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What Contributes to Well-Being in Later Life? How Two Life-Span Perspectives Explain the Process

Yeojin Rho
Claremont Graduate University

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Claremont Graduate University

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APPROVAL OF THE DISSERTATION COMMITTEE

This dissertation has been duly read, reviewed, and critiqued by the Committee listed below, which hereby approves the manuscript of Yeojin Rho as fulfilling the scope and quality requirements for meriting the degree of Doctor of Philosophy.

Jeanne Nakamura, Chair
Claremont Graduate University
Associate Professor

Mihaly Csikszentmihalyi
Claremont Graduate University
Distinguished Professor

Kendall Cotton Bronk
Claremont Graduate University
Associate Professor

Suzanna Penningroth
Washington State University
Associate Professor

Abstract

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Goals influence the direction of life. Because of this, goals play major roles in our motivations, behaviors, perceptions, thoughts, and feelings (Cavanaugh & Blanchard-Fields, 2015). Thus, it has been one of the important topics in developmental psychology to study how goals are formed and changed over the life-span. Selection, optimization, and compensation (SOC) theory and socioemotional selectivity theory (SST) explain goal changes throughout life. Although these theories focus on different factors that led to goal changes and on different aspects of goals, both theories assert that people can achieve their goals, be satisfied with their life, and finally experience successful aging (Freund & Baltes, 1988, 2002a; Fung, Rice, & Carstensen, 2005; Kennedy, Fung, & Carstensen, 2001; Lang et al., 2002). Guided by SOC theory and SST, this study examined individual differences in older adults' goal achieving strategies and goal types using survey questionnaires. Although SOC and SST can explain general age changes in goal strategies and goal types, resources are important factors to explain individual differences in goal strategies and goal types. The study examined how goal strategies and goal types mediate the relations between individual differences, specifically health, educational level, and neuropsychological system in personality, and older adults' life satisfaction. The participants were adults 65 and older recruited from Adult Day Care Health Centers in the Los Angeles area.

Mediation effects were not found. However, there were significant moderation effects of different goal achievement strategies and goal types on relationships between individual factors and life satisfaction. That is, higher life satisfaction during older adulthood was associated with using different goal achievement strategies and focusing on different goal types depending on people's levels of individual resources. Socioemotional selectivity theory and selection, optimization, and compensation theory may better illuminate the relationship of goal pursuit to satisfaction with later life when individual factors are taken into account. Limitations and future directions are discussed.

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Introduction

The elderly population is rapidly increasing worldwide, especially in industrialized nations (Howden & Meyer, 2011). According to the Administration on Aging (2011), there are 40 million adults over the age of 65 in the United States. For this reason, research on older adults is dramatically increasing (Vaillant, 2004). Although the number of studies about cognitive, social, and personality changes with age were increasing during the past 20 years, the number of studies about psychological aging was relatively small compared to studies about biological and physical aging (Zacks, Blanchard-Fields, & Haley, 2006). In addition, some studies just focused on the negative aspects of aging and considered the aging process as a social problem (Bond & Coleman, 1990). For example, they focused on the negative quality of public attitudes to old age and aging and related aging to loss of abilities and skills and to withdrawal from work and society (Knight, 1999; Levy, 2003). These studies asserted that our psychological abilities decline and some mental problems increase as we become older (Hybels & Blazer, 2003). According to Levy (2003), because people generally had negative stereotypes about aging, people anticipated their retirement and aging negatively.

Although aging and older adults have been viewed from a negative perspective and people increased risk of losing resources with age, recent research has consistently found that many adults reported higher levels of life satisfaction with age although they experienced age-related declines in their abilities, resources, and so on (Gana et al., 2013; Jeste et al., 2013). Based on these results, it could be concluded that older adults could achieve life satisfaction and could enjoy their lives in spite of experiencing age-related declines at the same time. It is

important to understand this paradox. It is possible to explain this paradox using two goal-related theories, Selection, Optimization, and Compensation theory and Socioemotional Selectivity theory. The present study employed these two perspectives and examine not only subjectively perceived, age-related goal changes but also relationships between goal changes and life satisfaction.

Compared to other social science disciplines, Western psychology has a long history of asserting that individuals can create and build their lives according to their own choices and can adjust to the environment around them based on their goals (Poulin, Hasse, & Heckhausen, 2005). One of the examples of these traditions is an entity theory of self and incremental theory of the world (Heine, 2012). According to an entity theory of self and incremental theory of the world, individuals from an individualistic culture choose their goals considering their own interests and motivations rather than fitting their goals to the environment around them; they believe that they can modify the environment around them based on their goals that are partially endorsed by the culture and society. In addition, action theory explain that individuals initiate behaviors based on their goals (Freund & Ebner, 2005). That is, goals play major roles in our development and our lives because they influence our life's direction (Cavanaugh & Blanchard-Fields, 2015).

According to Emmons (1996), goals are "desired states that people seek to obtain, maintain, or avoid" (p.314). Individuals choose goals from their various options and tries to achieve them. When their goals are achieved, individuals also try to maintain their status. If they find they cannot achieve the goals that are derived from their interests and values, they may give these goals up and try to find alternative ones. In this process, the concept of agency, the ability of individuals to make their own choices and act independently, are very important (Lerner,

2002). Even in the situations when they have to give up unattainable goals, the sense of agency are important in their lives and development. Having a sense of agency, individuals can feel they select disengagement from the previous goal and choose an alternative one rather than feeling forced to give up the goal and have the alternative one.

Goals and sense of agency were strongly related to an individual's life satisfaction (Lang & Heckhausen, 2001). There are two possible explanations for this positive relationship. First, individuals' goals usually provide meaning and direction in their lives (Brandtstädter & Rothermund, 2002). Due to this, people can have higher levels of life satisfaction if they have goals. Second, people can be satisfied with their life if they can achieve their goals successfully and perform everyday tasks without large difficulties. When people have a sense of agency, they believe that they can successfully obtain their goals and perform their everyday tasks (Lang & Heckhausen, 2001). Because of this belief, people can more eagerly focus on their goals, try harder to achieve them, and have more success achieving them. Brandtstädter and Rothermund (2002) also asserted that people can experience dissatisfaction with their life when they cannot obtain their goals. According to them, it is very important to disengage from unattainable goals and to select alternative ones that can be achieved, in order to maintain life satisfaction.

From the life-span perspective, studying goals is helpful to understand lifelong development. Goal orientations -- growth, maintenance, and loss prevention orientations -- change across the different stages of life (Fung et al., 2005). Researchers found that people have different goal orientations based on changes in their challenges, opportunities, and life experiences as they go through the different developmental periods (Heckhausen & Schulz, 1993). There are two perspectives that explain these age-related goal changes (Fung et al., 2005). First, researchers have emphasized the role of losses that are encountered in the aging process

(Fung et al., 2005). According to this perspective, people disengage from their original goals and find alternative ones when they find that they cannot achieve their original goals due to age-related loss of resources. That is, people change their goals based on their resources, environments and contexts. This type of strategy is called reactive adaptation. This reactive adaptation is described in the theory of selection, optimization, and compensation strategies (SOC) because people start to change or modify their goals after they experience age-related loss of resources. Second, other researchers found that a reason for stage-related differences in goals is future time perspective (Freund & Ebner, 2005). According to Carstensen (1992), people's active choice of their goals is important. Not only do people change their goals based on losses of resources but also they actively choose their goals based on their developmental period and awareness of their future time horizon. This type of strategy is called proactive choice (Fung et al., 2005). An example of this perspective is socioemotional selectivity theory, which is discussed later. Although these two perspectives agree that goals of each individual change during the developmental process, they assert different reasons, reactive or proactive, for age-related changes in goals. Because changes in goals and strategies with age are important to deal with age-related declines and to achieve a satisfying life for older adults, it is important to examine various aspects of these theories, Selection, Optimization, and Compensation (SOC) and Socioemotional Selectivity Theory (SST), and to understand the relationship between these aspects and life satisfaction of older people**.**

Although it is already known that people change their goals or their goals achievement strategies during their developmental process from these two perspectives, we do not know whether there are any individual differences based on each individual's resources level and how these individual differences are related to life satisfaction during older adulthood. To understand

more fully about these changes in goals and goal achievement starategies and relationships with life satisfaction during older adulthood, it is necessary to study individual differences in this topic. In academical perspectives, this study can add important meanings of individual differences on goal changes and goal achievement strategies. In practical perspectives, this study can help older adults can have higher life satisfaction although they experience declines in resources or has limited resources by providing appropriate programs.

Chapter I. Background and Literature Review

Selection, Optimization, and Compensation Theory (SOC)

Developmental changes in goal orientations. In Baltes and colleagues' life-span developmental perspective (Ebner, Freund, & Baltes, 2006), there are two important characteristics that represent development during adulthood. According to these researchers (Ebner et al., 2006), individuals can experience both gains and losses throughout their whole life. In contrast to other developmental perspectives which asserted that people can experience gains only during childhood and adolescence, life-span developmental theory claimed that there are both gains and losses throughout the whole lifelong developmental process. In addition, Baltes (1997) concluded that there is a shift from a positive balance to a less positive balance between gains and losses during the life-span. This shift is caused by limited resources and declining abilities in physical and cognitive functions that have occurred during the aging process (Baltes, 1997).

Because the gain/loss ratio changes across the life-span, people change their goal orientations to maintain a balance between gains and losses (Ebner et al., 2006). Three types of goal orientations were proposed as means to achieve this end: growth orientation, maintenance orientation, and loss-prevention orientation (Freund & Baltes, 2002a). When people do not face serious loss that causes limited resources or they have enough resources that help deal with loss that is not serious, they focus on a *growth orientation*. When people have this goal orientation, they try to achieve their original goals and desired outcomes. Examples of a growth orientation include resilience and optimistic appraisals about the situation. When people recognize that they have limited resources and reduced abilities that interrupt achieving their original goals, they may have a *loss-prevention orientation*. Compared to a growth orientation, people try to avoid

negative and undesirable outcomes when they focus on a loss prevention orientation. In a *maintenance orientation*, people focus on keeping their current abilities and functional levels. Usually, people start to use a maintenance orientation when they start to recognize that they have a few limitations and declines but they do not think these limitations and declines cannot be fixed (Freund & Baltes, 2002a). Other researchers (Freund & Ebner, 2005) distinguished two types of goal orientations rather than three: approach goal orientation and avoidance orientation. An approach goal orientation corresponds to a growth orientation; an avoidance goal orientation includes both maintenance and loss-prevention orientations.

The question of how these goal orientations change according to developmental periods and gain/loss-ratio changes has been emphasized by studies conducted from a life-span developmental perspective. Although age and developmental stages are crucial factors in influencing goal orientation changes, it has to be kept in mind that other factors such as disability and poverty also have an important influence on goal selection (Salmela-Aro, 2009).

Developmental researchers have assumed that younger adults usually focus on a growth goal orientation because they have not yet experienced serious resource limitations or declining functions and have opportunities that can bring skill improvement and new skill acquisition. Older adults usually report maintenance and loss-prevention goal orientations because they have already faced a serious degree of resource limitations and declining abilities that hinder gains. That is, they emphasize an avoidance goal orientation to maintain their current functional level and to avoid losses (Ebner et al., 2006). Most studies that examined developmental changes in goal orientations from an approach/avoidance perspective showed a consistent result that usually younger adults emphasize the approach goal orientation and older adults emphasize the avoidance goal orientation although only a few studies have addressed this research question

(Freund & Ebner, 2005). Heckhausen (1997) found that young adults listed more approach goals than middle-aged and older adults. In contrast, compared to young and middle-aged adults, the goal orientation of older adults was more related to prevention of loss. Ogilvie, Rose, and Heppen (2001) found a slightly different result studying goal orientation in adolescents, middle-aged adults, and older adults. All three age groups reported more growth goal orientation than the other two types of goal orientation. However, this research showed that older adults focused on maintenance goal orientations more than adolescents and middle-aged adults did. According to Ebner et al, (2006), younger adults primarily focused on a growth goal orientation. Although middle-aged and older adults also primarily focused on a growth goal orientation, in addition they emphasized goal orientations that are related to maintenance and prevention of loss. These results supported the assumption that goal orientations change from a growth goal to maintenance and loss-prevention goals according to place in the life-span. In this study (Ebner et al., 2006), the available amount of resources for achieving goals was manipulated. The participants regardless of age primarily adopted maintenance and loss-prevention goal orientations rather than a growth goal orientation when there were not enough resources for obtaining goals. That is, this result supported the claim that developmental changes in goal orientation are strongly related to the amount of resources each individual can use. Through the aging process, the amount of resources and the ability to use resources efficiently usually decline. It can be concluded that developmental changes in goal orientations toward an avoidance goal orientation are caused by limited resources and declining abilities rather than by age *per se.* Based on these previous research, it is reasonable to think that people change their goals through their life and these changes in goals are based their resources level.

As mentioned before, personal goals are strongly related to life satisfaction (Rapkin &

Fischer, 1992). For this reason, it is important to study how the relationships between goal orientation and life satisfaction changed with age. Only a few studies dealt with this question. Most of these studies have addressed these relationships among younger adults rather than among individuals at different ages (Ebner et al., 2006). A number of studies found that there were positive relationships between approach goal orientation and life satisfaction in young adults whereas young adults who primarily had avoidance goal orientations reported lower levels of life satisfaction and negative emotional status (Coates, Janoff-Bulman, & Alpert, 1996; Emmons, 1996).

In contrast to the research described above, Ebner et al., (2006) studied age-related differences in relationships between goal orientation and subjective well-being. They found two main age differences in this relationship after controlling for cognitive and physical performance. First, when young adults emphasized a loss prevention goal orientation, they showed lower levels of subjective well-being but there was no negative relationship between a loss prevention goal orientation and well-being in middle-aged and older adults. That is, there is a possibility that a loss prevention goal orientation has a negative effect only on young adults. This may mean that a loss prevention goal orientation is not appropriate and not beneficial for young adults' development because they have enough resources for gain and growth. Second, when older adults focused on a maintenance goal orientation, they reported higher levels of subjective well-being. This age-related difference can be explained by the Conservation of Resources (COR) model. According to COR (Hobfoll, 1989), it is natural to experience imbalance between gains and losses in resources throughout the life-span. But resource loss has a stronger effect on each individual's well-being than resource gain. According to Hobfoll (1989), individuals feel serious stress and depression when they experience resource losses. For older adults, it is essential to

maintain current resources and functioning to preserve subjective well-being because resource losses have started to outnumber resource gains. A maintenance goal orientation works as a protective factor of older adults' well-being in resource loss situations. Due to this, when older adults focus on maintenance goals, they can receive benefit from this goal orientation. For them, a maintenance goal orientation is one way to adjust to their changed situations and to achieve successful development (Ebner et al, 2006). As mentioned, there was no negative relationship between a loss prevention orientation and subjective well-being in older adults. Using these results, it is possible to explain the paradox of aging partially. Although older adults cannot maintain the same level of resources and functioning that younger adults have, they can keep their subjective well-being level as they focus on maintenance and loss-prevention orientations.

