self-Efficacy (HSE) and ranged from 0 to 112.

Psychological Well-Being

Positive psychological well-being was assessed using multiple measures including positive affect, self-esteem, and a multidimensional measure including six different dimensions of positive psychological functioning (Ryff, 1989). These three measures were combined to create

a composite measure of positive psychological well-being (PWB). Negative psychological well-being was assessed using a measure of negative affect, anxiety, and depression. These three measures were combined to create a composite measure of negative PWB.

Ryff's Scales of Psychological Well Being (SPWB) were used to assess six dimensions: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth (Ryff, 1989). Each subscale included 9 items on a 6-point scale (1 = strongly disagree, 6 = strongly agree). The autonomy subscale included items such as: "My decisions are not usually influenced by what everyone else is doing," and "It's difficult for me to voice my own opinions on controversial matters." Environmental mastery included items like: "I generally do a good job of taking care of my personal finances and affairs," and "I get frustrated when trying to plan my daily activities because I never accomplish the things I set out to do." The personal growth subscale included items such as: "I am the kind of person who likes to give new things a try," and "When I think about it, I haven't really improved much as a person over the years." The positive relations with others subscale included items like: "I know that I can trust my friends, and they know they can trust me," and "Maintaining close relationships has been difficult and frustrating for me." Purpose in life included items such as: "I enjoy making plans for the future and working to make them a reality" and "I sometimes feel as if I've done all there is to do in life." Last, the self-acceptance subscale included items such as: "The past had its ups and downs, but in general, I wouldn't want to change it," and "In many ways I feel disappointed about my achievements in life." The subscales had high internal consistency: autonomy (alpha = .83), environmental mastery (alpha = .86), personal growth (alpha = .85), positive relations (alpha = .88), purpose in life (alpha = .88), and self-acceptance (alpha = .91). Items were summed to create each subscale. Each subscale consisted of 7 items, with the

exception of Purpose in Life, which included 8 items. Scores ranged from 7 to 42 for all subscales, except Purpose in Life which ranged from 8 to 48.

The Positive and Negative Affect Scale (PANAS) assesses two primary dimensions of mood. Positive affect refers to the extent to which an individual feels excited, strong, and alert. Negative affect refers to the extent to which an individual feels irritable, jittery, and ashamed (Watson, Clark, & Tellegen, 1988). The scale included a total of 20 descriptors rated on a 5-point Likert scale (1 = Very slightly or not at all, 5 = Extremely). Half of these items were negative and half positive. Internal consistency was high for positive affect (alpha between .86 and .90) and for negative affect (alpha between .84 and .87). Items were summed to create a positive and negative scale of mood each ranging from 10 to 50.

The Self-Esteem Scale (SES) assesses the degree to which a person feels satisfied with him or herself (Rosenberg, 1965). The scale included 10 items rated on a 4-point scale (1 = Strongly agree, 4 = Strongly disagree). Example items include: “On the whole, I am satisfied with myself,” and “At times I think I am no good at all.” The SES had high internal consistency with alpha coefficients between .85 and .88. Items were summed to create the SES scale with scores ranging from 10 to 40.

The Center for Epidemiological Studies Depression Scale (CES-D) assesses the degree to which an individual has experienced depressive symptoms. Respondents rated the frequency with which they have experienced particular depressive symptoms during the past week such as: “I felt hopeful about the future,” and “I was bothered by things that usually don’t bother me.” Possible responses can range from 0 (less than 1 day) to 3 (5–7 days). The 20-item CES–D scale is designed to measure depression in the general population (Radloff, 1977) and has also been shown to be appropriate for use in older adult populations (Hertzog, Van Alstine, Usala, Hultsch,

et al., 1990). Internal consistency is usually high ($\alpha = .85$) in community samples. Items were summed and scores ranged from 0 to 60.

The State Anxiety scale of the State-Trait Anxiety Inventory (STAI; Spielberger, 1983) assesses participants' current anxiety levels. Participants responded to 20 statements on a 4-point scale (1 = Not at all, 4 = Very much so) such as: "I feel calm," and "I am jittery." The state scale of the STAI has well-established psychometric validity and reliability as a measure of current individual arousal levels (Spielberger, 1983). The STAI has high internal consistency with alpha coefficients between .89 and .92 (Spielberger & Sydeman, 1994). Responses to the STAI are summed, with a total score varying from 20 to 80.

Demographic and Functional Assessment

The Brandeis Test of Adult Cognition by Telephone (BTACT) was used to assess memory and cognition: verbal memory (immediate and delayed), working memory span, verbal fluency, reasoning, and speed of processing. This test battery is a valid assessment tool, strongly related to traditional laboratory measures conducted in person (Tun & Lachman, 2004). For the domain of cognition alone, administration of this test battery by telephone will make it possible to test the relationship between cognitive ability, SPCC, and PWB. The BTACT was administered during the follow-up phone call. The verbal memory test was used as an objective indicator of cognitive performance; the other BTACT activities that were completed during this phone call are not relevant to the purpose of the current study. For the verbal memory test, participants were read a list of 15 words, with a one second interval between each word. Participants were then immediately asked to tell the experimenter "as many words as they could remember." Participants were given 90 seconds to recall. Correct words, intrusions and repetitions were recorded.

The SF-36 short-form health survey developed by Ware and Sherbourne (1992) assesses the degree to which health and depression affect an individual's participation in daily activities. This survey was used because it provides information on eight comprehensive subscales in a relatively short and simple format. The SF-36 is composed of the following subscales: General Health, Physical Limitations, Physical Functioning, Bodily Pain, Vitality, Emotional Limitations, Social Functioning, and Mental Health. General Health included four questions rated on a 5-point Likert scale, such as "In general, would you say your health is..." (1 = excellent, 5 = poor) and "I seem to get sick a little easier than other people" (1 = definitely true, 5 = definitely false). Physical limitations were examined by four yes-no questions, such as, "During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health: Accomplished less than you would like" (yes/no). Physical functioning was measured using ten questions rated on a 3-point Likert scale, such as: "Does your health now limit you in climbing several flights of stairs?" (1 = yes, limited a lot, 3 = no, not limited at all). Bodily Pain was assessed by two questions rated on a 6-point Likert scale, such as "How much bodily pain have you had during the past 4 weeks?" (1 = none, 6 = very severe). Vitality was measured by four questions rated on a 6-point Likert scale, such as, "How much of the time during the past 4 weeks did you feel full of pep?" (1 = all of the time, 6 = none of the time). Emotional limitations were assessed using three yes/no questions, such as "During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious): Cut down the amount of time you spent on work or other activities?" (yes/no). Social functioning was measured by two questions rated on a 5-point Likert scale, such as "During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social

activities with family, friends, neighbors, or groups?” (1 = not at all, 5 = extremely). Last, mental health was assessed with five questions rated on a 6-point Likert scale, such as “How much of the time during the past 4 weeks have you been a nervous person?” (1 = all of the time, 5 = none of the time). The SF-36 will be used to verify that the participants report comparable levels of physical and mental health across age groups. Internal consistency was high for the SF-36 subscales generally exceeding .80. The exception was the social function subscale (alpha = .76). The SF-36 manual was used to calculate scores for each subscale. Items for each subscale were summed. Next a standardized score was created for each subscale ranging from 0 to 100 (Ware, Snow, Kosinski, & Gandek, 1993).

The Participant Information Form is a simple form that requested basic demographic information from participants such as gender, race, education, marital status, current medications, conditions for which they are currently being treated, recent hospitalizations, and any family history of cognitive impairment.

The Telephone Interview of Cognitive Status (TICS) is an 11-item dementia screen that can be administered in person or by telephone and takes between 5 and 10 minutes to complete (Brandt, Spencer & Folstein, 1988). Items include activities such as immediate recall of a 10-item word list, counting backwards from 20 to 1, and several orientation questions such as: “What is today’s date?” and “Who is the president of the United States?” The TICS has a maximum score of 41 points. The TICS was administered as needed during the follow-up phone call, that is, it was only administered as a check for dementia with participants who seemed to be confused during the call or who performed very poorly on the cognitive measures from the BTACT. A cutoff score of 30, out of a total possible score of 41 was utilized for dementia

exclusion. The TICS has exhibited high predictive value for the detection of impairment in previous research (Brandt, Spencer & Folstein, 1988) and has a test-retest coefficient of .97.

Identification of Domain Specific Possible Selves

Possible selves were categorized as noted above, to identify those individuals who had a cognitive self and/or a health self as one of their top 3 feared or top 3 hoped-for selves. To verify the centrality of these selves among individuals spontaneously reporting a cognitive or health self, an additional indicator was utilized. Participants had to rate the personal importance of that self with a 4 or better, on a seven-point Likert scale, at the time of the initial survey.

Analyses

Aim 1: Possible selves were coded for all individuals. The frequency and types of cognitive and health-related selves were compared among the different age groups using ANOVA and Chi-Square. We expected older adults to report a greater number of cognitive and health-related fears than younger adults, younger adults to report more cognitive and health-related hopes, and middle-aged adults to fall between the younger and older group.

Aim 2: Factor analyses were conducted to identify latent variables for self-perceived competence for cognition and health (SPCC and SPHC). The latent variable for SPCC consisted of the MIA, GME, and PSQ measures (See Figure 2.1). In Figure 2.1, MIA refers to the capacity, change and locus of control subscales of the MIA, GME refers to memory self-efficacy measured by the GME, and PSQ refers to the efficacy and outcome expectancy items on the Possible Selves Questionnaire. The latent variable for SPHC included the MHLC, HSE, and PSQ (See Figure 2.2). In Figure 2.2, HLC refers to health locus of control measured by the MHLC, HSE refers to health self-efficacy measured by the SRAHP, and PSQ refers to the efficacy and outcome expectancy items on the Possible Selves Questionnaire. Confirmatory factor analyses based on previous work by Diehl, Hastings, and Stanton (2001) were conducted

to identify positive and negative dimensions of PWB from the multiple indicators of each construct described above (See Figure 2.1 and Figure 2.2). In addition to factor analyses, ANOVAs were conducted to identify age differences in composite measures of SPC for health and cognition. Lower levels of SPC were expected among older adults. Based on age increases in the salience of cognition and health, we also expected SPC to be correlated more strongly with PWB (negative and positive) for the middle-aged and older adults than for the younger adults.

Aim 3: Structural equation modeling was used to test the proposed model in which SPC interacts with the presence of a domain-specific self to predict PWB. Positive PWB included the SES, + PANAS, and SPWB measures. SES refers to the self-esteem scale, + PANAS refers to the positive affect questions of the PANAS scale, and the SPWB refers to the Scales of Psychological Well-Being (Ryff, 1989). Negative PWB includes the CES-D, STAI, and - PANAS. The CES-D refers to the depression scale, the STAI is the state anxiety measure, and the - PANAS refers to the negative affect questions of the PANAS scale. Tentatively, we expected the relationship between a cognitive self, SPCC, and PWB to be stronger for older adults than for younger adults, because older adults generally report fewer possible selves and because the selves they do report are more often grounded within their current identities. We also examined the possibility that individuals with a feared cognitive self would show a relationship between SPCC and the negatively-valenced items for PWB, whereas individuals with a hoped-for cognitive self would show a relationship between SPCC and the positively-valenced items for PWB (See Figure 2.1). For the domain of cognition, we also tested the possible moderating effects of objective performance on this relationship, to determine whether actual cognitive performance contributed to the prediction of psychological well-being independently, or in interaction with SPCC. For the domain of health, the relationship between

self-perceived health competence SPHC and PWB was also tested for individuals reporting a health-related self. See Figure 2.2.

Power

Estimations of sample size and statistical power were considered for analyses of variance (ANOVAs) and structural equation analyses. Based on previous research, expected effect sizes are estimated to fall near .20 for self perceived competence and .25 for cognitive selves. According to Cohen (1988), adequate power at the .05 significance level to detect a medium effect size of .25 requires a total of 195 participants, with approximately 65 participants per age group. For structural equation analyses, Bentler (1985) suggested that the ratio between sample size and the number of estimated parameters should range from 5 to 10. The total sample size of the current study ($n = 339$) was more than adequate. However several analyses involved a subset of participants: analyses examining individuals identifying cognition as a most important hope or fear ($n = 92$) and analyses examining individuals identifying health as a most important hope or fear ($n = 213$). Although the number of participants included in the health analyses was adequate, the number of participants included in the cognitive analyses was low.

Table 2-1. Mean education and health ratings

Age group	Mean education	Standard deviation	Mean health	Standard deviation
Young	13.87	2.30	2.62	1.48
Middle	15.53	2.91	3.31	2.19
Old	14.13	2.86	3.72	2.09

N = 339

Table 2-2. Percentage of agreement between independent raters

Type of selves	Percentage agreement
Hoped-for	
Health	98%
Cognitive	99%
Feared	
Health	94%
Cognitive	95%

Note: Percentage agreement based on comparison of a randomly selected subset of possible selves data.