Developmental changes in strategies for achieving goals. Baltes and Baltes (1990) proposed Selection, Optimization, and Compensation (SOC), to describe strategies related to successful development and successful aging. They explained successful development and aging as a result of developmental changes in strategies for achieving goals (Freund, 2008). Successful development and aging occur with the benefit of developmental changes in SOC strategies. This model was based on three assumptions (Freund, Li, & Baltes, 1999). First, individuals may create their own development and adjust their development according to the environment around them. That is, people can build their own developmental path by choosing their goals according to their interests and motivations. In addition, they correct and change their goals based on demands and limitations from their physical, psychological, socio-cultural, and historical contexts. Second, every individual experiences resource limitations across the life-span. According to Baltes (1997), these limitations of resources are related to two factors. With age, people have reduced resources for goal achievement. These limitations apply to both internal and

external resources. In addition, the ability to use available resources efficiently decreases with age. Third, throughout life, each individual experiences both gains and losses. In the life-span perspective, people can experience both gains and losses at any developmental moment.

According to the SOC model, people can achieve successful development and aging using selection, optimization, and compensation strategies appropriately based on available resources and demands from contexts (Freund, 2008; Freund et al., 1999). It is important to know definitions and methods related to each SOC strategy before examining age-related changes in these strategies. While the selection strategy is based on the goal itself and goal settings, optimization and compensation strategies are based on means for achieving goals. First, selection is based on the principles that every individual has limited resources and cannot achieve all kinds of goals. Through the selection strategy, not only can people select their own goals but also they can to some extent choose their own developmental path and direction in their lives. There are two types of selection strategies: elective selection and loss-based selection. Using elective selection, people select their goals according to their interests and motivations, create a goal hierarchy, and commit to these selected goals in order to achieve their goals. People can focus on elective selection when they do not face serious losses that have a negative effect on achieving their goals (Ouwehand, de Ridder, & Bensing, 2007). Compared to elective selection, loss-based selection is used when losses begin to outnumber gains. When people recognize that it is not possible to achieve their original goals because of serious losses, people start to use the loss-based selection strategy. The examples of loss-based selection are giving up current goals, focusing on more important goals, reconstructing the goal hierarchy, and finding new alternative goals (Freund et al., 1999). In contrast to selection strategies, the optimization strategy is used when people want to make sure that they use their ability to obtain goals. Optimization consists

of acquiring new skills and/or resources, practice, and increasing effort to achieve goals. Optimization succeeds only in the absence of serious loss in ability and resources (Ouwehand et al., 2007). Finally, the compensation strategy is emphasized when people start to experience loss of resources and declining abilities. In this strategy, people focus on avoiding a loss situation rather than achieving gains or maintaining past gains or current resources. Instead, individuals find alternative means for achieving goals, use external aids, and search for unused resources and skills (Freund et al., 1999).

When people experience a loss, they may focus on compensation and/or loss-based selection strategies. However, although they face a loss of resources, it is possible to achieve their original goals if they use various types of compensation strategy. That is, people using compensation strategies may not need to disengage from and give up their original goals. In contrast, people may disengage from and give up their original goals in loss-based selection (Ouwehand et al., 2007). When the levels of loss are serious, it may not be possible to stick to the original goals even if people try harder and use all available resources (Ouwehand et al., 2007).

According to Baltes and Baltes (1990), it is very important to use these strategies appropriately based on available resources and functions for successful development and aging. Baltes and Baltes (1990) asserted that there are age-related changes in using these SOC strategies. There were two findings that show age-related changes in using SOC strategies (Freund & Baltes, 2002b). First, with age, the usage of SOC strategies increases (Baltes & Baltes, 1990). As people become old, they can accumulate various experiences and knowledge to help understand their preferences and SOC strategies. Freund and Baltes (2002b) found that young and older adults prefer proverbs that are related to SOC strategies (e.g., “Practice makes

perfect") to other proverbs that are not related to SOC strategies (e.g., "Time will tell") when these proverbs represent their long-term goals. In addition, there are positive relationships between age and elective selection strategy of life management (Freund & Baltes, 2002b). That is, compared to young adults, middle-aged and older adults more emphasize the elective selection strategy when they consider their goals (Freund, 2008).

In addition, older adults focus on the elective strategy more than middle-aged adults. Although young adults have to select their goals and developmental paths in work, relationships, and so on, they have more room to try many options and opportunities in order to find their real interests and preferences (Erikson, 1968; Freund & Baltes, 2002b). That is, despite the elective selection strategy being needed by young adults, normatively more explorations are also needed for their successful development. For this, young adults have enough time to explore many options before they decide on their goals. Compared to young adults, middle-aged adults and older adults are in different situations. When individuals reach middle-age, their developmental goals are normatively related to achieving higher levels of functions in their own work and family more than exploration of diverse options (Erikson, 1968). Because of these developmental goals and requirements, they may not have enough time and energy to explore a variety of options. In addition, people accumulate knowledge and understand that they cannot pursue every goal and life path and have to choose goals and focus on these goals (Freund & Baltes, 2002b). Especially because older adults usually face declining resources and abilities to use these resources efficiently, elective selection plays a more important role to achieve goals among older adults before they experience serious losses of resources. When older adults start to experience severe resource limitations, they have to focus on loss-based selection. It can be concluded that usage of SOC strategies, especially elective selection, increases with age (Freund, 2008).

Second, according to Baltes and Baltes (1990), the SOC strategies are strongly related to the amount of available resources. That is, people start to emphasize SOC strategies when they face a loss of resources and declining functional levels in order to achieve their goals efficiently. However, these SOC strategies are always based on available resources (Freund & Baltes, 2002a). Each SOC strategy needs some levels of resources and functionalities in physical, cognitive, psychological, and other aspects. Because of this, the usage of SOC strategies declines when an individual faces severe resource limitations. Freund and Baltes (1998) found this age-related decline in usage of SOC strategies in older adults (age from 72 to 102) in the Berlin Aging Study. There were significant negative relationships between age and all four SOC related behaviors in this study. This result showed that when people reach very old age, usually they do not have enough resources and abilities in physical, cognitive, and other domains to undertake SOC strategies. Freund and Baltes (2002a) examined how the usage of SOC strategies changes during adulthood using young, middle-aged, and old-aged participants. They found middle-aged adults use SOC strategies more than other age groups except for elective selection. That is, there were significant positive relationships between age and optimization, compensation, and loss-based selection strategy from young adulthood to middle-age. But there were negative relationships between age and the three SOC strategies from middle-aged adult to older adult. These results showed that although people start to emphasize SOC strategies when they experience limited resources and declining abilities to use resources efficiently, resources are needed to use SOC strategies.

Based on these two sets of results, it can be concluded that people usually focus more on SOC strategies to achieve their goals as they age and start to experience limited resources and declining abilities. However, when facing severe resource limitations in very old age, it is not

easy to use SOC strategies for achieving goals. For this reason, it is important to examine relationships between SOC strategies and developmental processes throughout the life-span, especially during later adulthood.

Although resource level is important for the use of SOC strategies, only a few studies have examined how resources of older adults influence individuals' SOC strategies (Bourgeois, 2001). In addition, these studies just focused on physical health as resources although each individual has different resources, abilities, characteristics, and so on. Due to this, it seems likely that people have different strategies to achieve their goals based on their physical, cognitive, and personality resources. There are general age-related declines in physical functional level during the aging process. But people differ in the level of these declines in physical functions. People have different educational levels by the time they reach late adulthood. And this education can work as a buffer during aging. In addition, there are individual differences in personality. The personality system, specifically the behavioral inhibition system (BIS) and behavioral activation system (BAS), is directly related to goal achievement. For this reason, this study will examine how each individual's health, educational level, and behavioral inhibition system (BIS) and behavioral activation system (BAS), are related to their SOC strategies. According to Bourgeois (2001), older adults who have poorer physical health resources focused on more loss-based selection, more compensation, and less optimization. However, older adults who had richer physical health resources used more optimization. This finding agreed with previous research (Freund et al., 1999; Ouwehand et al., 2007). When people start to experience losses in their resources and abilities, they start to focus more on loss-based selection and compensation. That is, they have to change their original goals and find alternative goals, or find external means to help achieve their original goals. However, they cannot use the optimization strategy because

they do not have enough resources to learn new skills and to practice them.

There appears to be no study that has examined how educational level is related to the use of SOC strategy, although there is evidence that older adults can maintain their active life style and receive benefit (e.g., lower levels of dementia) if they have enough cognitive resources and have new learning experiences (Bourgeois, 2001). We can assume that people who have higher educational levels are more motivated to learn new things and have more cognitive resources and abilities than people with lower levels of education. That is, it is possible to hypothesize that people will use different types of SOC strategies based on their educational levels. Maybe older adults who have higher educational levels will focus more on optimization while other older adults who have lower educational levels will use more compensation or loss-based selection especially concerning goals that need cognitive resources and abilities. Because there is no research that has examined these possibilities and resource levels are related to usage of SOC strategies, it is important to study individual differences in SOC strategies based on educational level.

Turning to personality system, Gray (1970) proposed two systems, behavioral inhibition system (BIS) and behavioral activation system (BAS), which influence our activities based on a biopsychological theory of personality. These two personality systems are directly related to the motivations that regulate our goal achievement behaviors. Due to it, it was necessary to study how these two pernality systems are related to SOC strategies. According to Berkman, Lieberman, and Gable (2009), BIS is activated when people recognize cues or situations that cause negative and/or bored feelings. People with a highly active BIS have avoidance motivations when they face situations which led to negative feelings. Based on this explanation by Gray (1970), it can be assumed that older adults with a highly active BIS will use more

compensation or loss-based selection when they start to experience losses in their resources and abilities because they have higher levels of sensitivity to unfavorable situations and try to avoid these situations.

In contrast to BIS, BAS is related to approach goals rather than avoidance goals (Gray, 1970). That is, BAS is directly related to sensitivity to situations that lead to nonpunishment, rewards, and control. People who have higher levels of BAS try to pursue and achieve their goals in order to control their environments. Based on this explanation by Gray (1970), it can be hypothesized that older adults with a highly active BAS will use more optimization when they start to experience declining abilities and losses in their resources. If they achieve their goals, they can experience positive feelings.

There has been no study to test how BIS (behavioral inhibition system) and BAS (behavioral activation system) are related to SOC strategies although there are some studies that have examined the relationship between other personality types – so-called Big 5 personality traits – and SOC strategies (Wiese, Freund, & Baltes, 2000). Because these two personality systems are directly related to goal achievement motivation yet there is lack of knowledge about the relationships between SOC strategies and BIS and BAS, investigation of these relationships is needed.

Some studies have examined how SOC strategies affect well-being (Freund & Baltes, 1988, 2002a; Lang et al., 2002). The Berlin Aging Study (Freund & Baltes, 1998) showed that there are significant positive relationships between usage of SOC strategies, elective selection, loss-based selection, compensation, and optimization and satisfaction with age and positive emotions. In addition, there was a significant negative relationship between the usage of SOC strategies and feelings of loneliness. The participants, aged from 18 to 89, who reported using

more SOC strategies showed higher levels of subjective well-being, positive emotions, autonomy, environmental mastery, personal growth, positive relationships, purpose in life, and self-acceptance (Freund & Baltes, 2002a). These positive relationships were still significant after the researchers controlled for other personality and motivational factors. In addition, Freund and Baltes (2002a) found although compensation and loss-based selection strategies influence subjective well-being positively in later life, optimization influences subjective well-being most strongly. Lang, Rieckmann, and Baltes (2002) conducted a 4-year longitudinal study of older adults aged from 70 to 103, to compare survivors with non-survivors in terms of SOC strategies in leisure activities. According to this study, survivors used more of the selection strategy to choose their leisure activities, and more optimization when spending more time and energy in their selected leisure activities compared to non-survivors. That is, people who used more SOC strategies had healthier lives than people who used fewer SOC strategies. These two studies showed that there are positive relationships between SOC strategies and subjective well-being and physical health; thus, it could be concluded that SOC strategies may significantly influence well-being or vice versa depending on health, educational level, and personality.

Socioemotional Selectivity Theory (SST)

From the life-span perspectives, people select not only different goal achievement strategies but also goal types with age and experiencing changes in their resources. Due to it, it is needed to study the relaionships among individual differences, health, education level, and personality system, goal types, and life satisfaction to understand goal changes and well-being during older adulthood more fully.

According to socioemotional selectivity theory (Carstensen, 1992, 1995), time perception is an important factor for selecting and changing social goals (Carstensen, Isaacowitz,

& Charles, 1999). The ability to perceive time is one of the unique characteristics of human beings (Suddendorf & Corballis, 1997). When people perceive their future time, usually they organize their developmental process in terms of events in their own experience, including such events as loss of physical and cognitive functions, death of a loved one, graduation, marriage, retirement, and so on, as reference points. Using these types of special events, some individuals recognize that their future time is limited (Kennedy et al., 2001). Socioemotional selectivity theory asserted that people select their social goals, and even their social partners, based on this time perception (Carstensen, 1992, 1995).