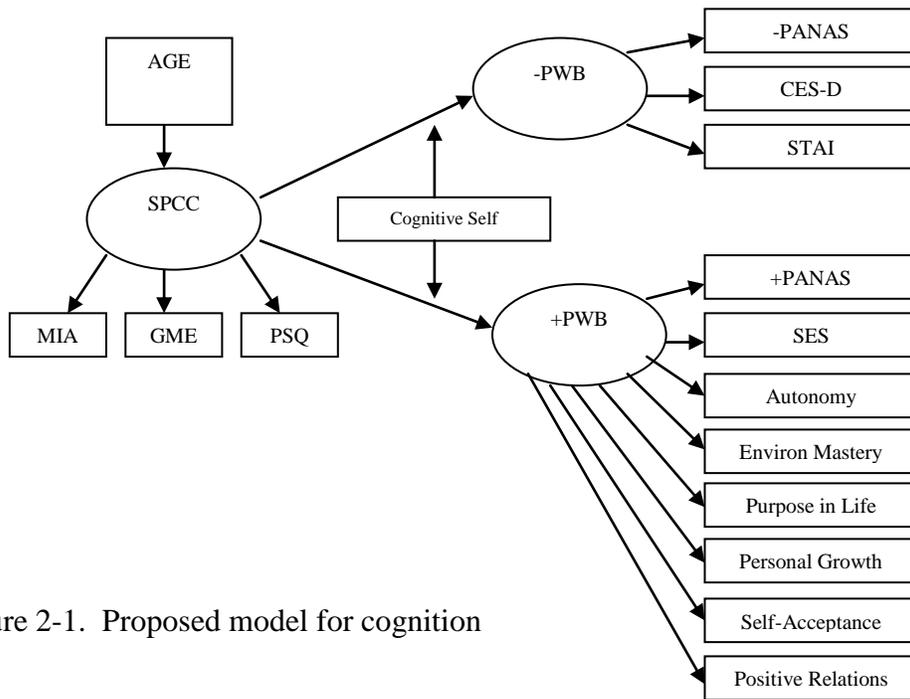


Figure 2-1. Proposed model for cognition

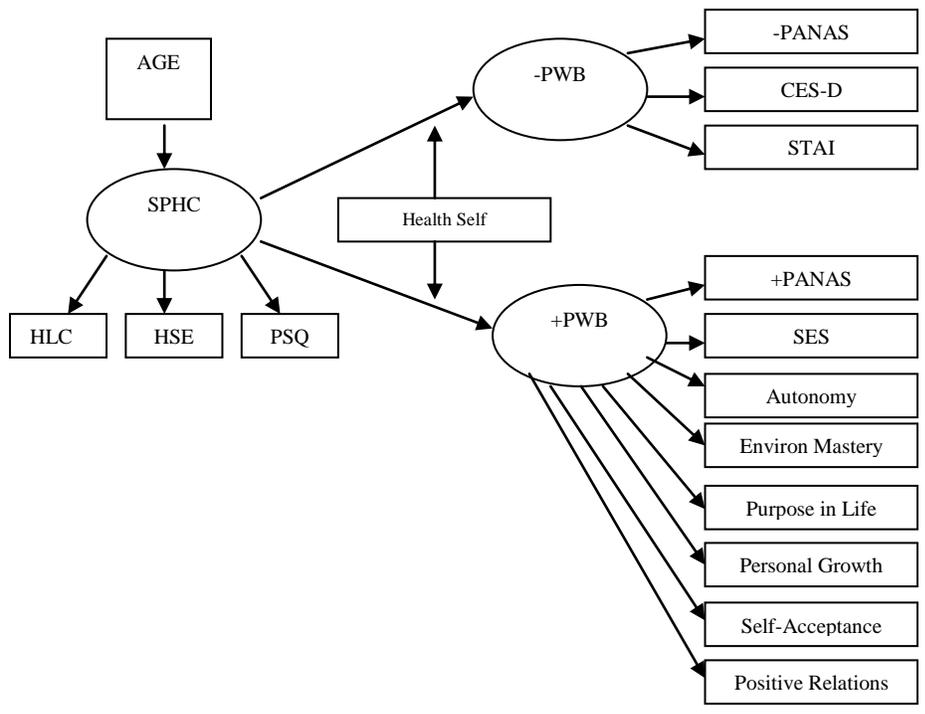


Figure 2-2. Proposed model for health

CHAPTER 3 PRELIMINARY ANALYSES

As mentioned above, our younger participants were recruited through the University of Florida's Research Participant Pool. These younger adults were given the option to recruit family members to participate in our study. This method of recruitment led to groups of related individuals who had participated in our study, for example a child, parent, and grandparent. A family group code was created so that each family group had a distinct code which could be used as a random factor in analyses of variance to examine these "family" differences. A univariate analysis of variance was then conducted to compare family groups across two basic demographic variables: years of education and general health, with family group entered as a random factor with and without age as a covariate. Family groups did not significantly differ on general health ratings, $F(1, 292) = 1.21, p < .05$; however, a significant difference was found for years of education with, $F(1, 292) = 1.34, p < .05$, or without, $F(1, 291) = 1.64, p < .05$, age in the analyses. Further examination of these differences revealed that some grandparents did not have a high school diploma; however many did. In addition to these differences, many parents had a high school diploma, some had a bachelor's degree and some an advanced degree.

Next, to ensure that younger adults who participated in our study and recruited family members were not significantly different from younger adults who participated and did not recruit family members, we also compared these two groups of students on years of education and general health. No significant differences were found for education $F(1, 68) = 1.94, p > .05$, or for health, $F(1, 68) = .007, p > .05$.

Analyses of variance were conducted to examine the number of spontaneous possible selves (hopes and fears) reported as a function of age group. Overall a significant difference was found for the total number of hopes, $F(2, 336) = 3.33, p < .05, \eta^2 = .020$, reported by each age

group. Younger adults reported a significantly greater number of hopes than older adults. There was no significant difference between the number of hopes reported by middle-aged and older adults. A significant difference was also found for the total number of fears, $F(2, 336) = 21.51$, $p < .001$, $\eta^2 = .114$, reported by each age group. Younger adults reported a significantly greater number of fears than both middle-aged and older adults. Again, there was no significant difference between the number of fears reported by middle-aged and older adults.

We also examined the possible selves (hopes and fears) most frequently reported by each age group (Table 3.1 and Table 3.2). We also examined the types of most important hopes and most dreaded fears reported by each age group (see Table 3.3 and Table 3.4). For younger adults, the most frequently nominated hopes were in the following domains: social, career, and life events; similarly, the most frequently nominated fears were social, other (e.g. hopes related to world peace), life events and finance. For middle-aged adults, the most frequently nominated hopes were in the following domains: health, social, other (e.g. hopes related to success of their children), and finance. The most frequently nominated fears were health, social, and life events. For older adults, the most frequently nominated hopes were: health, other (e.g. hopes related to the success of their children or grandchildren), social and cognitive miscellaneous; the most frequently nominated fears: health, dependency, and social.

Table 3-1. Number of individuals reporting types of selves by age group: Hopes

Self category	Younger adults	Middle-aged adults	Older adults
Personal traits	24	17	23
Health	34	60	80
Social	49	70	65
Career	77	54	33
Financial	37	62	43
Life events	62	29	27
Cognitive statements	1	2	7
Cognitive activities	5	13	22
Cognitive education	39	28	24
Cognitive miscellaneous	47	67	77
Memory	0	0	2
Dependency	3	7	18
Other	43	60	80

N = 339

Table 3-2. Number of individuals reporting types of selves by age group: Fears

Self category	Younger adults	Middle-aged adults	Older adults
Personal traits	32	20	8
Health	42	78	91
Social	60	58	50
Career	40	20	1
Financial	42	52	46
Life events	41	44	36
Cognitive statements	1	3	10
Cognitive activities	0	1	0
Cognitive education	23	0	0
Cognitive miscellaneous	3	1	3
Memory	0	13	12
Dependency	3	34	70
Other	56	38	48

N = 339

Table 3-3. Number of individuals reporting types of most important hopes by age group

Self category	Younger adults	Middle-aged adults	Older adults
Personal traits	22	13	19
Health	17	49	78
Social	39	65	64
Career	60	37	20
Financial	15	41	32
Life events	51	13	15
Cognitive statements	1	0	2
Cognitive activities	0	7	10
Cognitive education	22	12	15
Cognitive miscellaneous	12	39	58
Memory	0	0	1
Dependency	2	4	12
Other	29	43	68

N = 339

Table 3-4. Number of individuals reporting types of most important fears by age group

Self category	Younger adults	Middle-aged adults	Older adults
Personal traits	28	15	7
Health	25	84	95
Social	66	51	49
Career	18	11	1
Financial	29	37	37
Life events	29	38	31
Cognitive statements	0	3	7
Cognitive activities	0	0	0
Cognitive education	23	0	0
Cognitive miscellaneous	0	1	2
Memory	0	11	8
Dependency	1	23	65
Other	40	27	47

N = 339

CHAPTER 4 RESULTS: COGNITIVE

Initially, analyses of variance were conducted to examine the number of spontaneous cognitive selves reported, as a function of age group. In addition to the analyses of variance, chi square tests were also conducted, to determine whether the number of individuals listing cognitive selves differed significantly by age group. Significant group differences were identified in each case by using Tukey's post hoc tests at the .05 level. Confirmatory factor analyses were conducted and composite variables were created. Next, examination of the proposed structural equation models were carried out. Last, follow-up analyses of variance were conducted to examine differences in cognitive performance, memory beliefs, and psychological well-being by age group.

Cognitive Selves

An analysis of variance was conducted to examine whether the three age groups (young, middle, and old) differed by the total number of cognitive selves spontaneously listed. Cognitive selves included statements such as: "improving my grades," and "losing my memory." Overall a significant difference in the total number of cognitive selves reported by age group was found, $F(2, 336) = 4.10, p < .05, \eta^2 = .024$. Younger adults reported significantly more cognitive selves than middle-aged and older adults. There were no significant differences between middle-aged and older adults (see Table 4.1).

To further explore the spontaneous reports of cognitive selves, participants were divided into those who spontaneously mentioned a cognitive self and those who did not. Given that the total number of cognitive selves reported by each individual was typically small (between 0 and 2), we felt it was prudent to confirm these age differences by examining the frequency with which individuals reported a cognitive self as a function of age. To do this, a chi-square analysis

was conducted comparing those who reported no cognitive selves with those who reported at least one cognitive self, in relation to age group (young, middle, old). The results were significant, Pearson X^2 ($N = 337$, $df = 2$) = 9.21, $p < .05$. Follow-up comparisons revealed a significant difference between the number of younger and middle-aged adults reporting a cognitive self: Pearson X^2 ($N = 200$, $df = 1$) = 6.17, $p < .05$; as well as a significant difference between the number of younger and older adults reporting a cognitive self: Pearson X^2 ($N = 226$, $df = 1$) = 8.17, $p < .005$. In general a greater number of younger adults reported a cognitive self compared with middle-aged and older adults. No significant difference was found between number of middle-aged and older adults reporting a cognitive self: Pearson X^2 ($N = 248$, $df = 1$) = .08, $p > .05$ (see Table 4.2).

Next, a closer look at the types of cognitive selves (hoped-for or feared) reported by the three age groups was examined. An analysis of variance was conducted to examine whether the three age groups (young, middle, and old) differed by the total number of cognitive hopes spontaneously listed. No significant differences were found for cognitive hopes, $F(2, 336) = 1.88$, $p > .05$. An analysis of variance was also conducted to examine whether the three age groups (young, middle, and old) differed by the total number of cognitive fears spontaneously listed. Significant differences were found for cognitive fears, $F(2, 336) = 3.95$, $p < .05$, $\eta^2 = .023$. Younger adults reported a significantly greater number of cognitive fears than middle-aged and older adults. No differences were found between middle-aged and older adults (see Table 4.3).

To further examine the types of cognitive selves reported, participants were categorized into: those who reported cognitive hopes and those who did not, and those who reported cognitive fears and those who did not. A cross-tabulation of the three age groups (young,

middle-aged, old) by cognitive hope was significant: Pearson X^2 ($N = 337$, $df = 2$) = 7.51, $p < .05$. A cross-tabulation of the three age groups (young, middle-aged, old) by cognitive fear was also significant: Pearson X^2 ($N = 337$, $df = 2$) = 6.45, $p < .05$. Follow-up comparisons revealed a significant difference between the number of younger and middle-aged adults reporting a cognitive hope: Pearson X^2 ($N = 200$, $df = 1$) = 5.32, $p < .05$; and between the number of younger and middle-aged adults reporting a cognitive fear: Pearson X^2 ($N = 200$, $df = 1$) = 4.86, $p < .05$. A greater number of younger adults reported cognitive hopes and cognitive fears compared with middle-aged adults. A significant difference was also observed between the number of younger and older adults reporting a cognitive hope: Pearson X^2 ($N = 226$, $df = 1$) = 6.22, $p < .05$, and between the number of younger and older adults reporting a cognitive fear: Pearson X^2 ($N = 226$, $df = 1$) = 4.58, $p < .05$. Again, a greater number of younger adults reported cognitive hopes and cognitive fears compared to older adults. No significant difference was found between the number of middle-aged and older adults reporting a cognitive hope: Pearson X^2 ($N = 248$, $df = 1$) = .007, $p > .05$ or cognitive fear: Pearson X^2 ($N = 248$, $df = 1$) = .040, $p > .05$ (see Table 4.4).

Identifying Individuals for Whom Cognition is Important

Before continuing with the proposed analyses based on the selves that were spontaneously identified by our respondents, it was necessary to identify individuals who not only reported a cognitive possible self, but who also rated that self as highly important. Two requirements had to be met for a participant to be included. First, individuals who listed a cognitive hope or cognitive fear as one of their three most important hopes or most important fears were identified. From our study sample, 97 participants identified a cognitive self as one of their three most important hopes or three most important fears. Second, we examined how important these participants rated these cognitive selves on the possible selves questionnaire. For cognitive

hopes, participants were asked to rate the following statement on a 7-point Likert scale (1 = Not important at all, 7 = Very important): “How important is it to you to achieve this self?” For cognitive fears, participants were asked to rate the following statement on a 7-point Likert scale (1 = Not important at all, 7 = Very important): “How important is it to you to prevent the occurrence of this possible self?” If a participant rated the importance of their most important cognitive hope or fear lower than a 4, they were excluded from further analysis. These criteria resulted in the exclusion of 5 participants.

Measurement Model: Cognitive Competence

A factor analysis was conducted to identify a latent self-perceived cognitive competence factor proposed in Aim 2. General Memory Efficacy (GME), the capacity, change, and locus subscales of the Metamemory in Adulthood Scale, and PSQ (measured by the efficacy and outcome expectancy items answered for most important cognitive hopes and fears on the Possible Selves Questionnaire) were all expected to load on the Self-Perceived Cognitive Competence (SPCC) factor. These measures did not load on the hypothesized SPCC factor strongly (see Table 4.5 for factor loadings). Additional analyses were conducted to identify a SPCC factor using additional subscales of the Metamemory in Adulthood Scale (for example including anxiety and achievement subscales) and combinations of PSQ (for example including efficacy items only or outcome expectancy items only) without success. Subsequent analyses were therefore carried out with individual variables (PSQ and GME) representing SPCC.

Measurement Model: Psychological Well-Being

Factor analyses were also conducted to identify two latent psychological well-being factors (positive and negative). Negative Affect, Depression, and Anxiety were expected to load on the negative psychological well-being factor. The proposed negative psychological well-being variables loaded strongly and significantly on their proposed factor. See Table 4.6 for

standardized and unstandardized factor loadings. Positive Affect, Self-Esteem, and the six Scales of Psychological Well-Being (positive relations, personal growth, purpose in life, self-acceptance, environmental mastery, and autonomy) were expected to load on the positive psychological well-being factor. The proposed positive psychological well-being variables loaded strongly and significantly on their proposed factor. See Table 4.7 for standardized and unstandardized factor loadings.

Next, composite measures were created for both positive and negative well-being. Composite measures were created by first creating z-scores for each individual psychological well-being variable. Next these z-scores were regression-weighted by multiplying each z-score by the corresponding factor loading. Last the weighted scores for the individual scales were summed to create a composite measure.

An analysis of variance was conducted to examine whether the three age groups (young, middle, and old) differed on the composite measures of positive and negative psychological well-being. No significant differences were found between the three age groups for positive psychological well-being, $F(2, 90) = 1.75, p > .05$ or for negative well-being, $F(2, 90) = 2.42, p > .05$ (see Table 4.8), as expected.

Next we examined age differences in self-efficacy. An analysis of variance was conducted to examine whether the three age groups (young, middle, and old) differed on composite measures of General Memory Efficacy and PSQ. General Memory Efficacy included a sum across three memory efficacy items of the GME. The PSQ included the sum of the efficacy and outcome expectancy questions for each participants' most important cognitive selves from the Possible Selves Questionnaire. No significant differences were found between the three age groups for General Memory Efficacy, $F(2, 90) = .95, p > .05$. In contrast, a significant

difference was found for PSQ, $F(2, 90) = 5.17, p < .05, \eta^2 = .105$. As expected, younger adults reported significantly greater levels of efficacy and outcome expectancy for their most important cognitive selves than both middle-aged and older adults (see Table 4.9).

Last correlations were examined for General Memory Efficacy, PSQ, positive psychological well-being and negative psychological well-being for each age group. As expected, efficacy was more strongly correlated with psychological well-being for the middle-aged and older adults than for younger adults (see Tables 4.10 through 4.12).

Latent Variable Path Model

Next a latent variable path model was examined for individuals who identified a cognitive self as a most important hope or most dreaded fear. Based on the results of the factor analyses, the SPCC factor was removed from the original path model and instead General Memory Efficacy and PSQ were added as individual predictors (see Figure 4.1). Thus, the revised model proposed that age directly impacted both General Memory Efficacy and PSQ and that both General Memory Efficacy and PSQ directly impacted negative and positive psychological well-being. The fit of this original path model was poor. Modification indices suggested adding paths between positive and negative well-being and between GME and PSQ, as well as allowing several errors to covary. See Figure 4.2 for the modified model which includes the new paths (covariances are not pictured in the model). The Chi-square for the modified model was not significant, $X^2(66) = 76.70$, and goodness of fit indices indicated good fit: CFI = .981, RMSEA = .042. The effects of age on PSQ and the effects of General Memory Efficacy on PSQ were both significant. The effect of negative psychological well-being on positive psychological well-being was also significant. The remaining effects were not significant. Standardized and unstandardized effects are reported in Table 4.13.

Next we tested the model with objective cognitive performance as a predictor in the model to examine whether actual cognitive performance contributes to the prediction of psychological well-being (See Figure 4.3). Paths were added from age to cognitive performance and from cognitive performance to GME, positive psychological well-being and negative psychological well-being. The path from age to GME was removed because it was not significant in the previous model. Objective cognitive performance was measured by the immediate word list recall activity from the BTACT. The Chi-square for this model was not significant, $X^2(77) = 82.27$, and goodness of fit indices indicated good fit: CFI = .991, RMSEA = .027. Again, the effects of age on PSQ and the effects of General Memory Efficacy on PSQ were both significant. The effect of negative psychological well-being on positive psychological well-being was significant. The effects of cognitive performance on positive psychological well-being were also significant. The remaining effects, including the effect of age on cognitive performance and the effect of cognitive performance on General Memory Efficacy, were not significant. Standardized and unstandardized effects are reported in Table 4.14.

Next we examined a latent path model for individuals reporting cognitive hopes ($n = 56$) with the negative well-being factor excluded from the model (Figure 4.4). The Chi-square was not significant, $X^2(40) = 51.99$; however, the goodness of fit statistics indicated only moderately good fit: CFI = .938, RMSEA = .074. The effects of age on PSQ and the effects of General Memory Efficacy on PSQ were both significant. Standardized and unstandardized effects are reported in Table 4.15.

Last we examined a latent path model for individuals reporting cognitive fears ($n=42$) with the positive well-being factor excluded from the model (Figure 4.5). The Chi-Square was not significant, $X^2(8) = 6.31$, and goodness of fit indices indicated good fit: CFI = 1.00, RMSEA =

.000. The effects of age on PSQ and the effects of General Memory Efficacy on PSQ were both significant. Standardized and unstandardized effects are reported in Table 4.16.

Additional Analyses

In addition to the proposed analyses, several follow-up analyses were conducted. The purpose of these analyses was to examine age differences in cognitive ability, psychological well-being, and cognitive competence among individuals reporting important cognitive selves.

A multivariate analysis of variance was conducted to compare the three age groups (young, middle-aged, old) across the following dependent variables from the BTACT: word list recall, word list intrusions, and word list repetitions. Age differences were not significant, $F(6, 162) = .72, p > .05$ (see Table 4.17).

A multivariate analysis of variance was also conducted to compare the three age groups (young, middle-aged, old) across the following dependent variables: General Memory Efficacy and the Metamemory in Adulthood Scales (anxiety, achievement, capacity, change, and locus). Age differences were significant, $F(12, 168) = 3.65, p < .001, \eta^2 = .207$, and this significant result was further explored in univariate tests. Significant age differences were found for capacity, $F(2, 90) = 6.85, p < .005, \eta^2 = .135$, as younger adults reported higher levels of memory capacity than both middle-aged and older adults. Significant age differences were also found for change, $F(2, 90) = 14.12, p < .001, \eta^2 = .243$, as younger adults expected greater changes in their memory ability over time than both middle-aged and older adults. Last, significant age differences were found for anxiety, $F(2, 90) = 3.57, p < .05, \eta^2 = .075$; as older adults reported feeling greater anxiety related to memory tasks than both younger and middle-aged adults. No significant age differences were found for locus, achievement, or General Memory Efficacy (see Table 4.18).

Last, a multivariate analysis of variance was conducted to compare the three age groups (young, middle-aged, old) across the following dependent variables: depression, anxiety, negative affect, positive affect, self-esteem, autonomy, environmental mastery, purpose in life, personal growth, self-acceptance, and positive relations. As expected, age differences were not significant, $F(22, 158) = 1.39, p = .126$ (see Table 4.19).

Table 4-1. Mean number of cognitive selves reported by age group: Total

Age group	Mean number of cognitive selves	Standard deviation
Young	1.12	1.35
Middle	.68	1.01
Old	.74	1.18

N = 339

Table 4-2. Percentage of individuals reporting cognitive selves by age group

Age group	Yes cognitive self	No cognitive self
Young	61.8%	38.2%
Middle	44.1%	55.9%
Old	42.3%	57.7%

N = 339

Table 4-3. Mean number of cognitive selves by age group: Hopes and fears

Age group	Mean hopes	Standard deviation	Mean fears	Standard deviation
Young	.78	1.06	.35	.64
Middle	.51	.90	.16	.42
Old	.56	1.04	.18	.47

N = 339

Table 4-4. Type of cognitive selves reported by age group

Age group	Feared selves		Hoped-for selves	
	Yes	No	Yes	No
Young	27%	73%	49.4%	50.6%
Middle	14.4%	85.6%	33.3%	66.7%
Old	15.3%	84.7%	32.8%	67.2%

N = 339

Table 4-5. Factor loadings for self-perceived cognitive competence (SPCC)

Variable	Standardized loadings	Unstandardized loadings
PSQ	.323	1.00
Efficacy	.524	2.19
Locus	.408	2.47
Capacity	.907	12.45
Change	.804	14.07

N = 92

Table 4-6. Factor loadings for negative psychological well-being

Variable	Standardized loadings	Unstandardized loadings
Depression	.914	1.00
Anxiety	.852	1.21
Negative affect	.822	.645

N = 92

Table 4-7. Factor loadings for positive psychological well-being

Variable	Standardized loadings	Unstandardized loadings
Self-esteem	.823	1.00
Positive affect	.461	.881
Self-acceptance	.799	1.21
Environmental mastery	.802	1.23
Personal growth	.568	.689
Purpose in life	.693	.964
Positive relations	.577	.781
Autonomy	.631	.974

N = 92

Table 4-8. Mean scores on psychological well-being composites by age group

Age group	Mean PWB+	Standard deviation	Mean PWB-	Standard deviation
Young	-.67	4.33	.60	2.86
Middle	1.19	3.85	-.74	1.73
Old	-.26	3.61	.05	2.18

N = 92

Table 4-9. Mean cognitive efficacy scores by age group

Age group	Mean GME	Standard deviation	Mean PSQ	Standard deviation
Young	15.44	3.06	12.27	1.69
Middle	16.44	3.15	11.30	2.45
Old	15.59	2.73	10.59	2.15

N = 92

Table 4-10. Intercorrelations between efficacy and psychological well-being: Younger adults

	GME	PSQ	PWBneg	PWBpos
GME	---			
PSQ	.003 (32) P= .986	---		
PWBneg	.021 (32) P= .909	.187 (32) P= .305	---	
PWBpos	.059 (32) P= .748	-.041 (32) P= .822	-.630** (32) P= .000	---

N = 92. **Correlation is significant at the .01 level (2-tailed).

Table 4-11. Intercorrelations between efficacy and psychological well-being: Middle-aged adults

	GME	PSQ	PWBneg	PWBpos
GME	---			
PSQ	.345 (27) P= .068	---		
PWBneg	-.228 (27) P= .257	-.072 (27) P= .722	---	
PWBpos	.382* (27) P= .049	.336 (27) P= .086	-.585** (27) P= .001	---

N = 92. **Correlation is significant at the .01 level (2-tailed). *Correlation is significant at the .05 level (2-tailed).

Table 4-12. Intercorrelations between efficacy and psychological well-being: Older adults

	GME	PSQ	PWBneg	PWBpos
GME	---			
PSQ	.570** (32) P= .001	---		
PWBneg	-.170 (32) P= .352	-.279 (32) P= .122	---	
PWBpos	-.383** (32) P= .031	.299 (32) P= .096	-.774** (32) P= .000	---

N = 92. **Correlation is significant at the .01 level (2-tailed). *Correlation is significant at the .05 level (2-tailed).

Table 4-13. Latent path model: Cognition

Path	Standardized loadings	Unstandardized loadings
Age → GME	.025	.003
Age → PSQ	-.323	-.030*
GME → PSQ	.298	.220*
GME → +PWB	.157	.183
GME → -PWB	-.131	-.327
PSQ → +PWB	.087	.137
PSQ → -PWB	.013	.043
-PWB → +PWB	-.734	-.342*

N = 92. *Effect is significant at the .05 level.

Table 4-14. Latent path model: Cognition plus objective cognitive performance

Path	Standardized loadings	Unstandardized loadings
Age → Word list	-.068	-.007
Age → PSQ	-.323	-.030*
Word list → GME	-.007	-.009
Word list → +PWB	.167	.248*
Word list → -PWB	-.020	-.064
GME → PSQ	.298	.220*
GME → +PWB	.161	.187
GME → -PWB	-.130	-.326
PSQ → +PWB	.085	.133
PSQ → -PWB	.014	.047
-PWB → +PWB	-.729	-.340*

N = 92. *Effect is significant at the .05 level.

Table 4-15. Latent path model: Cognitive hopes excluding negative psychological well-being

Path	Standardized loadings	Unstandardized loadings
Age → PSQ	-.255	-.023*
GME → PSQ	.245	.178*
GME → +PWB	.208	.259
PSQ → +PWB	.071	.122

N = 92. *Effect is significant at the .05 level.

Table 4-16. Latent path model: Cognitive fears excluding positive psychological well-being

Path	Standardized loadings	Unstandardized loadings
Age → PSQ	-.531	-.049*
GME → PSQ	.316	.229*
GME → -PWB	-.273	-.463
PSQ → -PWB	.105	.246

N = 92. *Effect is significant at the .05 level.