Carstensen (1992) focused on social goals based on social relationships rather than on other types of goals, because social relationships with others are strongly related to life satisfaction, successful aging, and successful developmental processes. There are two types of social goals in socioemotional selectivity theory: the acquisition of knowledge (instrumental) and the regulation of emotion (emotional satisfaction). These two goals can be considered social goals because they change the preferred type of relationships with others. In short, when people have the acquisition of knowledge goal, they focus on the instrumental roles of relationships (Kooij & Van De Voorde, 2011). However, when they have the regulation of emotion goal, they give priority to the emotional satisfaction aspect of relationships with others. People select their social partners and build or maintain their social networks based on their social goals. The goal of acquisition of knowledge helps to understand oneself, others, and the world. If people have the goal of acquisition of knowledge, they try to find a role model, to get advice from others, and to get information from the relationships. Through others, people want to get knowledge about themselves, others, and the world. For this reason, people would like to meet new people to get new information and to expand their social networks to find role models and to receive advice

from social networks. Although these new social networks may cause negative emotions and these types of relations may be relatively superficial, people try to build new and extended social networks in order to achieve more long-term goals (Fung & Carstensen, 2004). This type of goal is future-oriented (Carstensen et al., 1999). For these reasons, when people perceive their time as limitless and open-ended, they focus on the goal of acquisition of knowledge (Carstensen, 1992, 1995). For them, long-term goals are more important and adaptive because they perceive open-ended lifetimes.

Compared to the goal of acquisition of knowledge, when people have an emotion related goal the intention is to regulate their emotions, to have positive emotions, and to find meaning in life from relationships with others. This type of goal is present-oriented rather than future-oriented; people focus more on current emotional status than achieving long-term goals, because they perceive that their future time is not open-ended (Carstensen et al., 1999). Therefore, people do not build new social networks that have a possibility to bring uncertainty or negative emotions. Rather, they focus on existing relationships, especially close relationships. In addition, they keep their social networks smaller by discarding peripheral relationships (Burnett-Wolle & Godbey, 2007). Because usually people know how to behave with others in close relationships, it is easier to regulate their emotions with older rather than with newer acquaintances.

Although SST focuses on the importance of time perception in social goal choices, this theory is relevant to life-span developmental psychology because the perception of time is strongly related to age. According to SST (Charles & Carstensen, 2009), this awareness of time influences our goal priorities, as both a conscious process and an unconscious process. Lang and Carstensen (2002) found that there is a strong relationship between age and time perception by studying adult participants aged from 20 to 90. The older adults usually perceive that their future

time is limited, and younger adults report that their remaining time is open-ended. For this reason, it is reasonable to research social-goal differences with age.

Socioemotional selectivity theory asserts that each person's life stage affects the social goals that he or she emphasizes (Carstensen et al., 1999). During infancy and early childhood, emotion-related goals are emphasized more because our cognitive functions have not yet fully developed to understand concepts related to time. From middle childhood to early adulthood, the importance of emotion-related goals decreases. Rather, people start to emphasize the goal of acquisition of knowledge during this life stage. People have to find their own interests and abilities and explore others and the world in order to choose their own long-term partner and job during this time period. That is, achieving long-term goals becomes more important than pursuing immediate emotional satisfaction in this stage. However, after people start to perceive their future time as finite, the importance of the emotion regulation goal again increases from middle to later adulthood. Older adults may have already achieved some parts of their long-term goals. In addition, current and immediate emotional satisfaction is more important than long-term goals because they perceive that they do not have enough time to pursue long-term goals. Thus, the present moment is more important for them (Carstensen et al., 1999).

In addition, other studies (Carstensen & Turk Charles, 1994; Fredrickson & Carstensen, 1990) on social cognition and cognitive processing showed age-related differences in choosing social goals (Kennedy et al., 2001). Fredrickson and Carstensen (1990) found that older adults focus more on emotional aspects of social worlds when they choose their relationships than adolescents, young adults, and the middle-aged. While older adults focus more on the emotional rewards that their social partners and networks can provide, young adults consider three aspects of social partners and networks equally: emotional rewards, getting information, and possibilities

of future contacts. This result showed that older adults have limited time perceptions and then they adopt emotion related goals and use this type of goal when they select their social networks.

These age-related differences in social goals were also found in a cognitive processing study. Carstensen and Turk-Charles (1994) let participants aged from 20 to 83 read a few parts of a famous novel and perform a recall test. While older adults could recall well information that was related to emotions, young adults usually could recall well information that did not include any emotional facts. It can be concluded that older adults both consciously and unconsciously concentrate on emotional information because they perceive their future time as not open-ended and have more present-oriented goals. Based on multiple studies, we can conclude that older adults perceive their future time as limited; because of this, they start to focus on their current emotional status, find meaning in their life, and value the present moment.

Although age is a significant predictor for time perception, it is important to consider other factors that can influence future time perspective (Kooji & Van De Voorde, 2011). One of these factors is subjective general health. According to Carstensen et al., (1999), the time perception of patients who have HIV symptoms was very similar to the time perception of older adults, although these patients were all in young adulthood. That is, they usually focused on the present-oriented goal, emotion regulation, rather than the future-oriented goal, acquisition of knowledge. In addition, researchers (Bal et al., 2010; Lang, 2000; Lang & Carstensen, 2002) consistently found that there were significant relationships between future time perspective and subjective general health. That is, if people reported higher levels of general health, they usually had an open-ended time perspective. Therefore, it is necessary to study how the health status of a person influences the relationship between age and social goals.

No study has found a significant relationship between educational level and social goals.

A few studies used educational level as a control variable to evaluate the relationship between age and social goals (Fung, Carstensen, & Lang, 2001). These studies found that age was a significant predictor of changes in social goals after controlling for educational level. Although there was not a significant relationship between educational level and social goals in this sample of 20 to 80 year olds, it might be important to test further for effects of educational level on changes in social goals in order to understand the full picture of the aging process. It can be hypothesized that people who have higher educational level are more motivated to acquire new knowledge, and try harder to fulfill these motivations, than people who are less educated. Usually, more educated older adults participate in more active types of leisure activities, retire later, and so on (Minhat & Amin, 2012). It can be hypothesized that older adults who have higher educational levels will focus on both social goals together, or focus more on acquisition of knowledge, while less educated older adults will focus more on emotion regulation. Because there is no research that examines these hypotheses, to study the relationship between educational level and social goals is important.

In addition, it is important to measure the relationship between SST and personality system because there were individual differences in motivations. According to Gray (1970), people with a highly active BIS tried to avoid situations that caused them bored or negative feelings while people with a highly active BAS tried to achieve their previous goals in spite of experiencing negative feelings. These explanations were related to SST. According to Carstensen (1992), older adults switched their goals from knowledge acquisition goals to emotion regulation goals for experiencing positive feelings instead of dealing with negative feelings. Due to these reasons, it is needed to study these two personlality system. Although there seems to be no study of how personality system affects social goals, it can be hypothesized that older adults who have

higher levels of BIS will more have emotion regulation goals (Bipp, Steinmayr, & Spinath, 2008). Because people who are sensitive to unfavorable situations try to avoid these situations, they will more focus on emotion regulation. In contrast to BIS, it can be hypothesized that older adults with a highly active BAS will focus more on the acquisition of knowledge goal because their personality is based on approach goals (Bipp et al., 2008). Because people have different resources, abilities, and characters, people have different life goals, life paths, adaptation styles, and so on. In order to understand how older adults select their social goals more thoroughly, one needs to focus not only on universal developmental patterns but also on individual differences.

The relationships between time perception and social goals influence each individual's life satisfaction. Although there are some studies that focused on SST in various aspects, there are only a few studies that found how changes in social goals according to time perception affect life satisfaction. Lang and Carstensen (2002) studied the relationships between life satisfaction and changes in goals according to time perception in participants aged from 20 to 90 years. This study showed significant relationships between each type of social goal and life satisfaction. They found a positive relationship between emotion related goals and life satisfaction and a negative relationship between emotion related goals and social strain, but only when adults perceive their time as limited. However, those who focused on knowledge related goals reported lower levels of satisfaction with social relationships, and higher levels of social strain. Therefore it can be concluded that adults who focus on emotion related goals are more satisfied with their lives when they perceive their future time as limited.

Because older adults focus more on emotional aspects of their life, it is possible to conclude that older adults can regulate their emotions better than young adults (Kennedy et al., 2001). According to Gross and Levenson (1997), there are two general ways people regulate

their emotions: antecedent-focused and response-focused. Antecedent-focused emotion regulation refers to avoiding situations that can cause negative emotions. In contrast, response-focused emotion regulation refers to evaluating situations that bring negative emotions, after experiencing the negative emotions. According to SST, using these two emotion regulation strategies leads to more positive emotions and less negative emotions (Burnett-Wolle & Godbey, 2007).

Gross and colleagues (1997) found that older adults showed better ability to regulate emotions than younger adults. According to this study, older adults also reported lower levels of negative emotions than young adults. Other researchers (Kennedy et al., 2001) found no difference in the experience of positive or negative emotions between young and older adults. However, there is a significant difference in the duration of negative emotions between older and young adults. Both older and young adults report that they experience negative emotions to the same degree but durations of negative emotions in older adults are much shorter than in young adults. That is, because older adults focus more on the goal of emotion regulation, it is possible that they can control their negative emotions well. Socioemotional selectivity theory used this result to explain the paradox of aging (Kennedy et al., 2001). The paradox of aging refers to the fact that older adults maintain or improve their life satisfaction levels compared to previous life stages although older adults usually experience losses of resources, abilities, family, and social networks. These are strongly related to negative emotions. But older people can be satisfied with their life in spite of these losses because they can control their negative emotions by concentrating on emotion regulation goals, although this process needs investment of time and a lot of energy (Kennedy et al., 2001; Muraven & Baumeister, 2000). Overall, it can be concluded that people select their social goals (between knowledge related goals and emotion regulation

goals) according to perceptions of time. Because older adults perceive their time as not open-ended, they focus on emotion regulation goals and then achieve higher levels of life satisfaction. Although future time perception is important for selecting social goals, it is needed to study how personal resources, health, education, and personality influence to select social goals because each individual has different resources and different motivations.

Selection, Optimization, and Compensation (SOC) and Socioemotional Selectivity Theory (SST)

Although both SOC strategy theory and SST analyze how people change and select their goals according to each individual's developmental stage, these two theories have different perspectives and scopes about goal changes. First, each theory proposes different causes that lead to goal changes with age. Selection, optimization, and compensation strategy theory asserts that experiencing resource losses and declining abilities causes changes in goals based on growth, maintenance, and prevention of losses. Due to this, the investment of available resources for growth decreases while the investment of available resources for maintenance and prevention of losses increases with age. For this theory, experience of resource losses is an important factor leading to goal changes. As a result, this has been called a theory of reactive adaptation (Fung et al., 2005). Compared to SOC theory, socioemotional selectivity theory has different perspectives about goal changes. In SST, time perception plays an important role in selecting and changing goals. If people start to have a limited future time perception, they tend to change their goals from knowledge related goals to emotion related goals. Because the goal changes are not based on changes from environments and contexts or experience of resource losses and declining abilities but on each individual's cognitive evaluation of their future time, SST is considered a theory of proactive choice (Fung et al., 2005). According to SST, people do not consider limited

future time as an experience of loss of their resources and abilities (Fung et al., 2005). Because of this, Fung et al., (2005) asserted that people may not feel negative emotions strongly although they experience limited future time perception. In addition, they believed that older adults can regulate their negative emotions as they focus on emotion regulation goals. Although SST does not assert the goal changes stem primarily from the experience of losses, it also assumes that the experience of losses can cause goal changes (Kooji & Van De Voorde, 2011). That is, it can be concluded that people start to consider goal changes because they start to experience that their resources are not enough to achieve their goals. Based on these explanations, it can be assumed that people will focus more on SOC strategies when they start to experience limitations and declining abilities. And then people will start to focus on emotion regulation goals in order to protect their available resources and not to waste their resources. Here, it has to be kept in mind that although SOC is considered a theory of reactive adaptation and SST is considered a theory of proactive choice, in contrast to SST, SOC theory claims that time can be considered as a diminishing resource. People experience running out of the essential resource of time when they get older no matter how smart, healthy, or rich they are.

Second, SOC strategy theory deals with a variety of goals (Penningroth & Scott, 2012). SOC strategy theory does not limit the range to specific types of goals. The changes in various goals of an individual may be explained by SOC strategy theory. Compared to SOC strategy theory, SST primarily focuses on social goals.

Using these two theories, we can explain how individuals adjust and change their goals as they grow old. Figures 1 and 2 illustrate goal changes in SOC and in SST. In addition, older adults can be satisfied with their life using SOC strategies and goal changes according to time perception even when they face losses in resources and abilities. For this reason, we do not need

to separate these two theories, or to choose between them. Penningroth and Scott (2012) showed that older adults use both SOC strategies and emotion regulation goals as they age rather than focus on only one adaptive strategy. That is, older adults can achieve their goals, adjust to changing environments, regulate their negative emotions, and be satisfied with their life through these two methods when they change and adjust their goals.

Overall, people can select and change their goals according to environmental changes and their judgment based on their cognitive assessment about time perception. That is, people can select their goals reactively and proactively. These two strategies can help people achieve their goals and be satisfied with their lives.

For these reasons, understanding how older adults select goal achievement strategies and social goals is important. In addition, individual differences in selecting goal strategies and goal types, such as differences in health, educational level, and personality, should be studied in terms of SOC theory and SST. Individuals have different levels of resources, abilities, and future time perceptions. Health, educational level, and personality are examples of these individual differences. Especially because health and educational level are directly related to social aging policy, these factors should receive further study. Based on the characteristics of community or environment, it can be easy to meet people who have different health and educational levels. For example, in adult education programs, it may be easy to find older adults who are healthy and have higher levels of education. It is more effective to adjust social policy to help older adults' aging process according to their community or environment. In addition, there are significant individual differences in personality and these individual differences influence people's perception, cognition, interpretation, and so on. Due to this, it is worthwhile to study how individuals select goal achievement strategies and social goal types based on SOC and SST

according to individual differences in health, educational level, and personality. This study assumes that there are individual differences in people's goal achievement strategies and goal types although SOC theory and SST propose general changes with age. Given the importance of adaptive goal processes to successful aging, it is worthwhile to more fully understand the relationship of well-being to goals during older adulthood by studying how older adults select goal pursuit strategies and goal types depending on individual differences.