Table 4-17. Mean word list recall by age group

Age group	Recall	Standard deviation	Intrusions	Standard deviation	Repetitions	Standard deviation
Young	8.31	1.97	.31	.71	.38	.73
Middle	7.38	2.39	.27	.53	.58	1.47
Old	7.77	2.76	.43	.77	.37	1.03

N = 92

Table 4-18. Mean memory efficacy and Metamemory in Adulthood Scale ratings by age group

Age group	Capacity	Standard deviation	Achieve.	Standard deviation	Anxiety	Standard deviation
Young	61.34	8.23	60.00	5.56	39.69	8.14
Middle	55.32	8.57	60.12	8.49	39.30	9.51
Old	53.14	10.41	61.16	7.59	44.47	7.86
Age group	Change	Standard deviation	Locus	Standard deviation	Efficacy	Standard deviation
Young	61.16	10.65	31.78	3.52	15.43	3.06
Middle	51.19	11.59	31.83	3.98	16.44	3.15
Old	46.94	10.69	30.94	5.21	15.59	2.73

N = 92

Table 4-19. Mean psychological well-being ratings by age group

Age group	Depression	Standard deviation	Anxiety	Standard deviation	Negative affect	Standard deviation
Young	11.47	10.01	34.56	12.54	18.50	6.76
Middle	7.75	6.50	29.28	9.40	14.81	4.57
Old	9.66	7.57	33.85	9.57	16.39	5.82

Age group	Positive affect	Standard deviation	Self esteem	Standard deviation	Autonomy	Standard deviation
Young	37.31	6.46	33.81	4.60	31.63	5.67
Middle	36.81	5.88	36.44	3.68	34.37	5.11
Old	34.96	7.36	34.52	3.87	32.71	5.06

Age group	Environ mastery	Standard deviation	Personal growth	Standard deviation	Positive relations	Standard deviation
Young	30.41	4.94	35.59	4.49	35.00	4.41
Middle	35.00	5.20	35.41	3.69	34.96	5.31
Old	33.12	5.02	34.51	4.39	35.25	4.60

Age group	Purpose in life	Standard deviation	Self accept	Standard deviation
Young	35.53	5.00	33.31	5.52
Middle	36.93	5.46	34.52	5.15
Old	36.23	4.12	32.73	5.13

N = 92

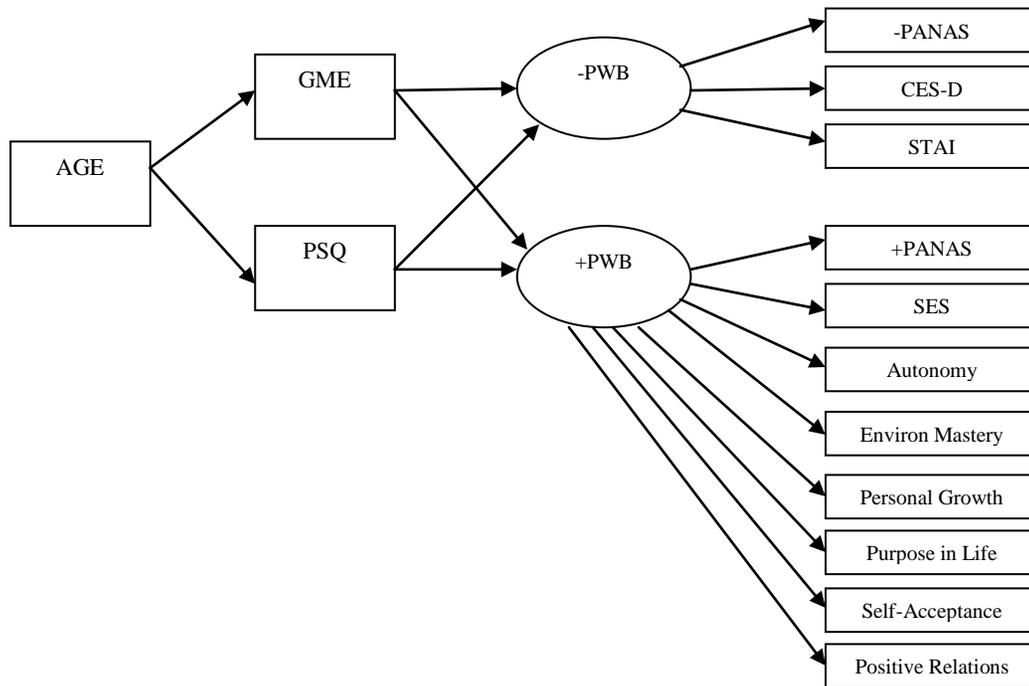


Figure 4-1. Latent path model for cognition

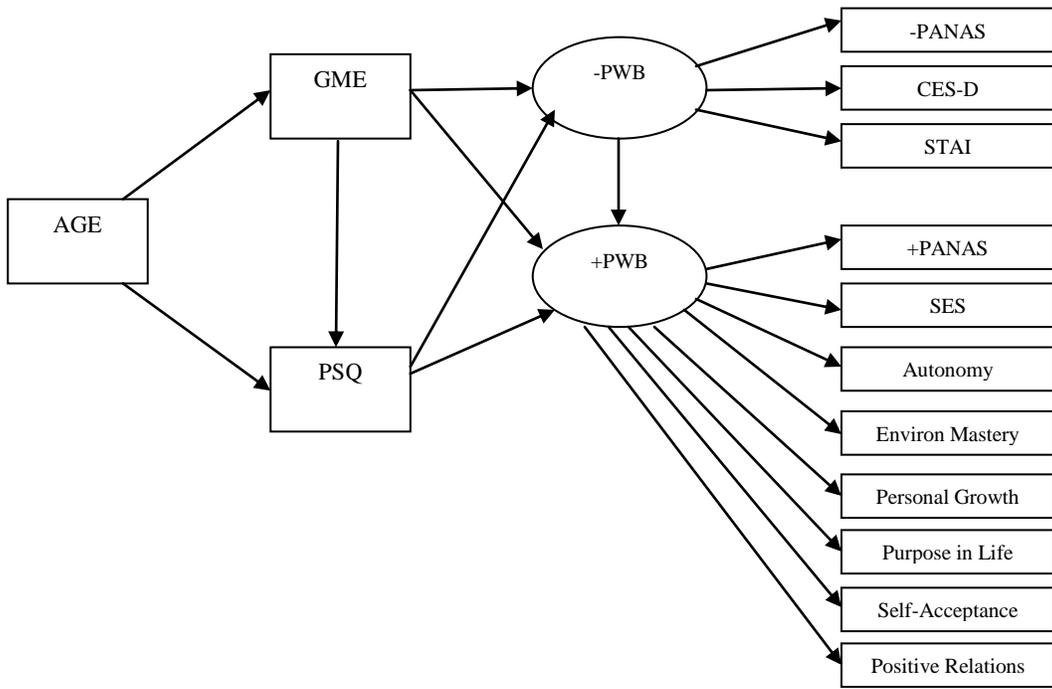


Figure 4-2. Modified latent path model for cognition

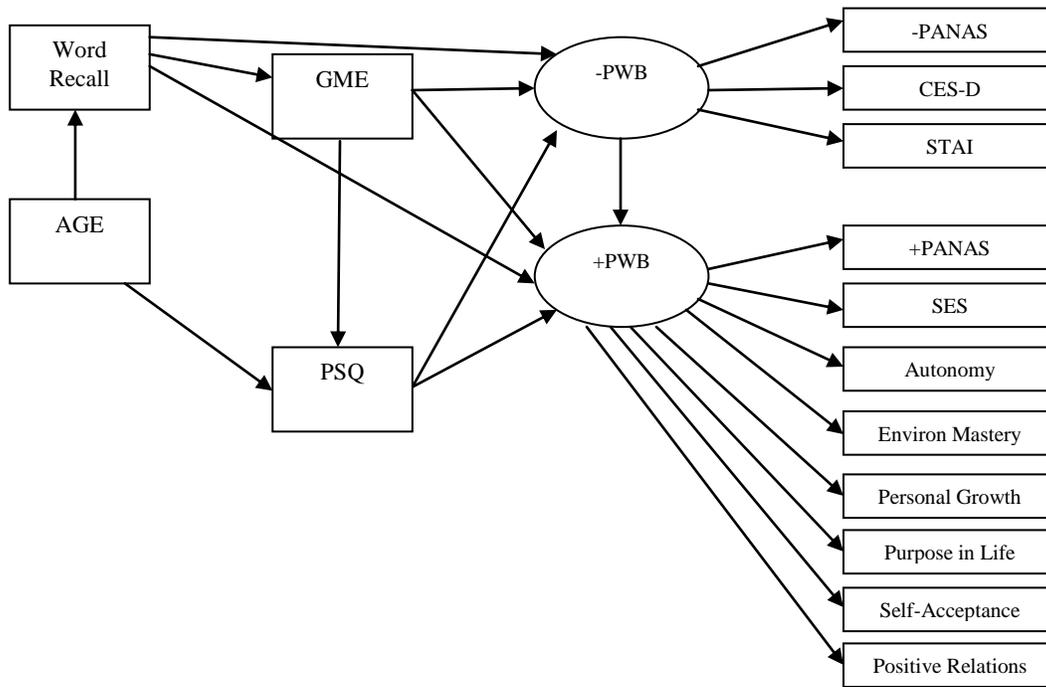


Figure 4-3. Modified latent path model for cognition with objective performance

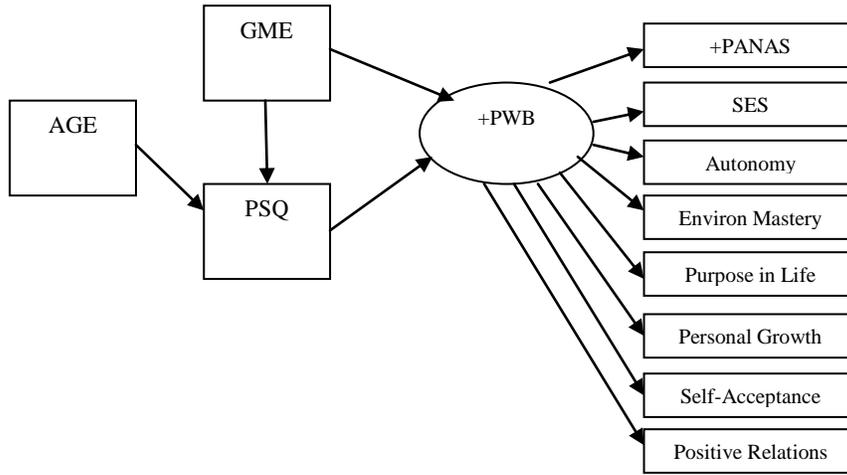


Figure 4-4. Latent path model for cognitive hopes and positive psychological well-being

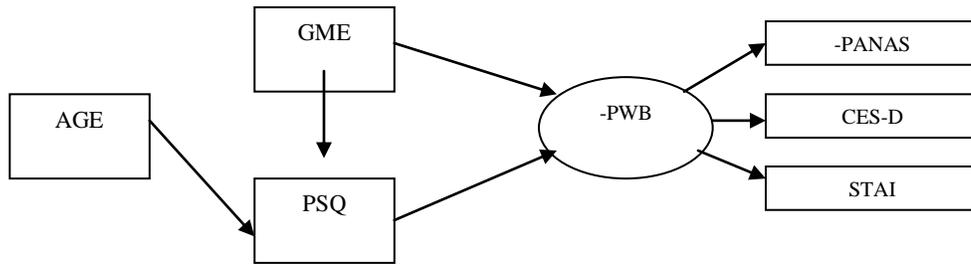


Figure 4-5. Latent path model for cognitive fears and negative psychological well-being

CHAPTER 5 RESULTS: HEALTH

Analyses of variance were conducted to examine the number of spontaneous health selves reported, as a function of age group. In addition to the analyses of variance, chi square tests were also conducted, to determine whether the number of individuals listing these health selves differed significantly by age group. Significant group differences were identified in each case by using Tukey's post hoc tests at the .05 level. Confirmatory factor analyses were conducted and composite variables were created. Next, examination of the proposed structural equation models was carried out. Last, follow-up analyses of variance were conducted to examine differences in health, health beliefs, and psychological well-being by age group.

Health Selves

An analysis of variance was conducted to examine whether the three age groups (young, middle, and old) differed by the total number of health selves spontaneously listed. Health selves included items such as: "staying healthy," and "having a stroke." Overall a significant difference in the total number of health selves reported by age group was found, $F(2, 338) = 3.04, p < .05, \eta^2 = .018$. Younger adults reported significantly fewer health selves than middle-aged adults. There were no significant differences between middle-aged and older adults, or between younger and older adults (see Table 5.1) which was not expected.

To further explore the spontaneous reports of health selves, participants were divided into those who spontaneously mentioned a health self and those who did not. Given that the total number of health selves reported by each individual was typically small (between 0 and 3), we felt it was prudent to confirm these age differences by examining the frequency with which individuals reported a health self as a function of age. To do this, a chi-square analysis was conducted comparing those who reported no health selves with those who reported at least one

health self, in relation to age group (young, middle, and old). The results were significant, Pearson X^2 ($N = 339$, $df = 2$) = 17.26, $p < .001$, further supporting the notion that these age groups did differ in their spontaneous report of health selves (see Table 5.2). Follow-up comparisons revealed a significant difference between the number of younger and middle-aged adults reporting a health self: Pearson X^2 ($N = 201$, $df = 1$) = 8.91, $p < .005$; as well as a significant difference between the number of younger and older adults reporting a health self: Pearson X^2 ($N = 228$, $df = 1$) = 15.46, $p < .001$. No significant difference was found between number of middle-aged and older adults reporting a health self: Pearson X^2 ($N = 249$, $df = 1$) = .67, $p > .05$ (see Table 5.2). Overall, a greater number of older adults reported health selves, followed by middle-aged and younger adults respectively.

Next, a closer look at the types of health selves (hoped-for or feared) reported by the three age groups was examined. An analysis of variance was conducted to examine whether the three age groups (young, middle, and old) differed by the total number of health hopes spontaneously listed. No significant differences were found for health hopes, $F(2, 338) = 1.34$, $p > .05$. An analysis of variance was also conducted to examine whether the three age groups (young, middle, and old) differed by the total number of health fears spontaneously listed. Significant differences were found for health fears, $F(2, 338) = 3.07$, $p < .05$, $\eta^2 = .018$. Middle-aged adults reported a significantly greater number of health fears than younger adults. No differences were found between middle-aged and older adults or between younger or older adults (see Table 5.3) which was unexpected.

To further examine the types of health selves reported, participants were categorized into: those who reported health hopes and those who did not, and those who reported health fears and those who did not. A cross-tabulation of the three age groups (young, middle-aged, old) by

health hope was significant: Pearson X^2 ($N = 339$, $df = 2$) = 9.38, $p < .05$. A cross-tabulation of the three age groups (young, middle-aged, old) by health fear was also significant: Pearson X^2 ($N = 339$, $df = 2$) = 13.14, $p < .001$. Follow-up comparisons revealed a significant difference between the number of younger and middle-aged adults reporting a health hope: Pearson X^2 ($N = 201$, $df = 1$) = 5.29, $p < .05$; and between the number of younger and middle-aged adults reporting a health fear: Pearson X^2 ($N = 201$, $df = 1$) = 11.51, $p < .005$. A significant difference was also observed between the number of younger and older adults reporting a health hope: Pearson X^2 ($N = 228$, $df = 1$) = 8.89, $p < .005$, and between the number of younger and older adults reporting a health fear: Pearson X^2 ($N = 228$, $df = 1$) = 8.33, $p < .005$. No significant difference was found between the number of middle-aged and older adults reporting a health hope: Pearson X^2 ($N = 249$, $df = 1$) = .383, $p > .05$, or a health fear: Pearson X^2 ($N = 249$, $df = 1$) = .529, $p > .05$ (see Table 5.4). Again, a greater number of older adults reported health hopes and health fears as expected.

Identifying Individuals for Whom Health is Important

Before continuing with the analyses of the proposed model, it was necessary to identify individuals who not only reported a health-related possible self, but who also rated that self as highly important. Two requirements had to be met for a participant to be included. First, individuals who listed a health hope or health fear as one of their three most important hopes or most important fears were identified. From our study sample, 220 participants identified a health self as one of their three most important hopes or three most important fears. Second, we examined how important these participants rated these health selves on the possible selves questionnaire. For health hopes, participants were asked to rate the following statement on a 7-point Likert scale (1 = Not important at all, 7 = Very important): “How important is it to you to achieve this self?” For health fears, participants were asked to rate the following statement on a

7-point Likert scale (1 = Not important at all, 7 = Very important): “How important is it to you to prevent the occurrence of this possible self?” If a participant rated the importance of their most important health hope or fear lower than a 4, they were excluded from further analysis. These criteria resulted in the exclusion of 5 participants.

Measurement Model: Health Competence

A factor analysis was conducted to identify a latent self-perceived health competence factor proposed in Aim 2. Health Self-Efficacy (measured by the Self-Rated Abilities for Health Practices Scale: SRAHP), Health Locus of Control (measured by the Internal Control subscale of the Multidimensional Health Locus of Control Form B: MHLCB), and PSQ (measured by the efficacy and outcome expectancy items answered for most important hopes and fears on the Possible Selves Questionnaire) were all expected to load on the Self-Perceived Health Competence (SPHC) factor. These measures did not load on the hypothesized SPHC factor strongly (see Table 5.5 for factor loadings). Additional analyses were conducted to identify a SPHC factor using individual subscales of the SRAHP (nutrition, exercise, responsible health practices, stress reduction) and combinations of PSQ (for example including efficacy items only or outcome expectancy items only) without success. Subsequent analyses were therefore carried out with individual variables (Health Self-Efficacy and PSQ) representing SPHC.

Measurement Model: Psychological Well-Being

Factor analyses were also conducted to identify two latent psychological well-being factors (positive and negative). Although these factor analyses had confirmed a negative and positive well-being factor for the earlier analyses, those earlier analyses were conducted with a different sample—this was a sample of individuals with health selves in contrast to the earlier sample representing those with cognitive selves. As such, these analyses represented a further confirmation of these well-being factors. Negative Affect, Depression, and Anxiety were

expected to load on the negative psychological well-being factor. The proposed negative psychological well-being variables loaded strongly and significantly on their proposed factor. See Table 5.6 for standardized and unstandardized factor loadings. Positive Affect, Self-Esteem, and the six Scales of Psychological Well-Being (positive relations, personal growth, purpose in life, self-acceptance, environmental mastery, and autonomy) were expected to load on the positive psychological well-being factor. The proposed positive psychological well-being variables loaded strongly and significantly on their proposed factor. See Table 5.7 for standardized and unstandardized factor loadings.

Next, composite measures were created for both positive and negative well-being. Composite measures were created by first creating z-scores for each individual psychological well-being variable. Next these z-scores were regression-weighted by multiplying each z-score by the corresponding factor loading. Last the weighted scores for the individual scales were summed to create a composite measure.

An analysis of variance was conducted to examine whether the three age groups (young, middle, and old) differed on the composite measures of positive and negative psychological well-being. As expected, no significant differences were found between the three age groups for positive psychological well-being, $F(2, 217) = 1.88, p > .05$. In contrast, a significant difference was found for negative psychological well-being, $F(2, 217) = 5.33, p < .005, \eta^2 = .047$. Younger adults reported significantly greater levels of negative well-being than middle-aged and older adults (see Table 5.8).

Next we examined age differences in self-efficacy. An analysis of variance was conducted to examine whether the three age groups (young, middle, and old) differed on composite measures of Health Self-Efficacy and PSQ. Health Self-Efficacy included a sum across four

health efficacy scales including nutrition, exercise, stress management, and responsible health practices. The PSQ included the sum of the efficacy and outcome expectancy questions for each participants' most important health selves from the Possible Selves Questionnaire. No significant differences were found between the three age groups for Health Self-Efficacy, $F(2, 217) = 2.77, p > .05$. In contrast, a significant difference was found for PSQ, $F(2, 217) = 6.69, p < .005, \eta^2 = .059$. Younger adults reported significantly greater levels of efficacy and outcome expectancy for their most important health selves than both middle-aged and older adults (see Table 5.9).

Last correlations were examined for Health Self-Efficacy, PSQ, positive psychological well-being and negative psychological well-being for each age group. As expected, efficacy was more strongly correlated with psychological well-being for the middle-aged and older adults than for younger adults (see Tables 5.10 through 5.12).

Latent Variable Path Model

Next a latent variable path model was examined for individuals who identified a health self as a most important hope or most dreaded fear. Based on the results of the factor analyses, the SPHC factor was removed from the original path model and instead Health Self-Efficacy and PSQ were added as individual predictors (see Figure 5.1). Thus, the revised model proposed that age directly impacted both Health Self-Efficacy and PSQ and that both Health Self-Efficacy and PSQ directly impacted negative and positive psychological well-being. The fit of this original path model was poor. Modification indices suggested adding paths from age to both positive and negative psychological well-being, from Health Self-Efficacy to PSQ, and from negative well-being to positive well-being as well as allowing several errors to covary. See Figure 5.2 for the modified model (covariances are not pictured in the model).

The effects of the modified path model are mixed. The Chi-square was significant, $X^2 (58) = 122.02$; however, goodness of fit indices indicated only moderately acceptable fit: CFI = .957, RMSEA = .072. The effects of Health Self-Efficacy on PSQ, positive psychological well-being and negative psychological well-being were all significant. The effects of age on both Health Self-Efficacy and negative psychological well-being were significant, and the effects of negative psychological well-being on positive psychological well-being were also significant. The remaining effects of age on Health Self-Efficacy and positive psychological well-being, as well as the effects of PSQ on both positive and negative psychological well-being were not significant. Standardized and unstandardized effects are reported in Table 5.13.

Next we examined a latent path model for individuals reporting health hopes ($n=126$) with the negative well-being factor excluded from the model (Figure 5.3). The Chi-square was significant, $X^2 (35) = 80.23$, and goodness of fit statistics indicated poor fit: CFI = .927, RMSEA = .102. Standardized and unstandardized effects are reported in Table 5.14.

Last we examined a latent path model for individuals reporting health fears ($n=169$) with the positive well-being factor excluded from the model (Figure 5.4). The Chi-Square, $X^2 (6) = 8.47$, was not significant, and Goodness of fit indices indicated good fit: CFI = .993, RMSEA = .049. The effects of the path model are largely significant. The exceptions are the non-significant paths of age on Health Self-Efficacy and PSQ on negative psychological well-being. Standardized and unstandardized effects are reported in Table 5.15.

Additional Analyses

In addition to the proposed analyses, several follow-up analyses were conducted. The purpose of these analyses was to examine age differences in health, psychological well-being, and health competence among individuals reporting important health selves.

A multivariate analysis of variance was conducted to compare the three age groups (young, middle-aged, old) across the following dependent variables from the SF-36: general health, physical functioning, role physical, pain, vitality, social, role emotional, and mental health. Age differences were significant, $F(16, 416) = 5.75$, $p < .001$, $\eta^2 = .181$, and this significant result was further explored in univariate tests.

Significant age differences were found for physical functioning, $F(2, 216) = 14.06$, $p < .001$, $\eta^2 = .116$, and role physical subscales, $F(2, 216) = 3.95$, $p < .05$, $\eta^2 = .036$, due to the fact that older adults reported experiencing poorer physical functioning than both the younger and middle-aged adults. Significant age differences were also found for pain, $F(2, 216) = 3.26$, $p < .05$, $\eta^2 = .030$; as older adults reported experiencing more pain than younger adults. Next, significant age differences were found for role emotional, $F(2, 216) = 7.76$, $p < .005$, $\eta^2 = .068$ and mental health subscales, $F(2, 216) = 6.24$, $p < .005$, $\eta^2 = .055$, as younger adults reported poorer emotional and mental health than both middle-aged and older adults. No significant age differences were found for the general health, vitality, or social subscales of the SF-36 (see Table 5.16).

A multivariate analysis of variance was also conducted to compare the three age groups (young, middle-aged, old) across the following dependent variables: Health Self-Efficacy for nutrition, exercise, stress management, and responsible health practices, and Health Locus of Control which included internal, chance and powerful others subscales. Age differences were significant, $F(14, 376) = 3.81$, $p < .001$, $\eta^2 = .124$, and this significant result was further explored in univariate tests.

A univariate analysis of variance examining overall Health Self-Efficacy as a function of age group was not significant, $F(2, 206) = 2.81$, $p > .05$. When examining the individual

subscales, significant age differences were found for nutrition self-efficacy, $F(2, 195) = 3.78$, $p < .05$, $\eta^2 = .038$, due to the fact that younger adults reported feeling significantly less capable of maintaining a healthy diet than the middle-aged adults. Significant age differences were also found for exercise self-efficacy, $F(2, 195) = 5.23$, $p < .05$, $\eta^2 = .051$; as older adults reported feeling less capable of engaging in regular exercise than both younger and middle-aged adults. Next, significant age differences were found for responsible health practices, $F(2, 195) = 3.25$, $p < .05$, $\eta^2 = .033$, as younger adults reported feeling less capable of taking care of their own health than middle-aged adults. Last, significant age differences were found for the powerful others subscale, $F(2, 195) = 9.66$, $p < .001$, $\eta^2 = .091$, as older adults reported that powerful others exerted greater control over their personal health than did both younger and middle-aged adults. No significant age differences were found for self-efficacy for stress management or for the internal control or chance subscales of the Health Locus of Control measure (see Table 5.17).

Last, a multivariate analysis of variance was conducted to compare the three age groups (young, middle-aged, old) across the following dependent variables: depression, anxiety, negative affect, positive affect, self-esteem, autonomy, environmental mastery, purpose in life, personal growth, self-acceptance, and positive relations. Age differences were significant, $F(122, 360) = 2.77$, $p < .001$, $\eta^2 = .145$, and this significant result was further explored in univariate tests.

Significant age differences were found for depression, $F(2, 191) = 5.08$, $p < .05$, $\eta^2 = .051$, due to the fact that younger adults reported experiencing a significantly greater degree of depressive symptoms than both middle-aged and older adults. Middle-aged and older adults did not significantly differ from one another. Significant age differences were also found for negative affect, $F(2, 191) = 5.33$, $p < .05$, $\eta^2 = .053$; again younger adults reported

experiencing greater levels of negative affect than both middle-aged and older adults. Next, significant age differences were found for autonomy, $F(2, 191) = 5.15, p < .05, \eta^2 = .052$, and environmental mastery, $F(2, 191) = 6.57, p < .05, \eta^2 = .065$ as younger adults reported less autonomy and less environmental mastery than both middle-aged and older adults. Significant age differences were also found for personal growth, $F(2, 191) = 5.01, p < .05, \eta^2 = .050$, as older adults reported lower levels of personal growth than both younger and middle-aged adults. Last, significant differences were found for positive relations, $F(2, 191) = 3.37, p < .05, \eta^2 = .034$, as older adults reported greater engagement in positive relations with others than younger adults. No significant age differences were found for positive affect, self-esteem, purpose in life, self-acceptance, or anxiety (see Table 5.18).