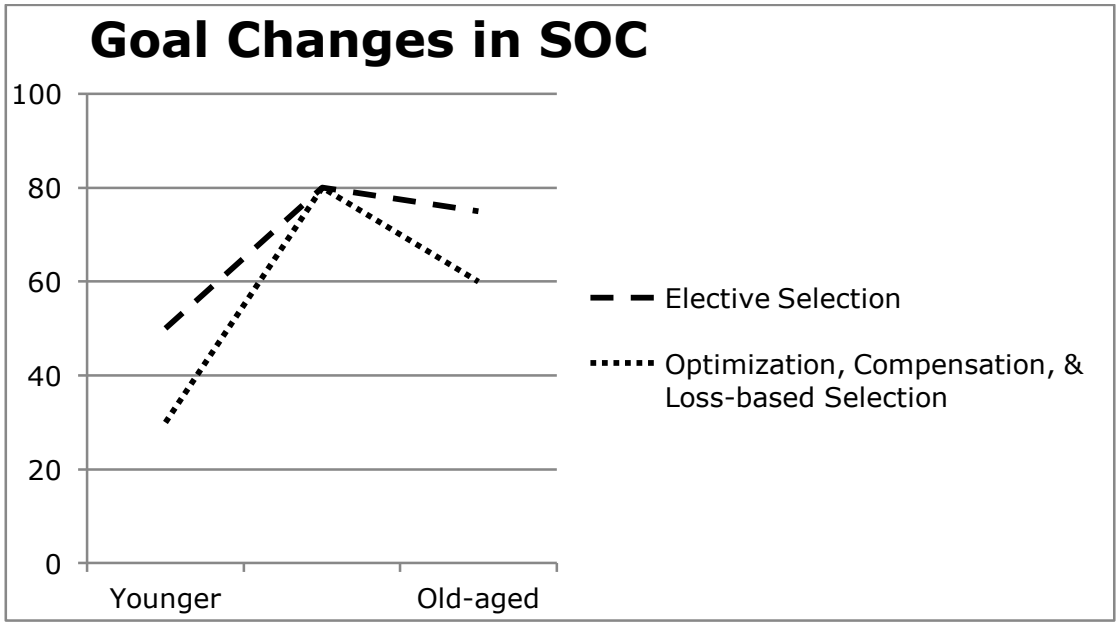


Figure 1. Goal Changes in SOC

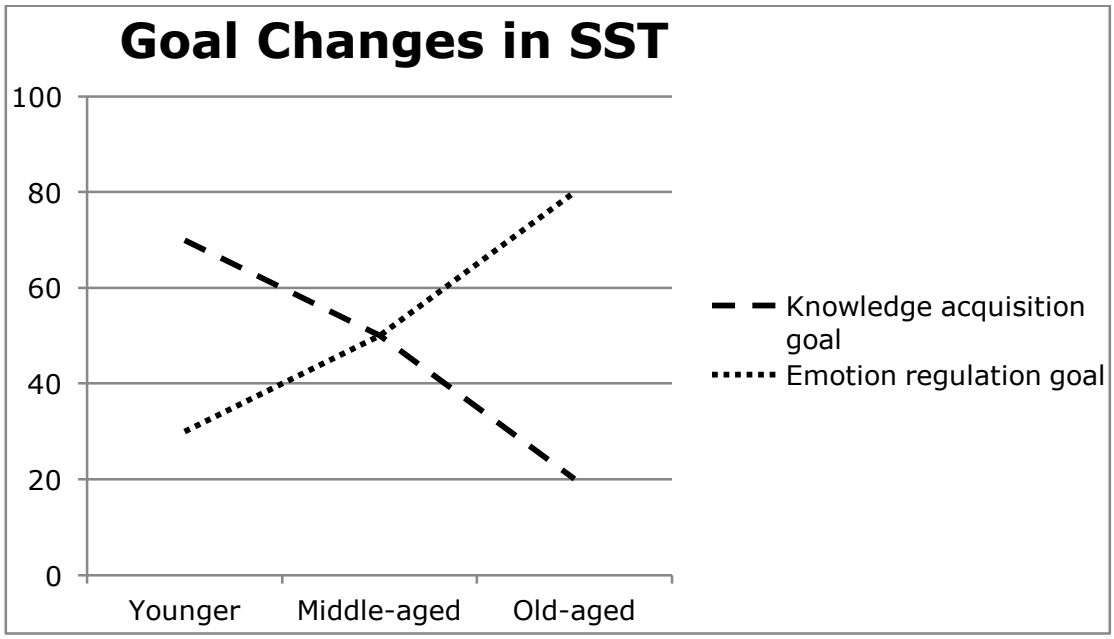


Figure 2. Goal Changes in SST

Chapter II. Hypotheses

The following hypotheses based on theory and previous research would be addressed in this study.

Hypothesis 1. Selection, Optimization, and Compensation (SOC)

Consistent with Freund, Lin, and Baltes (1999) and Ouwehand et al., (2007), it was hypothesized that older adults who are in good health will use more optimization strategies and this will predict higher life satisfaction after controlling for age, marital status, and religious activity (Hypothesis 1a, Figure 3). It was also hypothesized that those who are in poor health will use more loss-based selection and compensation strategies and this will predict higher life satisfaction after controlling for age, marital status, and religious activity (Hypothesis 1b, Figure 3). A few studies (Freund et al., 1999; Ouwehand et al., 2007) examined these relationships between health status and SOC strategies treating health as a control variable.

It was hypothesized that older adults who have higher levels of education will use more optimization strategies and this will predict higher life satisfaction after controlling for age, marital status, and religious activity (Hypothesis 1c, Figure 4). In addition, it was hypothesized that those who have lower levels of education will use more loss-based selection and compensation strategies and this will predict higher life satisfaction after controlling for age, marital status, and religious activity (Hypothesis 1d, Figure 4). These hypotheses have not been tested in previous studies.

It was hypothesized that older adults who have higher BAS (behavioral activation system)-activation will use more optimization strategies and this will predict higher life satisfaction after controlling for age, marital status, and religious activity (Hypothesis 1e, Figure 5). It was hypothesized that those who have higher BIS (behavioral inhibition system)-activation

will use more loss-based selection and compensation strategies and this will predict higher life satisfaction after controlling for age, marital status, and religious activity (Hypothesis 1f, Figure 5). These hypotheses have not been tested in previous studies.

Hypothesis 2. Socioemotional Selectivity Theory (SST)

Consistent with Lang (2000), Lang and Carstensen (2002), and Bal et al. (2010), it was hypothesized that older adults who are in good health will focus more on knowledge acquisition goals than emotion regulation goals and this will predict higher life satisfaction after controlling for age, marital status, and religious activity (Hypothesis 2a, Figure 6). Those who are in poor health will focus more on emotion regulation goals and this will predict higher life satisfaction after controlling for age, marital status, and religious activity (Hypothesis 2b, Figure 6).

It was hypothesized that older adults who have higher levels of education will focus more on knowledge acquisition goals and this will predict higher life satisfaction after controlling for age, marital status, and religious activity (Hypothesis 2c, Figure 7). Those who have lower levels of education will focus more on emotion regulation goals and this will predict higher life satisfaction after controlling for age, marital status, and religious activity (Hypothesis 2d, Figure 7). These hypotheses have not been tested in previous studies.

It is hypothesized that older adults who have higher BAS-activation will focus more on knowledge acquisition goals and this will predict higher life satisfaction after controlling for age, marital status, and religious activity (Hypothesis 2e, Figure 8). Older adults who have higher BIS-activation will focus more on emotion regulation goals and this will predict higher life satisfaction after controlling for age, marital status, and religious activity (Hypothesis 2f, Figure 8). These two hypotheses have not been examined in previous studies.

Chapter III. Methods

Participants

Only older adults whose native language was English were studied, to reduce misunderstanding caused by language barriers or difficulties. In this study, older adults meant people who were older than 65 years old. The mean age of participants was 81.27 years old (*SD* = 7.36) and the range was from 66 to 97 years old. This study analyzed 208 cases after questionnaires that were incomplete were excluded. There were no restrictions on participation based on health status or educational level because this study addressed how different goal pursuit strategies and different goal types mediated the relationships between individual factors and life satisfaction. However, this study had the exclusion criteria that individuals who could not read survey questionnaires due to vision impairment and/or illiteracy were excluded.

Participants who reported having a job were not included in this study. Only older adults who were already retired or who never had a job, were included to control the effect of job satisfaction on the life satisfaction during older adulthood. There were 75 (36.1%) males and 133 (63.9%) females in this study. There were 54.8 % of Caucasians, 21.2% of Black/African America, 3.8% of Asians, and 20.2% of Hispanic. The mean of subjective health was 3.59 (*SD*=1.38) and this meant average subjective health status in this study was between good and very good. The mean of Instrumental Activities of Daily Living (ADL) was 2.92 (*SD*=1.07) and the mean of health status was 3.83 (*SD*=1.11). Whereas 9.1% of participants reported that their subjective health was poor, 36.1% of participants reported that their subjective health was excellent. In the study, 13.5% of participatns had less than high school degree or some high school education, 34.6% of participants had high school diplomas, 6.7% of participants had associates degrees or some college education, 27.9% of participants had bachelor's degrees, and

17.3% of participants had master's or doctoral degrees.

Procedure

The data were collected through Adult Day Health Care centers in the Los Angeles area including in Los Angeles, San Bernardino, and Riverside. In the U.S, older adults who do not experience severe disabilities and can live independently in some degree can attend the Adult Day Health Care centers. The researcher explained the purpose and process of this research to staff members at each center and asked them to explain the research to older adults and to encourage the older adults to participate in the research. Participation was voluntary and a tea bag was offered to all participants as a token compensation. There was no penalty or loss of benefit for choosing not to participate. After participants got information about the process and the purpose of the study, they received the consent form and checked the box to agree to participate. Questionnaires were collected from participants in sealed envelopes by staff members at each center to protect privacy and to maintain confidentiality. In addition, there was nothing that indicated participants' identity, to maintain confidentiality. Questionnaires were created and distributed as a pencil and paper form. It took around 20-30 minutes to complete the questionnaire. These all processes to collect data followed the consent procedures by IRB.

Materials

Background information. In this study, age, race, gender, marital status, health status, educational level, religious activity, and years since retirement were asked on the questionnaire. The health status was measured with 7 items. Participants responded about their subjective health using one item (In general, would you say your health is, from 1 = "*Excellent*" to 5 = "*Poor*"), seven items measuring Activities of Daily Living (ADL, Brim, Ryff, & Kessler, 2004; e.g., Does your health now limit you in these activities? If so, how much? Walking several blocks, from 1 =

"*A lot*" to 4 = "*Not at all*"), and three items from the Health Questionnaire (Health Outcomes Institution, 1993; e.g., How much bodily pain have you had during the past 4 weeks?, from 1 = "*None*" to 6 = "*Very severe*"). The general subjective health rating items and rating items in the Health Questionnaire were reverse-coded. The reliability coefficient of ADL was .98 and the reliability coefficient of Health Questionnaire was .93 in this study. Higher scores in subjective health, ADL, and Health Questionnaire indicated that participants had better physical health. Scores for subjective health, ADL, and Health Questionnaire were summed and a composite score was used in this study. The subjective health question was presented as Appendix E in the background information questionnaire and ADL and Health Questionnaire were presented as Appendix F. In addition, educational level was measured with one item. Participants answered the question, "What is your highest education?" selecting from eight different categories (from 1="*Less than high school*" to 8="*Doctoral or professional degree*"). Marital status was dummy coded (0=Single, divorced, & widowed, 1=Married). Religious activity was measured with one item. Participants answered the question, "How often do you spend time in religious activities, such as pray, meditation, Bible study, or attend church, temple, or mosque?" (from 1="*Rarely or never*" to 5="*Daily or more often*").

Selection, optimization, and compensation (SOC). The SOC questionnaire developed by Baltes, Baltes, Freund, and Lang (1999) was used in this study. This version of the measure included four subscales: elective selection, loss-based selection, optimization, and compensation. Each subscale had 12 items (e.g., Elective selection: "I concentrate all my energy on few things"; Loss-based selection: "When things don't go as well as before, I choose one or two important goals"; Optimization: "I keep working on what I have planned until I succeed"; Compensation: "When things aren't going so well, I accept help from others"). In this study, a 5-point Likert-

type scale (from 1 = "*Not at all like me*" to 5 = "*Very much like me*" with mid-point 3 = "*Somewhat like me*") was used rather than forced-choice format to test the degree of usage of elective selection, loss-based selection, optimization, and compensation more precisely (Baltes et al., 1999). The reliability coefficient of optimization was .90 in this study. The reliability coefficient of loss-baseed selection was .90 and the coefficient of compensation was .89. Answers were summed and the score range on each subscale would be from 12 to 60. A higher score on each subscale represented higher usage of elective selection, loss-based selection, optimization, and compensation. The 48 items were presented as Appendix A.

Socioemotional selectivity theory (SST). The Revised Change in Activity and Interest Index (CAII-R) revised by Adams and Sanders (2010) was used in this study because Carstensen and her colleagues had not created a scale to measure the change in activity and interest predicted by SST. The CAII was developed based on Socioemotional Selectivity and gerotranscendence theories (Adams, 2004). The gerotranscendence theory was developed by Tronstam (1997). According to this theory, people become to have wisdom and maturity according to change in the perception of time with developmental process. In addition, these wisdom and maturity are positive related to life satisfaction. This measure included 30 items that compared participant's level of investment in activities 10 years ago with the present. These 30 items were organized by Carp (1968) based on the categories of disengagement: family or children, material things, mental stimulation/ideas, participation in activities, and people other than kin. According to results from principal component analysis (Adams, 2004), this measure was composed of 5 categories of items: Active instrumental items, Social intellectual items, Spiritual concern items, Transcendence items, and unassigned items. Based on Adams' factor analysis, two sub-scales relevant to SST, Emotion regulation goals (9 items, e.g., "I enjoy

visiting with old friends or longtime neighbors") and Knowledge acquisition goals (10 items, e.g., "I make plans for the future"), were used. The instructions were the following: "Thinking of yourself nowadays and comparing yourself to how you usually were 10 years ago, please answer each of the questions below" (e.g., "I enjoy visiting with old friends or longtime neighbors") using a 5-point Likert scale (from "*much less*" to "*much more*"). The reliability coefficient of emotion regulation goal was .92 and the reliability coefficient of knowledge acquisition goal was .96. The scores had positive and negative values. Positive scores indicated maintained or increased activity or interest and negative scores indicated decreased in activity or interest. The 19 items were presented as Appendix B.

Life satisfaction. The Satisfaction with Life Scale (SWLS) was used in this study. The widely-used scale was developed by Diener, Emmons, Larsen, and Griffin (1985). This scale consists of five items (e.g., "I am satisfied with my life") rated on a 7-point Likert scale (from 1 = "*Strongly disagree*" to 7 = "*Strongly agree*"). The reliability coefficient was .96 in this study. Answers were averaged across the items. A higher score indicated higher life satisfaction. This scale was presented as Appendix C.

Behavioral inhibition system/behavioral activation system (BIS/BAS). The BIS/BAS scale developed by Carver and White (1994) was used in this study. This scale was used in many studies (Franken, Muris, & Georgieva, 2006; Mardaga & Hansenne, 2006; Voigt, Dillard, Braddock, Anderson, Sopory, & Stephenson, 2009). It consisted of 24 items rated on a 4-point Likert scale (from 1 = "*Very false for me*" to 4 = "*Very true for me*"). Four items measured BAS drive (e.g., "I go out of my way to get things I want"), 4 items measured BAS fun seeking (e.g., "I'm always willing to try something new if I think it will be fun"), and 5 items measured BAS reward responsiveness (e.g., "When I'm doing well at something I love to keep at it"). Of the

other 11 items, 7 measured BIS (e.g., “Criticism or scolding hurts me quite a bit") and 4 were used as fillers. The reliability coefficient of BAS drive, fun seeking, and reward responsiveness was .78, .78, and .71 respectively. The reliability coefficient of BIS was .90. Answers in each subscale were summed. The score range in BAS was from 13 to 52 and in BIS was from 7 to 28. A composite BAS score indicated that respondents had higher levels of BAS drive, BAS fun seeking, and BAS reward responsiveness. Higher BIS scores indicated that respondents had higher levels of BIS. This scale was presented as Appendix D.

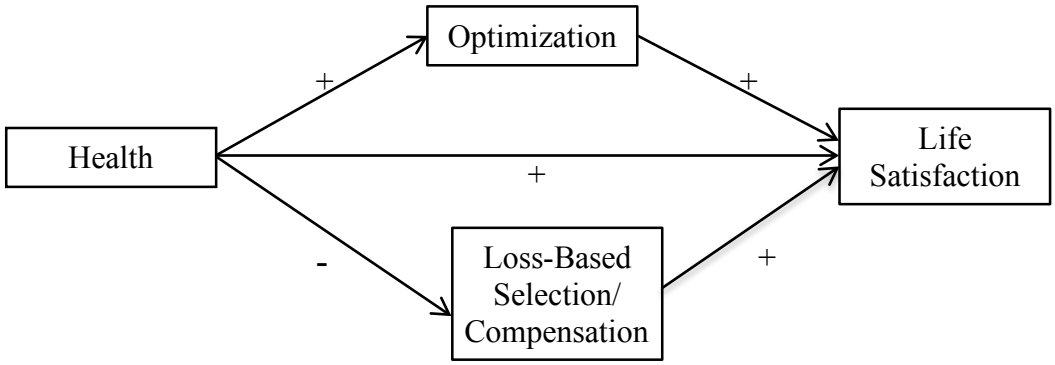


Figure 3. Relationship between Health and Life Satisfaction Mediated by SOC (Hypotheses 1a & 1b)

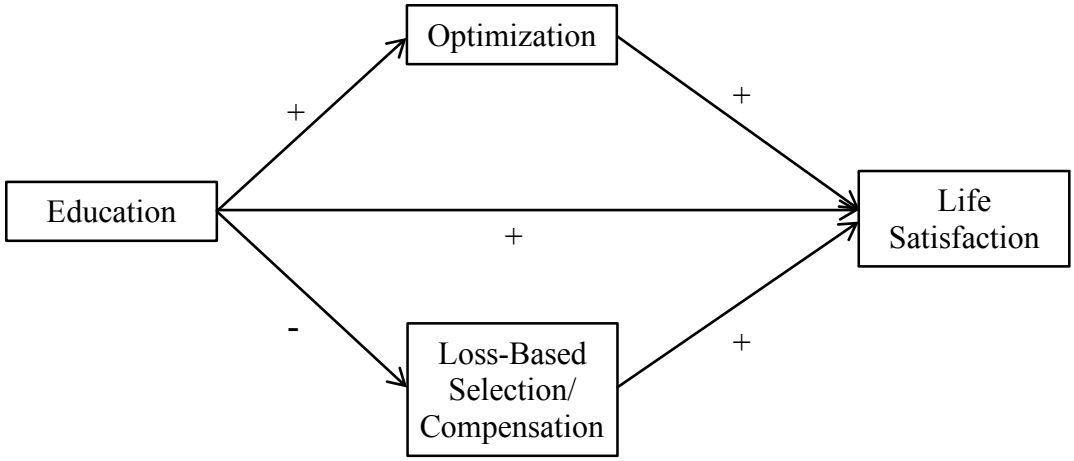


Figure 4. Relationship between Education Level and Life Satisfaction Mediated by SOC (Hypotheses 1c & 1d)

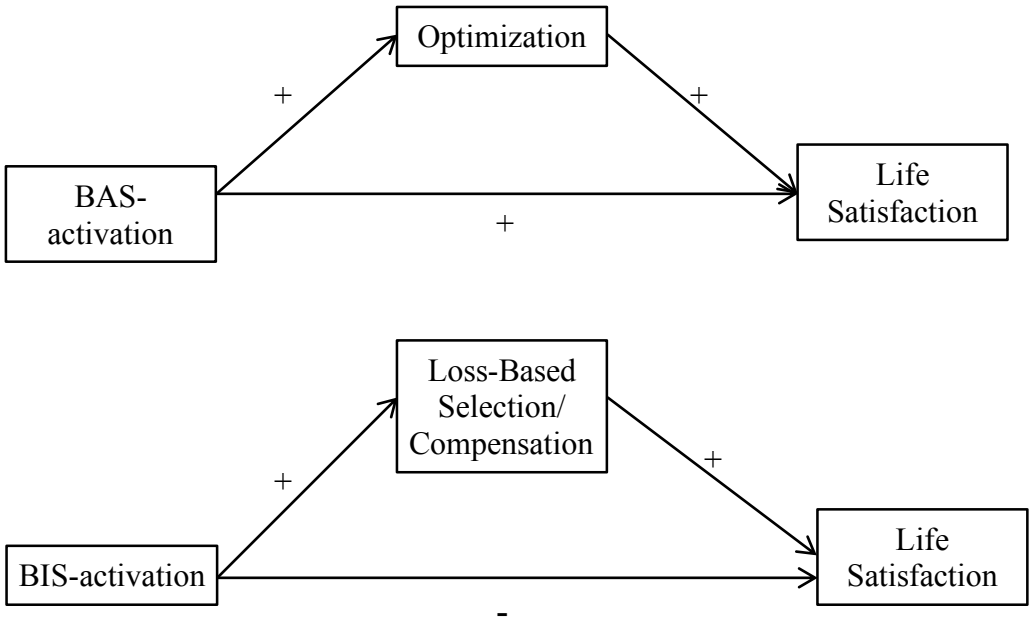


Figure 5. Relationship between Personality (BIS, BAS) and Life Satisfaction Mediated by SOC (Hypotheses 1e & 1f)

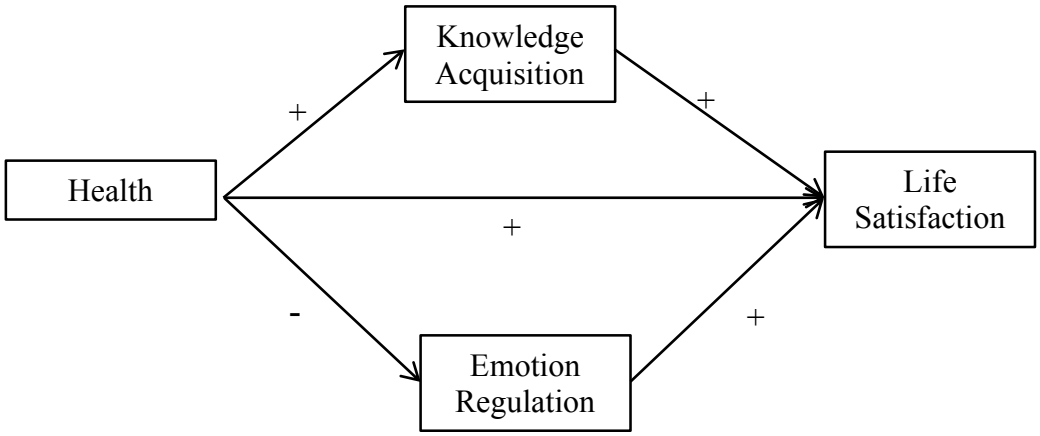


Figure 6. Relationship between Health and Life Satisfaction Mediated by SST (Hypotheses 2a & 2b)

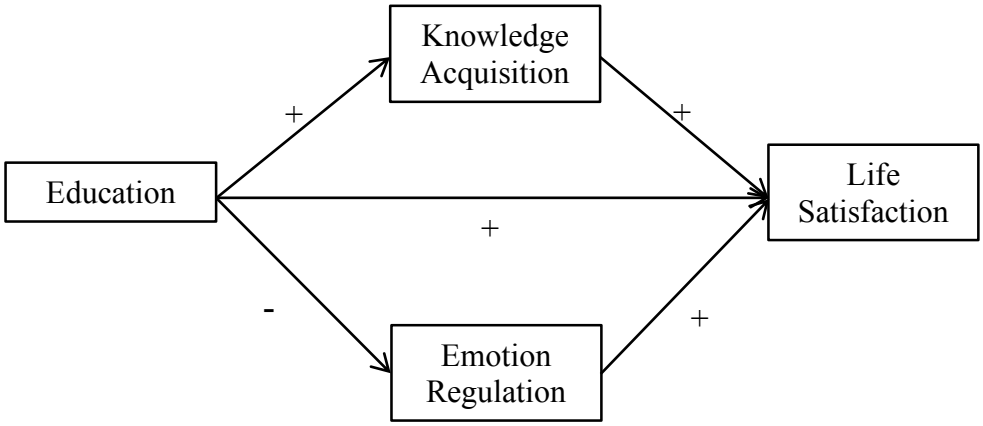


Figure 7. Relationship between Educational Level and Life Satisfaction Mediated by SST (Hypotheses 2c & 2d)

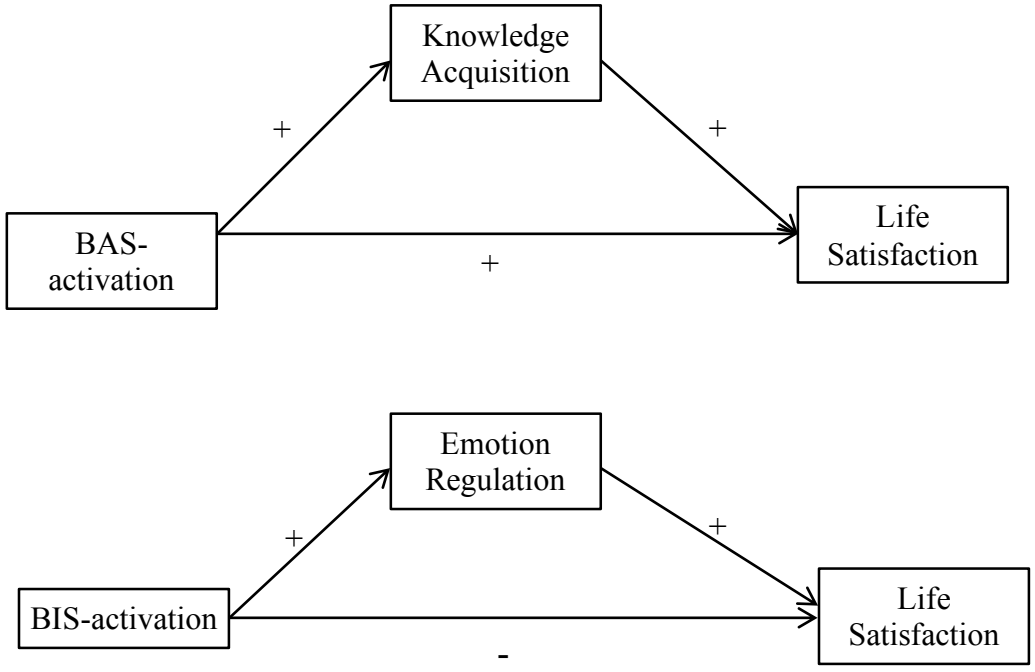


Figure 8. Relationship between Personality (BIS, BAS) and Life Satisfaction Mediated by SST (Hypotheses 2e & 2f)