Table 5-1. Mean number of health selves reported by age group: Total

Age group	Mean number of health selves	Standard deviation
Young	1.57	1.88
Middle	2.18	1.98
Old	1.91	1.45

N = 339

Table 5-2. Percentage of individuals reporting health selves by age group

Age group	Yes health self	No health self
Young	60%	40%
Middle	79.3%	20.7%
Old	83.3%	16.7%

N = 339

Table 5-3. Mean number of health selves by age group: Hopes and fears

Age group	Mean hopes	Standard deviation	Mean fears	Standard deviation
Young	.72	1.33	.84	1.12
Middle	.97	1.19	1.21	1.15
Old	.89	1.03	.97	.95

N = 339

Table 5-4. Type of health selves reported by age group

Age group	Feared selves		Hoped-for selves	
	Yes	No	Yes	No
Young	46.7%	53.3%	37.8%	62.2%
Middle	70.3%	29.7%	54.1%	45.9%
Old	65.9%	34.1%	58%	42%

N = 339

Table 5-5. Factor loadings for self-perceived health competence (SPHC)

Variable	Standardized loadings	Unstandardized loadings
Self-efficacy	.430	1.00
Locus of control	.447	6.09
PSQ	.531	1.43

N = 215

Table 5-6. Factor loadings for negative psychological well-being

Variable	Standardized loadings	Unstandardized loadings
Depression	.913	1.00
Anxiety	.810	1.10
Negative affect	.842	.671

N = 215

Table 5-7. Factor loadings for positive psychological well-being

Variable	Standardized loadings	Unstandardized loadings
Self-esteem	.843	1.00
Positive affect	.560	1.06
Self-acceptance	.848	1.04
Environmental mastery	.819	1.27
Personal growth	.579	.84
Purpose in life	.662	.75
Positive relations	.547	.98
Autonomy	.650	1.40

N = 215

Table 5-8. Mean scores on psychological well-being composites by age group

Age group	Mean PWB+	Standard deviation	Mean PWB-	Standard deviation
Young	-1.34	4.24	1.17	2.74
Middle	.28	4.46	.0005	2.41
Old	.22	4.10	-.36	2.05

N = 215

Table 5-9. Mean health efficacy scores by age group

Age group	Mean HSE	Standard deviation	Mean PSQ	Standard deviation
Young	89.16	15.56	12.08	2.17
Middle	93.24	14.67	10.60	2.25
Old	87.85	16.60	10.42	2.33

N = 215

Table 5-10. Intercorrelations between efficacy and psychological well-being: Younger adults

	PWBneg	PWBpos	PSQ	HSE
PWBneg	---			
PWBpos	-.555* (32) P= .001	---		
PSQ	.080 (32) P= .664	-.112 (32) P= .543	---	
HSE	-.191 (32) P= .295	.286 (32) P= .113	.207 (32) P= .255	---

N = 215. **Correlation is significant at the .01 level (2-tailed). *Correlation is significant at the .05 level (2-tailed).

Table 5-11. Intercorrelations between efficacy and psychological well-being: Middle-aged adults

	PWBneg	PWBpos	PSQ	HSE
PWBneg	---			
PWBpos	-.645* (84) P= .000	---		
PSQ	-.255* (84) P= .019	.316** (84) P= .003	---	
HSE	-.450 (84) P= .000	.445** (84) P= .000	.116 (84) P= .295	---

N = 215. **Correlation is significant at the .01 level (2-tailed). *Correlation is significant at the .05 level (2-tailed).

Table 5-12. Intercorrelations between efficacy and psychological well-being: Older adults

	PWBneg	PWBpos	PSQ	HSE
PWBneg	---			
PWBpos	-.718** (102) P= .000	---		
PSQ	-.214* (102) P= .031	.336** (102) P= .001	---	
HSE	-.373** (102) P= .000	.580** (102) P= .000	.334** (102) P= .001	---

N = 215. **Correlation is significant at the .01 level (2-tailed). *Correlation is significant at the .05 level (2-tailed).

Table 5-13. Latent path model: Health

Path	Standardized loadings	Unstandardized loadings
Age → Health efficacy	-.055	-.046*
Age → PSQ	-.204	-.024
Age → +PWB	.055	.008
Age → -PWB	-.264	-.111*
Health efficacy → PSQ	.235	.033*
Health efficacy → +PWB	.233	.053*
Health efficacy → -PWB	-.349	-.164*
PSQ → +PWB	.093	.150
PSQ → -PWB	-.097	-.319
-PWB → +PWB	-.657	-.324*

N = 215. *Effect is significant at the .05 level.

Table 5-14. Latent path model: Health hopes excluding negative psychological well-being

Path	Standardized loadings	Unstandardized loadings
Age → Health efficacy	-.091	-.080
Age → PSQ	-.174	-.021*
Age → +PWB	.276	.061*
Health efficacy → PSQ	.350	.047*
Health efficacy → +PWB	.416	.104*
PSQ → +PWB	.300	.560*

N = 215. *Effect is significant at the .05 level.

Table 5-15. Latent path model: Health fears excluding positive psychological well-being

Path	Standardized loadings	Unstandardized loadings
Age → Health efficacy	-.051	-.046
Age → PSQ	-.206	-.025*
Age → -PWB	-.247	-.105*
Health efficacy → PSQ	.209	.028*
Health efficacy → -PWB	-.356	-.167*
PSQ → -PWB	-.105	-.368

N = 215. *Effect is significant at the .05 level.

Table 5-16. Mean SF-36 ratings by age group

Age group	Physical function	Standard deviation	Role physical	Standard deviation	Pain	Standard deviation
Young	92.27	15.62	89.39	25.79	79.52	21.47
Middle	82.78	25.64	84.88	33.93	70.77	24.24
Old	68.59	26.89	73.30	37.42	67.48	23.72
Age group	General health	Standard deviation	Vitality	Standard deviation	Social	Standard deviation
Young	73.91	24.94	55.61	17.89	78.41	25.05
Middle	75.17	23.12	62.22	21.97	84.72	22.71
Old	73.47	21.67	63.11	18.87	86.04	22.02
Age group	Role emotion	Standard deviation	Mental health	Standard deviation		
Young	57.58	42.71	70.18	14.56		
Middle	85.19	31.18	75.46	17.66		
Old	80.58	34.15	80.54	14.03		

N = 215

Table 5-17. Mean health efficacy and locus of control ratings by age group

Age group	Nutrition	Standard deviation	Exercise	Standard deviation	Stress mgmt	Standard deviation
Young	21.97	5.24	22.36	4.34	21.52	4.66
Middle	24.40	3.91	21.87	5.91	22.15	4.91
Old	23.26	4.34	19.13	7.12	21.70	4.88

Age group	Health practices	Standard deviation	Internal control	Standard deviation	Chance	Standard deviation
Young	22.89	4.97	26.40	3.59	16.73	4.24
Middle	24.95	3.49	26.36	4.28	16.33	5.44
Old	24.59	3.91	25.89	4.63	15.24	5.09

Age group	Powerful others	Standard deviation
Young	17.61	3.81
Middle	18.92	5.26
Old	21.80	5.96

N = 215

Table 5-18. Mean psychological well-being ratings by age group

Age group	Depression	Standard deviation	Anxiety	Standard deviation	Negative affect	Standard deviation
Young	13.00	10.19	34.27	10.06	19.24	7.24
Middle	8.82	8.90	31.70	10.18	15.98	6.31
Old	7.58	6.92	29.97	10.09	15.24	5.24

Age group	Positive affect	Standard deviation	Self esteem	Standard deviation	Autonomy	Standard deviation
Young	34.64	7.65	33.33	4.96	29.12	6.80
Middle	36.07	6.57	34.56	4.65	32.55	5.81
Old	34.91	7.19	34.43	4.16	32.93	5.76

Age group	Environ mastery	Standard deviation	Personal growth	Standard deviation	Positive relations	Standard deviation
Young	30.21	5.35	35.67	4.31	33.36	4.31
Middle	33.15	6.26	34.90	5.32	35.25	5.91
Old	34.38	5.13	32.72	5.81	36.03	4.43

Age group	Purpose in life	Standard deviation	Self accept	Standard deviation
Young	36.30	5.31	32.33	5.97
Middle	36.71	5.66	33.40	6.84
Old	36.78	5.43	34.00	5.64

N = 215

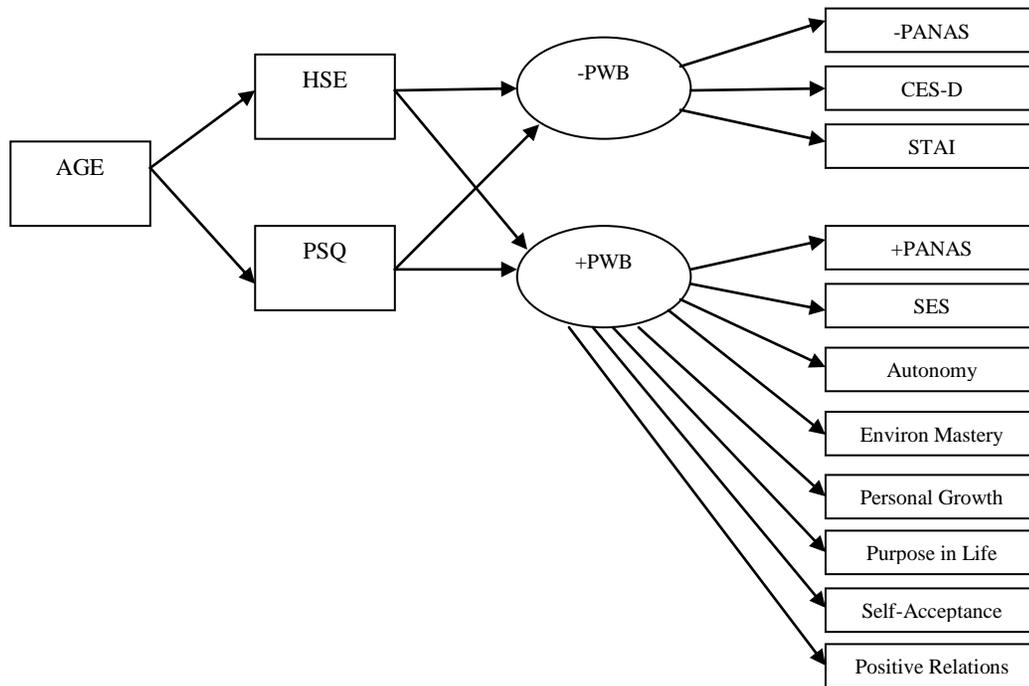


Figure 5-1. Latent path model for health

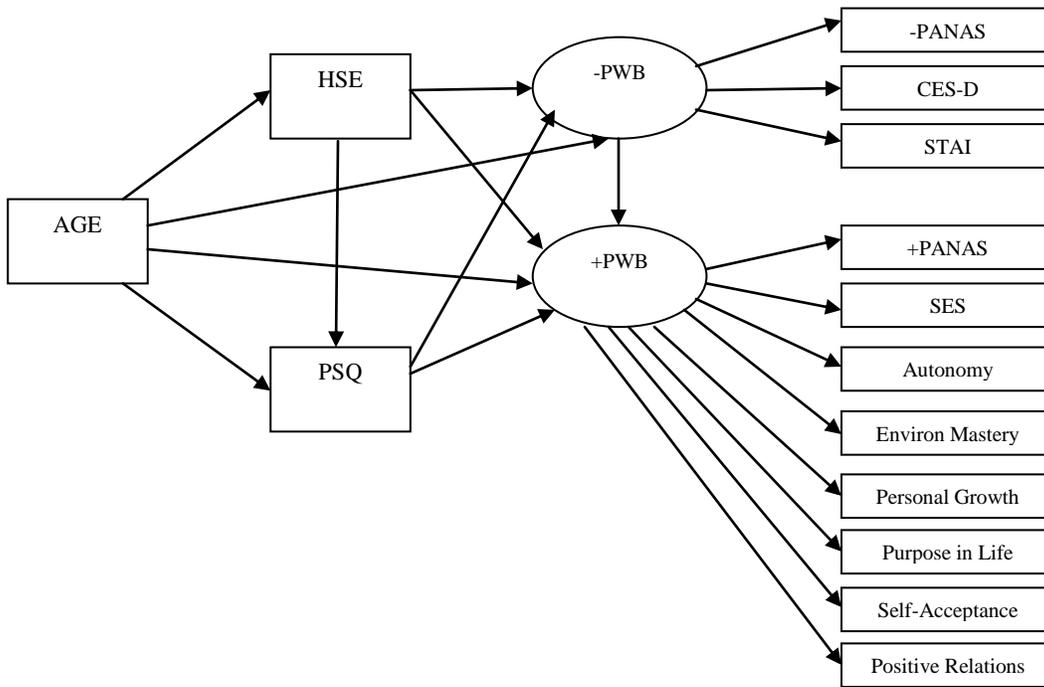


Figure 5-2. Modified latent path model for health

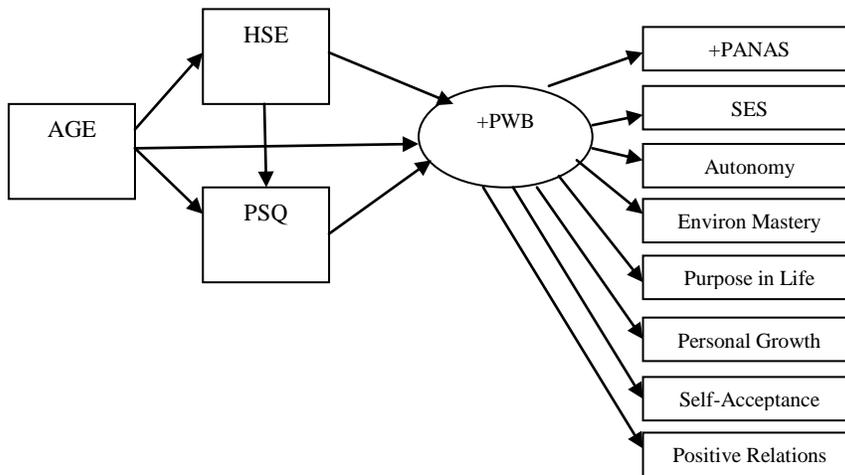


Figure 5-3. Latent path model for health hopes and positive psychological well-being

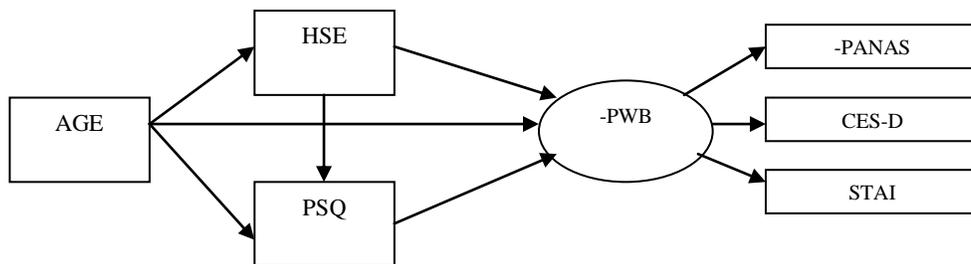


Figure 5-4. Latent path model for health fears and negative psychological well-being

CHAPTER 6 DISCUSSION

Possible selves are hopes and fears we each have about what we will be like in the future. The current study examined possible selves related to cognition and health. Specifically we selected individuals who not only reported a self related to cognition or health but also identified this self as highly important. The central premise was that positive psychological well-being should be higher (and negative psychological well-being lower) for individuals reporting high levels of perceived competence related to highly important, self-defining domains. Although possible selves have been examined extensively, this is the first study to examine the relationship between highly valued selves, feelings of competence, and psychological well-being. Believing that we have the ability to attain our most important hopes and avoid our most dreaded fears, especially when faced with declines that may threaten our ability to do so, may be central to maintaining positive psychological well-being as we age.