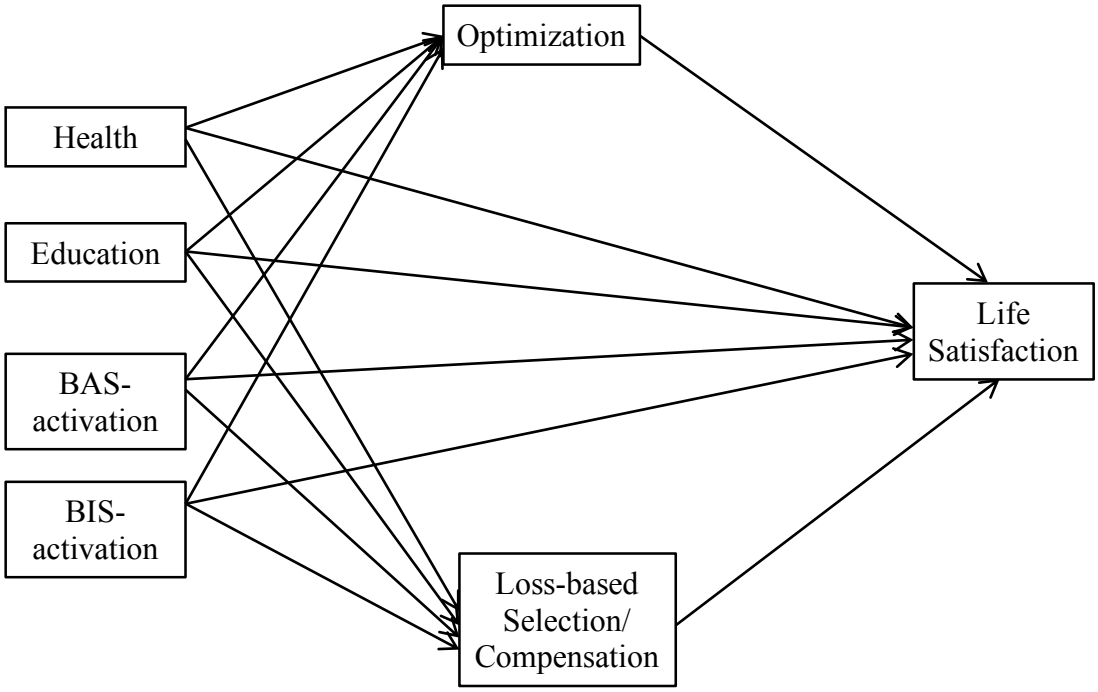


Figure 9. Path Model for Life Satisfaction Mediated by SOC

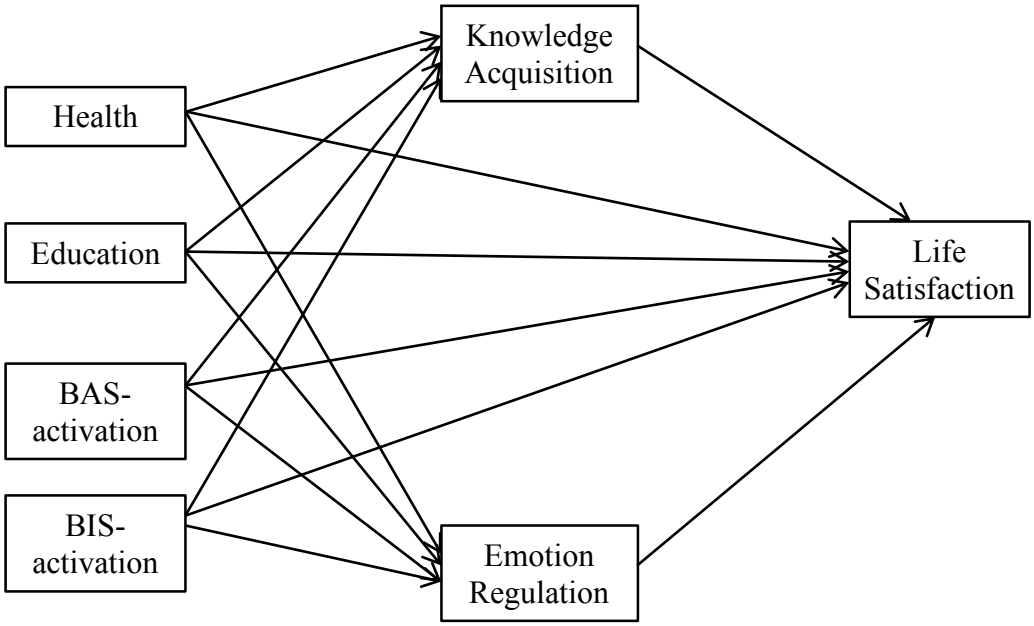


Figure 10. Path Model for Life Satisfaction Mediated by SST

Chapter IV. Results

This study examined how different goal achievement strategies based on Selection, Optimization, and Compensation (SOC) and different goal types based on Socioemotional Selectivity Theory (SST) could mediate relationships between life satisfaction and individual factors (specifically, health, education level, and neuropsychological systems in personality).

Four factors were required to test for a mediation effect (Baron & Kenny, 1986). First, a predictor variable had to predict a criterion variable significantly. Second, a predictor variable had to predict a mediator variable significantly. Third, a predictor variable had to not predict a criterion variable significantly when a mediator was in the model. Fourth, a mediator variable had to predict a criterion variable after controlling for a predictor variable. When each hypothesis was tested, it was explained that which ones worked as criterion, predictor, and mediator variables. Although the mediation analyses were conducted based on Baron and Kenny (1986), bootstrap methods were also employed using PROCESS within SPSS (Preacher & Hayes, 2004) in order to check if there were significant differences between these two methods of testing mediation effects. According to Preacher and Hayes (2004), we could get point estimates and confidence intervals when we used the bootstrapping method. Because there were no significant differences in mediation effects between these two methods, only the results from the first method were reported in this results section.

Throughout this study, mediation analyses were used to investigate how individual factors, health, education level, or neuropsychological systems in personality, influenced goal achievement strategies and different goal types and how these strategies and goal types based on SOC and SST influenced life satisfaction (Bal et al., 2010; Freund et al., 1999; Lang, 2000; Lang & Carstensen, 2002; Ouwehand et al., 2007). Although these mediation hypotheses were based

on theory and previous research, there were no significant mediation effects in the present study. Because no mediation hypotheses were supported, as were shown in the sections that follow, other previous studies were reviewed to find other possible explanations of the relationships among individual factors, life satisfaction, and goal achievement strategies or social goal types. A few previous studies explained relationships between individual factors and life satisfaction using moderators such as social support, coping strategies, resilience, and so on (Ballew et al., 2012; Dumitrache, Rubio, & Rubio-Herrera, 2017; Wang, Wong, & Yeh, 2016). These researchers believed that moderators could work as buffering or protective factors for maintaining or improving life satisfaction depending on different individual factors. That is, different goal achievement strategies and different goal types might be buffering or protective factors for maintaining older adults' life satisfaction when they experienced declines in their resources. To test this, moderation analysis could be conducted.

In order to supplement mediation analysis, moderation analysis was conducted using a hierarchical multiple regression approach based on Baron and Kenny (1986). Bootstrap methods were also performed using PROCESS within SPSS (Preacher & Hayes, 2004) to check if there were significant differences between these two methods of testing moderation effects. Because there were no significant differences in moderation effects between these two methods of testing, only the results from the first method were reported. To avoid potentially problematic high multicollinearity with the interaction term, the variables were centered and an interaction term was created. These moderation effects were reported in figures after each test of mediation.

Descriptive analysis

The means and standard deviations of independent variables and dependent variables for the sample were presented in Table 1.

Hypothesis 1a

Hypothesis 1a was that older adults who were in good health would use more optimization strategies for pursuing their life goals and this would predict higher life satisfaction after controlling for age, marital status, and religious activity based on mediation effect of optimization strategies. In this study, the control variables were age, marital status, and religious activity. Gender was omitted from the reported hierarchical regression analyses because it did

Table 1.
Means and Standard Deviations of Independent Variables and Dependent Variables (N=208)

	Mean	SD
Age (66-97)	81.27	7.36
Health (11-49)	35.54	11.61
Education Level (1-8)	4.41	2.02
BAS-activation (13-49)	33.87	7.83
BIS-activation (1-3.86)	2.28	.81
Optimization (1.25-4.33)	3.19	.86
Loss-based Selection (1.33-4.58)	2.79	.84
Compensation (1.58-4.58)	2.82	.82
Knowledge Acquisition Goals (-1.90-1.90)	.06	1.21
Emotion Regulation Goals (-1-1.78)	.74	.78
Life Satisfaction (1.20-7)	4.64	1.64

Note. Health and BAS-activation used composite scores.
Optimization: Uses goal-relevant means for achieving goals; Loss-based Selection: Changes goals or goal systems; Compensation: Activates unused internal or external resources for pursuing goals; BAS-activation: personality construct of sensitivity for reward and approach motivation; BIS-activation: personality construct of sensitivity for punishment and avoidance motivation.

not significantly predict the dependent variable, life satisfaction.

In the first hierarchical regression, the independent variable was health and the dependent variable was life satisfaction. For mediation to be present, health had to predict life satisfaction significantly. Simple correlation analysis showed that the relationship between health and life satisfaction was statistically significant (r=.45, p<.001, Table 2). That is, older adults who had better health reported higher life satisfaction. Also, there were significant relationships of age and religious activity to life satisfaction. Those who were younger and participated in more religious activities reported higher life satisfaction. There was no significant relationship between marital status and life satisfaction.

In the regression analysis, health significantly predicted life satisfaction after controlling for age, marital status, and religious activity (Table 2), R^2 = .19, $F(1, 203) = 49.67$, p<.001. That is, 19% of the variance in life satisfaction was explained by health. Thus, the first condition for a mediation effect was met.

In the second hierarchical regression, health was the independent variable and

Table 2.
Hierarchical Regression of Life Satisfaction on Covariates and Health (H1a) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17**	.03*	.01	.02	.04
2	Marital	-.03	.00	.13	.10	.09
3	Religious	.14*	.02*	.27**	.10	.16**
4	Health	.45***	.19***	.07***	.01	.50***
	(Constant)			.40	1.52	

Note. Marital: Marital status (0=Single, Divorced, & Widowed, 1=Married); Religious: Religious activity.
Cumulative R^2 = .24; adjusted R^2 = .22.
*p<.05, **p<.01, ***p<.001.

optimization strategies were the dependent variable. For mediation to be present, health had to predict optimization strategies significantly.

Simple correlation analysis showed that there was a statistically significant relationship between health and optimization (r=.49, p<.001, Table 3). That is, older adults with higher levels of health used more optimization strategies to achieve their goals. In addition, there were significant relationships between optimization strategies and age and marital status. Those who were younger and single were more likely to engage in optimization strategies. The relationship between optimization strategies and religious activity was not statistically significant.

Health significantly predicted optimization strategies after controlling for age, marital status, and religious activity (Table 3), R^2 = .18, F(1, 203) = 48.81, p<.001. That is, 18% of the variance in optimization strategies was accounted for by health. Thus, the second condition for a mediation effect was met.

In the third regression analysis, health and optimization strategies were the independent variables and life satisfaction was the dependent variable. In this analysis, optimization strategies were tested as a mediator.

Zero-order correlation analysis showed that the relationship between optimization and life satisfaction was statistically significant (r=.38, p<.001, Table 4). People who used more optimization strategies were more satisfied with their life.

The third requirement for mediation is that the effect of health was not statistically significant when optimization strategies were included in the model. However, the effect of health on life satisfaction was still statistically significant (B=.05, p<.001, Table 4). Health significantly predicted life satisfaction, R^2 = .19, F(1, 203)=49.67, p<.001. That is, 19% of the variance in life satisfaction was explained by health. Thus, the third condition for mediation was

Table 3.

Hierarchical Regression of Use of Optimization Strategies of Goal-Pursuit on Covariates and Health (H1a) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.24***	.06**	.00	.01	.01
2	Marital	-.17**	.01	-.04	.05	-.05
3	Religious	-.05	.00	-.03	.05	-.04
4	Health	.49***	.18***	.04***	.01	.48***
	(Constant)			2.04*	.79	

Note. Marital: Marital status; Religious: Religious activity.
Cumulative R^2 = .25; adjusted R^2 = .23.
*p<.05, **p<.01, ***p<.001.

not satisfied.

The fourth requirement for mediation effect was optimization strategies had to predict significantly life satisfaction after controlling for health. Optimization strategies significantly predicted life satisfaction after controlling for health (B=.43, p<.01, Table 4). That is, optimization strategies were a predictor of life satisfaction, R^2 = .04, F(1, 202)=10.72, p<.01. Optimization strategies accounted for 4% of the variance in life satisfaction. Thus, the fourth condition for mediation was met.

According to these three analyses, we could conclude that older adults who had better health used more optimization strategies and reported higher life satisfaction. However, optimization strategies did not mediate the relationship between health and life satisfaction. Rather, health directly influenced life satisfaction. Thus, hypothesis 1a was partially supported.

To supplement the test of mediation, moderation analysis was conducted using hierarchical multiple regression. In this study, older adults who had better health reported that their subjective health was from very good to excellent and their daily behaviors were not

Table 4.

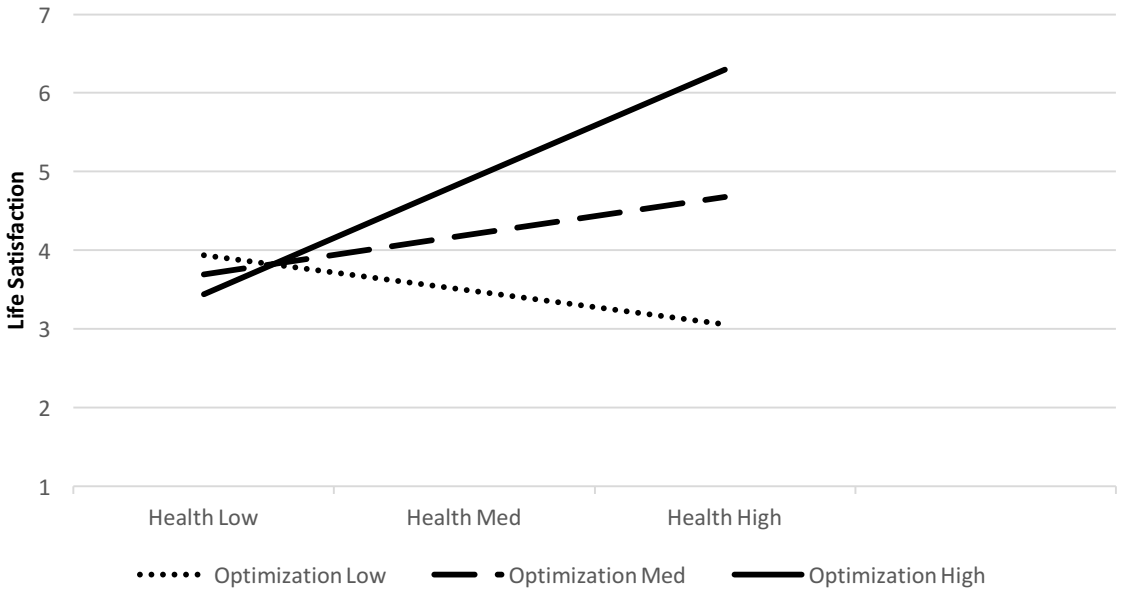
Hierarchical Regression of Life Satisfaction on Covariates, Health, and Optimization Strategies (H1a) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17**	.03*	.01	.02	.04
2	Marital	-.03	.00	.14	.09	.10
3	Religious	.14*	.02*	.28**	.10	.17**
4	Health	.45***	.19***	.05***	.01	.39***
5	Optimization	.38***	.04**	.43**	.13	.23**
	(Constant)			-.49	1.51	

Note. Marital: Marital status; Religious: Religious activity.
Cumulative R^2 = .27; adjusted R^2 = .26.
*p<.05, **p<.01, ***p<.001.

influenced by their health; older adults who had poorer health reported that their subjective health was from fair to poor and they experienced difficulties in their daily behavior due to their health. In this analysis, the interaction term between health and optimization strategies significantly predicted life satisfaction, R^2 = .28, $F(1, 204)=116.68$, $p<.001$, B=.09, $p<.001$. Examination of the interaction plot showed that at lower levels of health, older adults reported higher life satisfaction when they used optimization strategies less. In contrast, at higher levels of health, older adults were more satisfied with their life when they used optimization strategies more (Figure 11). Based on these analyses, we could conclude that there was a significant moderation effect of optimization strategies on the relationship between health and life satisfaction although there was no significant mediation effect by optimization strategies.

Figure 11. Moderation Effect of Optimization Strategies on Relationship between Health and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

Hypothesis 1b

Hypothesis 1b iwas that older adults who were in poorer health would use more loss-based selection and compensation strategies and this would predict higher life satisfaction after controlling for age, marital status, and religious activity based on the mediation effect of loss-based selection and compensation strategies. In order to test this hypothesis, loss-based selection and compensation strategies were tested separately.

Loss-based selection. In the first hierarchical regression, the independent variable was health and the dependent variable was life satisfaction. For mediation to be present, health had to significantly predict life satisfaction.

In the regression analysis, health significantly predicted life satisfaction after controlling for age, marital status, and religious activity (Table 2), $R^2 = .19$, $F(1, 203) = 49.67$, $p<.001$. That

is, 19% of the variance in life satisfaction was explained by health. Thus, the first condition for a mediation effect was met.

In the second hierarchical regression, health was the independent variable and loss-based selection was the dependent variable. For mediation to be present, health had to predict loss-based selection strategies significantly.

Simple correlations showed a statistically significant relationship between health and loss-based selection (r=-.49, p<.001, Table 5). That is, people who had lower levels of health used more loss-based selection strategies in order to achieve their goals. In addition, there were significant relationships of loss-based selection to age and marital status. Those who were older and married were more likely to engage in loss-based selection strategies. But the relationship between loss-based selection and religious activity was not significant.

In this analysis, health significantly predicted loss-based selection strategies after controlling for age, marital status, and religious activity (Table 5), R^2 = .17, $F(1, 203) = 48.81$, p<.001. That is, 17% of the variance in loss-based selection strategy was accounted for by health. In the third regression analysis, health and loss-based strategies were the independent variables and life satisfaction was the dependent variable. In this analysis, a potential mediator was loss-based selection strategies.

Zero-order correlation analysis showed that the relationship between loss-based selection strategies and life satisfaction was statistically significant (r=-.38, p<.001, Table 6). Older adults who more used loss-based selection strategies indicated lower life satisfaction.

The third requirement for mediation was that the effect of health was not statistically significant when loss-based selection strategies were included in the model. However, the effect of health on life satisfaction was still statistically significant (B=.06, p<.001, Table 6), R^2 = .19,

Table 5.

Hierarchical Regression of Use of Loss-base Selection Strategies of Goal-Pursuit on Covariates and Health (H1b) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	.24***	.06***	.00	.01	.02
2	Marital	.14*	.00	.01	.05	.01
3	Religious	.05	.00	.03	.05	.04
4	Health	-.49***	.17***	-.03***	.01	-.47***
	(Constant)			3.77***	.78	

Note. Marital: Marital status; Religious: Religious activity.
Cumulative R^2 = .24; adjusted R^2 = .22.
*p<.05, **p<.01, ***p<.001.

$F(1, 203)=49.67$, $p<.001$. That is, 19% of the variance in life satisfaction was explained by health. Thus, the third condition for mediation was not satisfied.

The fourth requirement for mediation effect was that loss-based selection strategies had to predict life satisfaction significantly after controlling for health. In this analysis, loss-based selection strategies significantly predicted life satisfaction after controlling for health (B=-.42, $p<.01$, Table 6) but in the opposite direction from the study hypothesis. That is, older adults who used more loss-based selection strategies reported lower life satisfaction after controlling for health. Although loss-based selection strategies were a predictor of life satisfaction, $R^2 = .04$, $F(1, 202)=9.90$, $p<.01$, this prediction was the opposite of what was predicted. Loss-based selection strategies accounted for 4% of the variance in life satisfaction. Thus, the fourth condition for mediation was not met.

According to these three analyses, we could conclude that older adults who had poorer health used more loss-based selection strategies and reported lower life satisfaction. However,

Table 6.

Hierarchical Regression of Life Satisfaction on covariates, Health, and Loss-based Selection Strategies (H1b) (N=208)

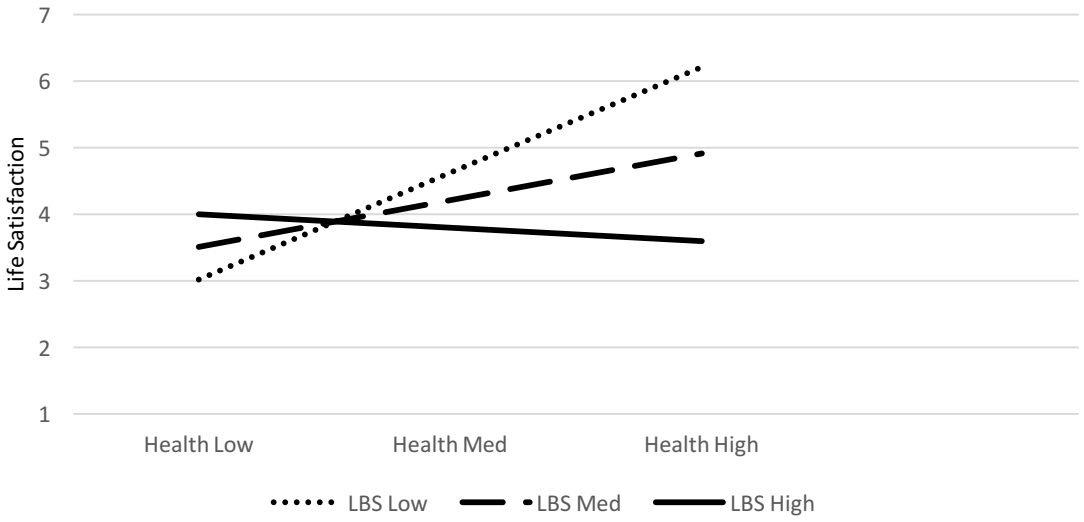
Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17**	.03*	.01	.02	.05
2	Marital	-.03	.00	.13	.09	.09
3	Religious	.14*	.02*	.28**	.10	.17**
4	Health	.45***	.19***	.06***	.01	.39***
5	Loss-based	-.38***	.04**	-.42**	.14	-.22**
	(Constant)			2.00	1.57	

Note. Marital: Marital status; Religious: Religious activity; Loss-based: Loss-based selection. Cumulative R^2 = .27; adjusted R^2 = .25.
*p<.05, **p<.01, ***p<.001.

loss-based selection strategies did not mediate the relationship between health and life satisfaction. Rather, health directly influenced life satisfaction. In addition, loss-based selection was negatively related to life satisfaction Thus, hypothesis 1b (loss-based selection) was only partially supported.

In order to supplement the test of mediation, moderation analysis was conducted. In this analysis, the interaction term between health and loss-based selection strategies significantly predicted life satisfaction, R^2 = .26, F(1, 204)=104.71, p<.001, B=-.09, p<.001. Examination of the interaction plot showed that at lower levels of health, older adults reported higher life satisfaction when they used more loss-based selection strategies. In contrast, at higher levels of health older adults showed higher life satisfaction when they used loss-based selection strategies less (Figure 12). Based on these analyses, we could conclude that there was a significant moderation effect of loss-based selection on the relationship between health and life satisfaction although there was no significant mediation effect by loss-based selection strategies.

Figure 12. Moderation Effect of Loss-based Selection Strategies on Relationship between Health and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

Compensation. In the first hierarchical regression, the independent variable was health and the dependent variable was life satisfaction. For mediation to be present, health had to predict life satisfaction significantly.

In the regression analysis, health significantly predicted life satisfaction after controlling for age, marital status, and religious activity (Table 2), $R^2 = .19$, $F(1, 203) = 49.67$, $p<.001$. That is, 19% of the variance in life satisfaction was explained by health. Thus, the first condition for a mediation effect was met.

In the second hierarchical regression, the independent variable was health and the dependent variable was compensation strategies. For mediation to be present, health has to significantly predict compensation strategies.

Zero-order analysis showed that there was a statistically significant relationship between health and compensation strategies ($r=-.49$, $p<.001$, Table 7). That is, people who had poorer

health focused more on compensation strategies in order to achieve their goals. In addition, there were significant relationships between compensation strategies and age and marital status. Those who were older and married were more likely to employ compensation strategies. But there was no significant relationship between religious activity and compensation strategies.

In this analysis, health significantly predicted compensation strategies after controlling for age, marital status, and religious activity (Table 7), $R^2 = .16$, $F(1, 203) = 43.95$, $p<.001$. That is, 16% of the variance in compensation strategies was accounted for by health. Thus, the second condition for a mediation effect was met.

In the third regression analysis, health and compensation strategies were the independent variable and life satisfaction was the dependent variable. In this analysis, a potential mediator was compensation strategies.

Simple correlation showed that the relationship between compensation strategies and life satisfaction was statistically significant ($r=-.36$, $p<.001$, Table 8). People who used more

Table 7.

Hierarchical Regression of Use of Compensation Strategies of Goal-Pursuit on Covariates and Health (H1b) (N=208)

Step	Variable	r	R^2 added	B	SE_B	Beta
1	Age	.25***	.06***	.00	.01	.02
2	Marital	.16**	.01	.03	.05	.04
3	Religious	.09	.01	.06	.05	.08
4	Health	-.49***	.16***	-.03***	.01	-.46***
	(Constant)			3.60***	.75	

Note. Marital: Marital status; Religious: Religious activity.
Cumulative $R^2 = .24$; adjusted $R^2 = .23$.
*$p<.05$, **$p<.01$, ***$p<.001$.

compensation strategies reported lower life satisfaction.

Although the third requirement for mediation was that the effect of health was not significant when compensation strategies were included in the model. However, the effect of health on life satisfaction was still statistically significant (B=.06, $p<.001$, Table 8), $R^2 = .19$, $F(1, 203)=49.67$, $p<.001$. That is, 19% of the variance in life satisfaction was explained by health. Thus, the third condition for mediation was not satisfied.

The fourth requirement for mediation effect was compensation strategies had to predict life satisfaction significantly after controlling for health. Compensation strategies significantly predicted life satisfaction after controlling for health (B=-.43, $p<.01$, Table 8), but in the opposite direction from the study hypothesis. Older adults who used more compensation strategies reported lower life satisfaction. Although compensation strategies were a predictor of life satisfaction, $R^2 = .04$, $F(1, 202)=9.90$, $p<.01$, the direction of prediction was the opposite of what was predicted. Compensation strategies accounted for 4% of the variance in life satisfaction. Thus, the fourth condition for mediation was not met.

According to these three analyses, we could conclude older adults who had lower levels of health focused more on compensation strategies and indicated lower life satisfaction. However, compensation strategies did not mediate the relationship between health and life satisfaction. Rather, health directly influenced life satisfaction. And there was a negative relationship between compensation strategies and life satisfaction. Thus, hypothesis 1b (compensation) was only partially supported.

To supplement the test of mediation, moderation analysis was conducted. In this analysis, the interaction term between health and compensation strategies significantly predicted life satisfaction, $R^2 = .28$, $F(1, 204)=113.52$, $p<.001$, B=-.10, $p<.001$. Examination of the interaction

Table 8.

Hierarchical Regression of Life Satisfaction on Covariates, Health, and Compensation Strategies (H1b) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17**	.03*	.01	.02	.05
2	Marital	-.03	.00	.14	.09	.10
3	Religious	.14*	.02*	.30**	.10	.18**
4	Health	.45***	.19***	.06***	.01	.40***
5	Compensation	-.36***	.04**	-.43**	.14	-.21**
	(Constant)			1.94	1.57	

Note. Marital: Marital status; Religious: Religious activity.
Cumulative $R^2 = .27$; adjusted $R^2 = .25$.
*p<.05, **p<.01, ***p<.001.

plot showed that at lower levels of health, older adults were more satisfied with their life when they used more compensation strategies. In contrast, at higher levels of health older adults reported higher life satisfaction when they used compensation strategies less (Figure 13).

Based on these analyses, we could conclude that there was a significant moderation effect of compensation strategies on the relationship between health and life satisfaction although there was no significant mediation by compensation strategies.

Hypothesis 1c

Hypothesis 1c was that older adults who had higher levels of education would use more optimization strategies and this would predict higher life satisfaction after controlling for age, marital status, and religious activity based on the mediation effect of optimization strategies on the relationship between educational level and life satisfaction.

In the first hierarchical regression, the independent variable was educational level and the

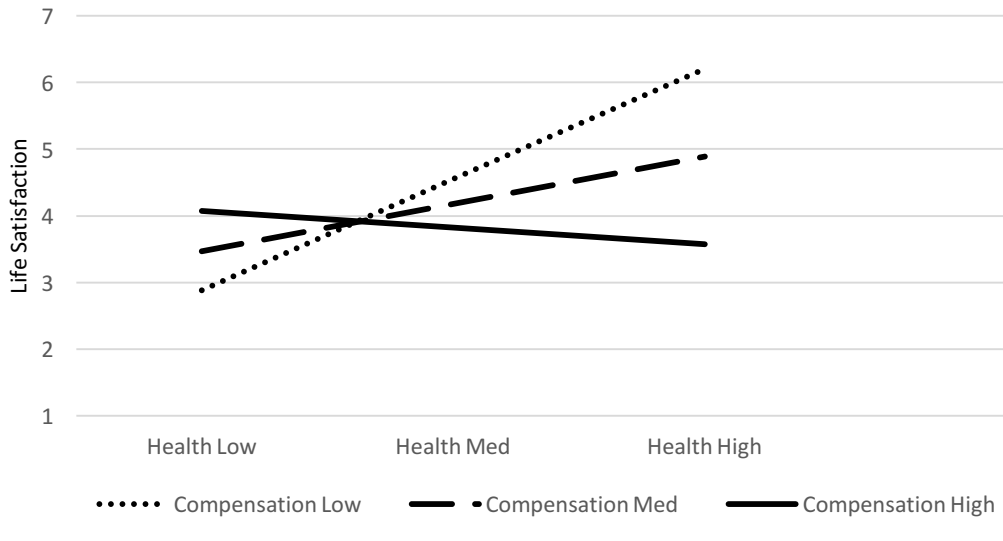
dependent variable was life satisfaction. For mediation to be present, education level had to predict life satisfaction significantly.