Possible Selves

Possible selves are elements of the self-concept that represent what a person hopes to become, would like to become, or is afraid of becoming (Markus & Nurius, 1986). Possible selves are not static goals. These selves change over time with changes in context, ability, and life stage. These future selves represent the developmental trajectory an individual envisions for him or herself. As such, possible selves can be considered a road map; although certain detours may be taken along the way, an individual finds a way to reach the important destinations. The types of selves reported by individuals in different contexts or life stages, especially age differences in possible selves, have been examined extensively. Previous research on possible selves has documented differences in the number and types of possible selves reported by different age groups. Older adults report fewer possible selves than younger adults (Cross &

Markus, 1991; Hooker, 1992) and the types of selves they report are considered more in line with their current identity. For example, older adults often report hopes and fears related to physical functioning, maintaining relationships, and continuing to engage in activities that they already enjoy participating in (Smith & Freund, 2002). In contrast, younger adults report a more diverse array of hopes and fears. For example, younger adults report hopes and fears related to their education, choosing a career path, finding a mate and starting a family (Hooker, 1992). Our results confirmed these findings. Younger adults reported a significantly greater number of hopes than older adults. Younger adults also reported a greater number of fears than middle-aged and older adults. Further, looking at the types of most important hopes and fears most frequently reported by each age group we again see that our results are consistent with previous research. For younger adults, the most frequently endorsed hope was career-related and the most frequently endorsed fear was social. For middle-aged adults, the most frequently endorsed hope was social; the most frequently endorsed fear was health-related. For older adults, the most frequently endorsed hope and fear was health-related. These differences are consistent with the experiences and expectations that accompany different stages of adulthood. Further, because middle-aged and older adults report fewer selves and the selves they report are more in line with their current identities, the ability to achieve most important hopes and avoid most dreaded fears may be key in maintaining psychological well-being throughout the later half of the lifespan as one navigates through life.

Cognition

The broad body of cognitive aging research has documented expectations of cognitive decline (Lineweaver & Hertzog, 1998; Ryan, 1992), differences in control and efficacy beliefs related to memory performance (Berry, West, & Dennehy, 1989; Lachman et al., 1995), and age-related declines in cognitive ability (Lachman et al., 1995; Ryan, 1992). Despite these findings,

very little research has been done to specifically examine whether these beliefs, expectations and experiences are represented within the possible selves of older adults. Further, what little research has been done on cognitive selves has been mixed and often depends on the definition of what a cognitive self is. For example most studies do not include a category for memory or cognition (Cross & Markus, 1991; Hooker, 1992; Hooker & Kaus, 1994) and the few that do often fail to find many participants reporting selves that fall into this category (Westerhof, Katzko, Dittmann-Kohli, & Hayslip, 2001; Smith & Freund, 2002). For the purpose of the current study, cognitive selves included hopes and fears about memory ability, as well as hopes and fears related to learning, education, and the ability or desire to engage in cognitively stimulating activities. Prior research has shown that unlike older adults, younger adults are not concerned with their memory ability; however, when examining a broader definition of cognition that included learning and cognitively challenging activities, both older and younger adults have similar numbers of cognitive hopes and fears (Dark-Freudeman, West, & Viverito, 2006). Consistent with this previous research, cognition was important to young, middle-aged and older adults in our sample. In fact, younger adults reported a significantly greater number of cognitive selves than both middle-aged and older adults. Looking at the types of cognitive selves reported by the different age groups, younger adults tended to report both hopes and fears related to learning and education. Middle-aged and older adults reported hopes related to engaging in cognitively challenging activities and learning, and fears related to mental decline. The results indicate that cognition is important among each of the three age groups albeit in different ways. A longitudinal study of possible selves would allow further exploration of these age differences. It would also allow a better understanding of the differences between individuals with and without cognitive selves and how those cognitive selves change over time.

Health

Like cognition, age differences in health status have been well documented (Ware, Snow, Kosinski, & Gandek, 1993). For example, younger adults generally report few physical limitations and high levels of physical functioning. Older adults report greater physical limitations and pain and may report being treated for chronic health concerns such as high blood pressure or arthritis. Unlike cognition, research on possible selves has focused heavily on health, specifically examining age differences in the presence or absence of health selves, as well as differences in the content of these health selves between individuals with and without chronic diseases such as Parkinson's or Alzheimer's disease (Frazier, Cotrell, & Hooker, 2003). Health selves include hopes and fears about physical functioning, general statements about maintaining health, as well as concerns about avoiding or managing specific diseases and statements about physical activity or exercise. Previous research has shown that middle-aged and older adults report a greater number of health selves than younger adults (Hooker, 1992; Hooker & Kaus, 1992; Hooker & Kaus, 1994). Further the types of health selves reported by younger adults are often very different than the types of health selves reported by middle-aged and older adults. For example younger adults may fear getting fat or may hope to lose weight (Hooker, 1992). Middle-aged and older adults tend to report health selves related to physical functioning and specific diseases (Hooker, 1992; Hooker & Kaus, 1992; Hooker & Kaus, 1994). In the current study, middle-aged and older adults reported a significantly greater number of health selves than younger adults, replicating findings by Hooker and colleagues (Hooker, 1992; Hooker & Kaus, 1992; Hooker & Kaus, 1994).

When examining the types of health selves (hopes and fears) reported by each age group, there was no significant difference between the number of health hopes reported by each age group. However, when examining health fears, a significant difference emerged as middle-aged

adults reported a significantly greater number of health fears than younger adults. This may indicate that middle-aged adults are at a crossroads, currently enjoying good health, but expecting declines in the near future. Although we did expect middle-aged adults to report a greater number of health selves compared to younger adults, we also expected older adults to report the greatest number of health selves overall. This was not the case; the number of selves the older adults reported was not significantly different from the middle-aged adults. Research on possible selves has largely neglected middle-aged adults. The current results indicate that middle-aged and older adults may report similar numbers of selves within certain domains like health.

Although middle-aged and older adults did not significantly differ in the number of health selves as hypothesized, clearly health is important for both groups. This leads us to believe that middle-aged adults are thinking about their health and their future differently than younger and older adults. Middle-aged adults may be starting to experience age-related declines in health which lead them to focus on how further declines in health may impact their future and their quality of life. Middle-aged adults may also have aging parents who are facing health challenges. These challenges may serve as a personal warning about what could be looming on the horizon. In contrast, older adults are already experiencing notable declines in physical health and functioning. Age comparisons of the SF-36 confirm this to be true. Older adults reported experiencing lower levels of physical functioning and greater physical limitations than both middle-aged and younger adults. Thus middle-aged and older adults think about health very differently than healthy younger adults do. For example younger adults may wish to live a healthy lifestyle or stay in shape, in contrast, a middle-aged adult may fear being diagnosed with diabetes and an older adult may hope to maintain the ability to walk without assistance. These

health selves are likely to be more salient to middle-aged and older adults because they have fewer hopes and fears overall and the selves they have are more closely tied to their current identity.

Psychological Well-Being

Psychological well-being is believed to be an indicator of successful development and successful aging (Markus & Herzog, 1992). In fact successful aging is often defined as maintaining psychological well-being despite losses in multiple domains such as health and social roles (Brandtstadter, 1989). Research on psychological well-being employs many different definitions and many different measures. Common measures of psychological well-being include satisfaction with life, self-esteem, and a lack of depression. Regardless of the definitions or measures used, the focus has been on what it means to function well throughout life despite the trials and tribulations we all come to face. Recently psychological well-being has been viewed as a more complex, multidimensional construct that includes distinct positive and negative dimensions (Diehl, Hastings, & Stanton, 2001; Ryff et al., 2006). Diehl, Hastings, and Stanton (2001) examined the factor structure of several common measures of psychological well-being and found a positive factor and a negative factor. The positive factor included self-esteem, autonomy, environmental mastery, purpose in life, self-acceptance, personal growth, positive relations, and positive affect. The negative factor included depression, anxiety, and negative affect. The current study also examined the same measures of psychological well-being used by Diehl, Hastings, and Stanton (2001). Confirmatory factor analyses were conducted and these latent positive and negative psychological well-being factors were supported in both cognitive and health domains. Thus positive and negative psychological well-being are not on opposite ends of the same continuum, but are distinct, though related constructs (Ryff et al., 2006).

Psychological Well-Being and Possible Selves

Possible selves represent the developmental trajectory a person envisions for themselves. As such, possible selves are used as a measuring stick to evaluate progress from current states to desired outcomes. In this respect, possible selves are believed to be related to life satisfaction and psychological well-being. For instance, individuals who feel capable of narrowing the gap between current and desired selves may have higher levels of life satisfaction and lower levels of depression, whereas individuals who do not feel capable of making progress toward desired selves may report lower levels of life satisfaction and higher levels of depression and anxiety. The current study examined the relationship between possible selves, feelings of competence related to achieving or avoiding those selves, and psychological well-being in two domains: cognition and health. Each domain will be discussed separately below.

Cognition, Competence, and Psychological Well-Being

Based on the confirmatory factor analyses for psychological well-being described above, composites were created for both positive and negative psychological well-being for our cognitive sample. No significant age differences were found for positive or negative psychological well-being composites in the cognitive sample, as expected. Older and middle-aged adults consistently report equivalent or greater levels of well-being compared to younger adults (Carstensen, et al., 2000). We also tested age differences in General Memory Efficacy and PSQ. No age differences were found for General Memory Efficacy; however, age differences were found for the PSQ. Younger adults reported feeling significantly more capable of attaining their cognitive hopes and avoiding their cognitive fears than both middle-aged and older adults, consistent with previous research on possible selves (Hooker, 1992). Although these results seem contrary, General Memory Efficacy and PSQ assess different types of

efficacy. The General Memory Efficacy questionnaire asks a participant to rate how well they have performed on recent memory activities, how their memory compares with peers, and how satisfied they are with their recent memory performance. It may be that individuals who report a most important cognitive self value cognition because they have always performed well on cognitively challenging activities. These individuals may identify themselves as intelligent and may regularly seek out cognitive stimulation. In contrast, the PSQ assesses a more specific belief -- how capable an individual feels of achieving their most important cognitive hope or avoiding their most dreaded cognitive fear. Middle-aged and older adults may be more realistic when assessing capability of achieving or avoiding a self compared to younger adults. It may also be that middle-aged and older adults have experienced some decline in cognitive ability that tempers their responses to these PSQ questions but has not yet impacted their overall efficacy beliefs on memory tasks.

In addition to examining age differences in these composite variables, we tested a model in which cognitive competence (General Memory Efficacy and PSQ) predicted psychological well-being for individuals who reported a most important cognitive self. Unfortunately the predicted relationship between competence (General Memory Efficacy and PSQ) and psychological well-being was not supported in the cognitive model. This may be due in large part to the lack of variability in psychological well-being, cognitive performance, and efficacy between younger, middle-aged, and older adults in our cognitive sample. Previous research has shown that older adults report lower levels of memory self-efficacy than younger adults (Berry, West, & Dennehy, 1989; Hultsch, Hertzog, & Dixon, 1987) and perform more poorly on memory tasks than younger adults (West, Thorn, & Bagwell, 2003; West & Yassuda, 2004). This was not the case in the current study when examining only those with cognitive selves.

Young, middle-aged, and older adults all performed very well on the word list recall activity and reported high levels of memory efficacy as mentioned above. In light of these unexpected results, we also examined age differences in BTACT word list recall performance across our entire sample. There were also no significant age differences in word list recall. These results indicate that the BTACT word list was not difficult enough as it did not discriminate well.

We also tested the cognitive model described above with cognitive performance (word list recall from the BTACT) added as a predictor of General Memory Efficacy, positive psychological well-being, and negative psychological well-being. The effect of cognitive performance on positive psychological well-being was significant; but the effect of cognitive performance on negative psychological well-being was not significant. Although General Memory Efficacy and PSQ were not significant predictors of well-being, the fact that cognitive performance was, leads us to believe that the overall conceptualization behind the model may still be valid. Individuals who identify cognition as a most important possible self and who perform better on a cognitive task report higher levels of positive psychological well-being.

Middle-aged and older adults who identify a most important cognitive self, may value cognition because they have always enjoyed and excelled at cognitively challenging activities. These individuals may be considered schematic for cognition. Self-schemas are identities that are central to an individual's current identity and are considered core representations that define who we are (Cross & Markus, 1994). When individuals have a self-schema in a particular domain they feel more control over their performance in that domain, are able to cope with negative feedback more easily, and overcome failures (Cross & Markus, 1994). Future investigations of cognitive selves should also examine attitudes about education, intelligence,

and ability to determine if there is a difference between individuals who are schematic for cognition and those who are not.

Health, Competence, and Psychological Well-Being

Based on the confirmatory factor analyses for psychological well-being described above, composites were also created for both positive and negative psychological well-being for our health sample. No significant age differences were found for the positive psychological well-being composite in the health sample; however a significant difference emerged for negative well-being. This difference was a result of younger adults reporting significantly greater levels of negative psychological well-being than both middle-aged and older adults. These differences were confirmed in follow-up analyses. Younger adults in our health sample reported experiencing greater levels of depression and negative affect, as well as less autonomy and less environmental mastery than both middle-aged and older adults. Although not entirely inconsistent with prior research, we did not expect age differences in either positive or negative well-being. It may be that younger adults who report most important health selves have health concerns, whether about specific illnesses or about physical appearance, and these concerns may impact their mental health. We also know that higher levels of depression are associated with higher reports of sickness and fatigue (American Psychiatric Association, 1994). Perhaps younger adults who are experiencing greater levels of negative well-being are also experiencing more sickness and fatigue, which in turn, leads to concerns about physical health that are reflected in their possible selves. This is an interesting idea that should be explored in future research.

We also tested age differences in Health Self Efficacy and PSQ. No significant differences were found for the Health Self-Efficacy composite measure. Adults of all ages

reported high levels of Health Self-Efficacy overall. In contrast, significant differences were found for the PSQ, as younger adults reported feeling significantly more capable of attaining their health hopes and avoiding their health fears than both middle-aged and older adults, consistent with previous research on possible selves (Hooker, 1992). Although these measures both assessed efficacy, like the cognitive measures, they assessed different types of efficacy. The Health Self Efficacy measure assessed how capable individuals felt of engaging in a variety of positive health behaviors such as eating healthy food, exercising regularly, and seeking regular preventative medical care. The PSQ assessed the degree to which an individual felt capable of achieving a most important health hope or avoiding a most dreaded health fear. It is possible that a person could report high levels of Health Self-Efficacy and at the same time not feel capable of avoiding a most important health fear such as losing mobility.

To examine the relationship between health competence (Health Self Efficacy and PSQ) and psychological well-being for individuals reporting most important health selves, we tested a model in which health competence predicted both positive and negative psychological well-being. The effects of Health Self Efficacy on both positive and negative psychological well-being were significant. Higher levels of Health Self Efficacy were associated with higher levels of positive psychological well-being and lower levels of negative well-being as predicted. Although the effects of Health Self Efficacy were significant, the effects of PSQ on positive and negative psychological well-being were not significant. Again these measures assess different types of efficacy. Further, the PSQ was also quite brief and this may have limited its predictive power. Future studies should develop a more comprehensive measure of efficacy that is directly related to the accomplishment of most important selves to determine if this type of self-specific efficacy is related to psychological well-being. Overall, these results support the central

hypothesis of the current study and suggest that competence is a predictor of psychological well-being in the health domain. A longitudinal study that examines fluctuations in competence over time within highly valued domains would help us to further understand the relationship between competence and psychological well-being.

Competence, Psychological Well-Being and Age

Although competence was high for all three age groups, we also examined the relationship between competence and psychological well-being by age group. This relationship was stronger for middle-aged and older adults than for younger adults as hypothesized. This was true for both cognition and for health. We believe this relationship is stronger for middle-aged and older adults because they generally report fewer possible selves than younger adults and the selves they report are generally grounded in their current identity. Because of this, their psychological well-being is more dependent on feelings of competence and success in fewer domains. Further, domains like cognition and health may be more salient for middle-aged and older adults because they are threatened by the anticipation of declines in cognitive and physical ability. Younger adults have a broader repertoire of selves to choose from and are not concerned with declines in health or cognitive function. Thus, the psychological well-being of younger adults is still related to feelings of competence but not to the same degree that it is for older adults. A longitudinal study could examine when and if this changes for younger adults as they move through life and begin to experience changes in health and cognition.

Hopes and Fears

Possible selves include the hopes an individual is striving to achieve as well as the fears an individual is trying to avoid. There is some controversy in the literature about whether hopes, fears, or a combination of both types of possible selves are more motivating. Smith and Freund (2002) suggested that having a balance (a hope and fear) in a given domain may be optimally

motivating, however they found that people who deleted a balanced possible self in the domain of health showed less change in subjective health and life satisfaction over a four-year period. Smith and Freund (2002) also found that life satisfaction, satisfaction with aging, and subjective health declined for individuals who added a dreaded health self to their possible self repertoire over a four-year period. On the other hand, Hooker and Kaus (1994) found, contrary to expectations in health behavior literature, dreaded health selves were associated with reports of engaging in a greater number of health behaviors, indicating that some individuals may be more motivated by dread than optimism. Our previous research on cognitive selves indicated that older adults reporting hoped-for memory selves actually reported greater levels of anxiety and fear of Alzheimer's disease than older adults reporting feared memory selves. Currently we do not know the importance of framing a possible self as a hope or a fear. Does it matter if a self is presented as a hope or as a fear? Is there something qualitatively different about a hoped-for possible self and a feared possible self? Is having both a hope and a fear in the same domain a good thing or a bad thing? Although we did not have specific hypotheses regarding hopes and fears, we did test models that examined hopes and fears separately to shed some light might be shed on these questions. These models were tested for both cognition and for health and will be discussed below.

Cognitive Hopes and Fears

First we tested a model in which age and cognitive competence (General Memory Efficacy and PSQ) predicted positive well-being for individuals with most important cognitive hopes. The model examining this relationship did not fit the data well. The paths were largely non significant. These results seem to indicate that having a cognitive hope and high cognitive competence does not predict higher levels of positive well-being. Next we tested a model in

which age and competence predicted negative well-being for individuals with most important cognitive fears. In contrast to hopes, the model examining cognitive fears did fit the data well. Although this model fit well, the effects of both General Memory Efficacy and PSQ on negative psychological well-being were not significant. Cognitive competence did not predict negative well-being for individuals reporting a most important cognitive fear. However the paths from age to PSQ and from General Memory Efficacy to PSQ were significant. The results confirmed that lower levels of PSQ are associated with older age. We also saw that higher levels of General Memory Efficacy predict higher levels of PSQ. Again, we feel that these models should be tested using a more comprehensive measure of memory self-efficacy that allows for greater variability in cognitive competence before being discarded.

Health Hopes and Fears

The model examining the relationship between competence and positive psychological well-being for individuals with health hopes did not fit the data well. It appears that having a health hope and high levels of health competence do not necessarily predict positive psychological well-being. In contrast, the model examining the relationship between health competence and negative psychological well-being for individuals with health fears did fit the data well. The effect of Health Self-Efficacy on negative psychological well-being was significant for the health sample. Lower Health Self-Efficacy was associated with higher levels of negative psychological well-being. This result appears to be driven by the younger adults. When examining the individual subscales of Health Self Efficacy, younger adults reported lower levels of efficacy with regards to both nutrition and responsible health practices. Younger adults felt less capable of eating well or taking care of themselves than middle-aged and older adults. Younger adults in our health sample also reported greater levels of depression and negative

affect, and lower levels of autonomy and environmental mastery. Thus younger adults with most important health fears are less efficacious and report lower levels of positive well-being and higher levels of negative well-being compared to our middle-aged and older adults. This is true despite the fact that older adults report the lowest level of physical health overall. These results indicate that there is something different about individuals who report health fears. It may be that individuals with higher levels of negative well-being, experience greater health problems, and are more likely to be pessimistic about the future which results in fears regardless of age.

Hopes and Fears: Do They Matter?

Interestingly, the results for hopes and fears were similar across domains. Further, these results indicate that qualitative differences exist between framing a possible self as a hope or framing as possible self as a fear, although we have yet to fully understand what those differences are. It may be that the psychological impact of moving toward a desired self and moving away from an undesired self are very different. Again, previous research suggests that hopes and fears may influence motivation differently; however we did not assess motivation in the current study. Another possibility is that personality traits may impact whether an individual frames something as a hope or a fear. For example individuals scoring higher on neuroticism may be more likely to report fears rather than hopes. This difference may also be related to a person's outlook on life, for example whether a person tends to be pessimistic or optimistic about their future. Another possibility is that current levels of psychological well-being and competence influence whether a self is framed as a hope or a fear. The current study supports this notion. Future studies should work to identify specific factors that drive people to select specific hopes or fears, or to frame their personal issues as a hope rather than a fear. This aspect of possible selves research remains relatively unexplored.

Paradox of Well-Being

Our approach to understanding the relationship between our most important selves, competence, and well-being may help address issues related to the paradox of well-being in late life. The paradox of well-being acknowledges that even in light of multiple age-related declines across multiple domains like health and cognition, older and middle-aged adults consistently report equivalent or greater levels of well-being compared to younger adults (Carstensen, et al., 2000). Consistent with this, older adults in the current study reported fewer possible selves, reported experiencing greater physical problems and limitations, as well as greater pain. Yet in light of this, older adults reported higher levels of positive well-being and lower levels of negative well-being than younger adults. Because older adults report fewer possible selves than younger adults, they are most likely more invested in the selves they do report. As a result older adults may be reporting better psychological well-being in part because they also report high levels of efficacy in domains of high personal importance. Because these domains are already tied to the current identity of older adults, they serve to reinforce positive self definitions.

Brandtstadter (1989) has described coping mechanisms through which older adults maintain well-being in the face of age-related decline. When striving toward personally meaningful goals, older adults maintain feelings of competence and well-being by assimilative processes like adjusting their efforts or by accommodative processes like redefining their goals and what it means to be successful (Brandtstadter, 1989; Brandtstadter, Rothermund, & Schmitz, 1998). Research has shown that assimilation and accommodation increase in the later half of life (Brandtstadter and Baltes-Gotz, 1990; Rothermund & Brandtstadter, 2003) and that higher levels of assimilative and accommodative coping are associated with lower levels of depression and social dysfunction (Boerner, 2004). Although the current study examined how perceptions of

competence related to highly valued future hopes and fears contributed to well-being, we did not assess whether an individual had redefined competence or adjusted his or her possible self over time. Examining when and how individuals engage in assimilation and accommodation activities in the cognitive and health domains will be an exciting next step in this program of research.

Limitations

A main goal of this study was to understand the consequences of high and low levels of competence in domains of central importance to the self-concept. Unfortunately we were not able to address this issue entirely. Our sample had high levels of competence for both cognition and health. This lack of variability is a limitation. As a result we were not able to test what the model would have predicted for individuals with low levels of competence in the current study. It may be that individuals, who value cognition or health but begin to experience declines in competence, revise or drop these selves and as a result were not included in our sample. A longitudinal study would be necessary to examine this possibility.

Similarly, our younger, middle-aged, and older adults all reported high levels of memory efficacy, contrary to expectations. It may be that our measure of memory efficacy was too brief to capture the variability within our age groups. Initially this measure was designed to be a part of a composite that included measures from the Metamemory in Adulthood scale and was not intended to be used as an individual predictor. In the future, a more comprehensive measure such as the Memory Self-Efficacy Questionnaire (MSEQ) developed by West and Berry (Berry, West, & Dennehy, 1989) may be more appropriate.

The cross-sectional nature of the current study limits the conclusions we can currently draw. Although we examined younger, middle-aged, and older adults, we cannot make any statements about when cognitive or health selves begin to emerge. A longitudinal study of

possible selves, competence, and psychological well-being would allow us to understand how possible selves and feelings of competence change over time and how these changes impact psychological well-being and behavior in domains of personal importance.

Last, our method of data collection using surveys that participants completed at home, on their own, may have limited the amount of data collected on the open-ended portion of the possible selves questionnaire. Most of the previous research on possible selves has been conducted using individual or group interview sessions. This was done because the questionnaire could potentially be confusing to older adults (Hooker, 1992; Hooker & Kaus, 1992; Hooker, 1999). However, our results are consistent with those obtained from individual and group interviews, suggesting that this methodological change was not problematic. For example, on average, 86% of the older participants in these prior studies reported health-related selves. Consistent with these previous results, in the current sample, 83% of our older participants reported a health-related self. Although it is true that we may have received more detailed descriptions of possible selves in a one-on-one setting, participants in the current study reported a diverse and rich array of future selves consistent with previous research.

Conclusion

The relationship between competence and psychological well-being is complex. This has been the first study to examine the relationship between most important possible selves, domain-specific competence and psychological well-being. Although age differences in the content of possible selves have been examined extensively, the relationship between possible selves, competence and psychological well-being has been taken for granted. The current study found that competence does predict psychological well-being in the health domain. With a more sensitive measure, we believe that competence will predict psychological well-being in the cognitive domain as well. Testing models within different domains of personal importance such

as possible selves and competence related to careers and social relationships would add further support to the overall model. Further, the relationship between competence and psychological well-being appears to be different for hopes and fears. The combination of fears within self-defined important domains, low competence in those domains, and negative well-being may be important in identifying individuals who may need psychological intervention. The goal of future investigations will be to uncover the importance and utility of possible selves by understanding the relationship between our most important hopes and fears, our feelings of competence related to achieving or avoiding them, our psychological well-being and ultimately our behavior.

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BIOGRAPHICAL SKETCH

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