Simple correlation analysis showed that the relationship between education level and life satisfaction was statistically significant (r=.40, p<.001, Table 9). That is, people who had higher levels of education reported higher life satisfaction.

In the regression analysis, education level significantly predicted life satisfaction after controlling for age, marital status, and religious activity (Table 9), R^2 = .15, $F(1, 203) = 36.74$, p<.001. That is, 15% of the variance in life satisfaction was explained by education level. Thus, the first condition for mediation was met.

In the second hierarchical regression, education levels were the independent variable and use of optimization strategies was the dependent variable. For mediation to be present, education level had to significantly predict optimization strategies.

Figure 13. Moderation Effect of Compensation Strategies on Relationship between Health and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

There was a statistically significant relationship between education level and optimization strategies (r=.31, p<.001). That is, older adults who had higher levels of education used more optimization strategies in order to achieve their goals.

In this analysis, education level significantly predicted optimization strategies after controlling for age, marital status, and religious activity (Table 10), R^2 = .05, F(1, 203) = 10.98, p<.01. That is, 5% of the variance in optimization strategies was accounted for by education level. Thus, the second condition for a mediation effect was met.

In the third regression analysis, education level and optimization strategies were the independent variables and life satisfaction was the dependent variable. In this analysis, optimization strategies were tested as a mediator.

The third requirement for mediation was that the effect of education level was not statistically significant when optimization strategies were included in the model. However, the effect of education level on life satisfaction was statistically significant (B=.28, p<.001, Table 11), R^2 = .15, F(1, 203)=36.74, p<.001. That is, 15% of the variance in life satisfaction was

Table 9.

Hierarchical Regression of Life Satisfaction on Covariates and Education Level (H1c) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17**	.03*	.00	.02	.00
2	Marital	-.03	.00	.07	.10	.05
3	Religious	.14*	.02*	.28**	.11	.17**
4	Education	.40***	.15***	.34***	.06	.42***
	(Constant)			2.22	1.46	

Note. Marital: Marital status; Religious: Religious activity; Education: Education level.
Cumulative R^2 = .19; adjusted R^2 = .18.
*p<.05, **p<.01, ***p<.001.

explained by education level. Thus, the third condition for mediation was not satisfied.

The fourth requirement for mediation effect was optimization strategies had to predict life satisfaction significantly after controlling for education level. In this analysis, optimization strategies significantly predicted life satisfaction after controlling for education levels (B=.58, $p<.001$, Table 11), $R^2 = .08$, $F(1, 202)=22.88$, $p<.001$. Optimization strategies accounted for 8% of the variance in life satisfaction. Thus, the fourth condition for mediation was met.

According to these three analyses, we could conclude that older adults who had higher levels of education used more optimization strategies and indicated higher life satisfaction. However, optimization strategies did not mediate the relationship between education level and life satisfaction. Rather, education level directly influenced life satisfaction. Thus, hypothesis 1c was only partially supported.

In order to supplement the test of mediation, moderation analysis was conducted. In this analysis, the interaction term between education level and optimization strategies significantly

Table 10.

Hierarchical Regression of Optimization Strategies on Covariates and Education Level (H1c) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.24**	.06**	-.01	.01	-.11
2	Marital	-.17*	.01	-.07	.05	-.09
3	Religious	-.05	.00	-.04	.06	-.05
4	Education	.31***	.05**	.10**	.03	.24**
	(Constant)			3.99***	.80	

Note. Marital: Marital status; Religious: Religious activity; Education: Education level.
Cumulative $R^2 = .12$; adjusted $R^2 = .10$.
*$p<.05$, **$p<.01$, ***$p<.001$.

predicted life satisfaction, $R^2 = .15$, $F(1, 204)=48.26$, $p<.001$, B=.38, $p<.001$.Examination of the interaction plot showed a significant moderation effect of optimization strategies on the relationship between education level and life satisfaction. At lower levels of education, older adults reported higher life satisfaction when they used optimization strategies less. In contrast, at higher levels of education older adults were more satisfied with their life when they used more optimization strategies at higher levels of education (Figure 14). Based on these analyses, we could conclude that there was a significant moderation effect of optimization strategies on the relationship between education level and life satisfaction although there was no significant mediation effect by optimization strategies.

Hypothesis 1d

Hypothesis 1d was that older adults who had lower levels of education would use more

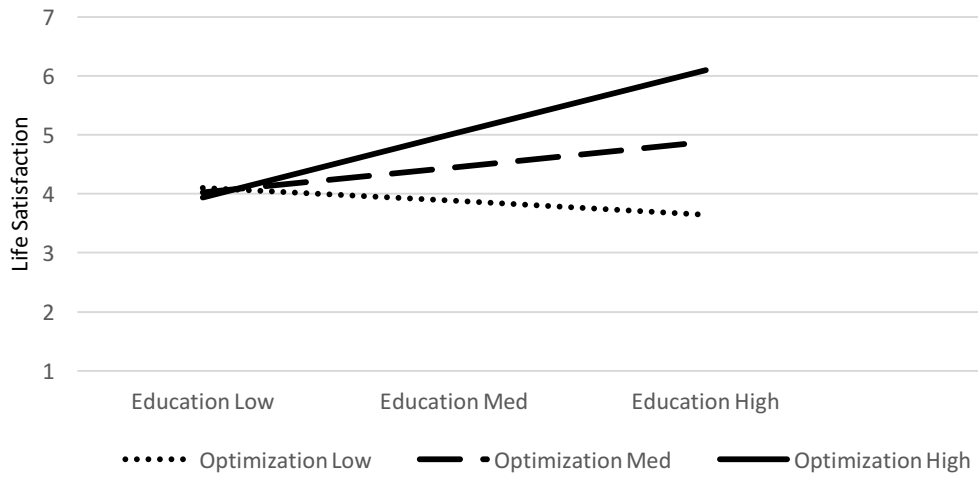
Table 11.

Hierarchical Regression of Life Satisfaction on Covariates, Education Level, and Optimization Strategies (H1c) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17*	.03*	.01	.02	.03
2	Marital	-.03	.00	.11	.09	.08
3	Religious	.14*	.02*	.30**	.10	.18**
4	Education	.40***	.15***	.28***	.06	.35***
5	Optimization	.38***	.08***	.58***	.12	.31***
	(Constant)			-.11	1.47	

Note. Marital: Marital status; Religious: Religious activity; Education: Education level.
Cumulative $R^2 = .27$; adjusted $R^2 = .26$.
*$p<.05$, **$p<.01$, ***$p<.001$.

Figure 14. Moderation Effect of Optimization Strategies on Relationship between Education and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

loss-based selection strategies and compensation strategies and this would predict higher life satisfaction based on the mediation effects of loss-based selection and compensation strategies on the relationship between education level and life satisfaction. In order to test these hypotheses, loss-based selection strategies and compensation strategies were tested separately.

Loss-based selection. In the first hierarchical regression, the independent variable was education level and the dependent variable was life satisfaction. For mediation to be present, education level had to predict life satisfaction significantly.

In the regression analysis, education level significantly predicted life satisfaction after controlling for age, marital status, and religious activity (Table 9), $R^2 = .15$, $F(1, 203) = 36.74$, $p<.001$. That is, 15% of the variance in life satisfaction was explained by education level. Thus, the first condition for a mediation effect was met.

In the second hierarchical regression, education level was the independent variable and

use of loss-based selection strategies was the dependent variable. For mediation to be present, education level had to predict loss-based selection strategies significantly.

Simple correlation analysis showed that there was a statistically significant relationship between education level and loss-based selection strategies (r=-.32, p<.001, Table 12). That is, older adults who had lower levels of education used more loss-based selection strategies in order to achieve their goals.

In this analysis, education level significantly predicted loss-based selection strategies after controlling for age, marital status, and religious activity (Table 12), R^2 = .07, F(1, 203) = 12.95, p<.01. That is, 7 % of the variance in loss-based selection strategies was accounted for by education levels. Thus, the second condition for a mediation effect was met.

In the third regression analysis, education level and loss-based strategies were the independent variables and life satisfaction was the dependent variable. In this analysis, a potential mediator was loss-based selection strategies.

The third requirement for mediation was that the effect of education level was not statistically significant when loss-based selection strategies were included in the model. However, the effect of education level on life satisfaction was statistically significant (B=.28, p<.001, Table 13), R^2 = .15, F(1, 203)=36.74, p<.001. That is, 15% of the variance in life satisfaction was explained by education level. Thus, the third condition for mediation was not satisfied.

The fourth requirement for mediation effect was loss-based selection strategies had to significantly predict life satisfaction after controlling for education level. In this analysis, loss- based selection strategies significantly predicted life satisfaction after controlling for education level (B=-.57, p<.001, Table 13) but in the opposite direction from the study

hypothesis. That is, older adults who used more loss-based selection strategies reported lower life satisfaction. Although loss-based selection strategies were a predictor of life satisfaction, $R^2 = .07$, $F(1, 202)=20.180$, $p<.001$, this prediction was the opposite of what was predicted. Loss-based selection strategies accounted for 7% of the variance in life satisfaction. Thus, the fourth condition for mediation was not met.

According to these three analyses, we could conclude that older adults who had lower education level used more loss-based selection strategies and reported lower life satisfaction. However, loss-based selection strategies did not mediate the relationship between education levels and life satisfaction. Rather, education level directly influenced life satisfaction. In addition, loss-based selection strategies were negatively related to life satisfaction. Thus, hypothesis 1d (loss-based selection) was only partially supported.

In order to supplement the test of mediation, moderation analysis was conducted. In this analysis, the interaction term between education level and loss-based selection strategies significantly predicted life satisfaction, $R^2 = .16$, $F(1, 204)=52.15$, $p<.001$, B=-.41, $p<.001$.

Table 12.

Hierarchical Regression of Loss-based Selection Strategies on Covariates and Education Level (H1d) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	.24***	.06***	.01	.01	.12
2	Marital	.14*	.00	.04	.05	.05
3	Religious	.05	.00	.03	.06	.04
4	Education	-.32***	.07**	-.11***	.03	-.26***
	(Constant)			2.04**	.78	

Note. Marital: Marital status; Religious: Religious activity; Education: Education level.
Cumulative $R^2 = .12$; adjusted $R^2 = .11$.
*$p<.05$, **$p<.01$, ***$p<.001$.

Table 13.

Hierarchical Regression of Life Satisfaction on Covariates, Education Level, and Loss-based Selection Strategies (H1d) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17*	.03*	.01	.02	.03
2	Marital	-.03	.00	.09	.09	.07
3	Religious	.14*	.02*	.30**	.10	.18**
4	Education	.40***	.15***	.28***	.06	.35***
5	Loss-based	-.38***	.07***	-.57***	.13	-.29***
	(Constant)			3.38*	1.42	

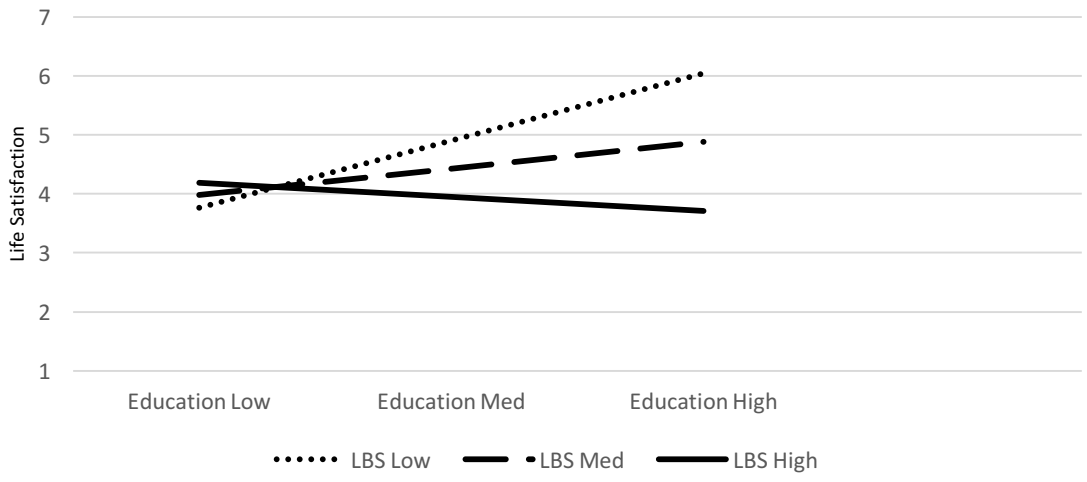
Note. Marital: Marital status; Religious: Religious activity; Education: Education levels; Loss-based: Loss-based selection.
Cumulative $R^2 = .27$; adjusted $R^2 = .25$.
*$p<.05$, **$p<.01$, ***$p<.001$.

Examination of the interaction plot showed that at lower levels of education, older adults reported higher life satisfaction when they used more loss-based selection strategies. In contrast, older adults with higher levels of education indicated higher life satisfaction when they used loss-based selection strategies less (Figure 15). Based on these analyses, we could conclude that there was a significant moderation effect of loss-based selection strategies on the relationship between education level and life satisfaction although there was no significant mediation effect by loss- based selection strategies.

Compensation. In the first hierarchical regression, the independent variable was education level and the dependent variable was life satisfaction. For mediation to be present, education level had to predict life satisfaction significantly.

In the regression analysis, education level significantly predicted life satisfaction after

Figure 15. Moderation Effect of Loss-Based Selection Strategies on Relationship between Education and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

controlling for age, marital status, and religious activity (Table 9), $R^2 = .15$, $F(1, 203) = 36.74$, $p<.001$. That is, 15% of the variance in life satisfaction was explained by education level. Thus, the first condition for a mediation effect was met.

In the second hierarchical regression, the independent variable was education level and the dependent variable was compensation strategies. For mediation to be present, education had to significantly predict compensation strategies.

Simple correlation analysis showed that there was a statistically significant relationship between education levels and compensation strategies (r=-.32, $p<.001$, Table 14). That is, people who had lower levels of education levels focused on more compensation strategies in order to achieve their goals.

In this analysis, education level significantly predicted compensation strategies after controlling for age, marital status, and religious activity (Table 14), $R^2 = .05$, $F(1, 203) = 11.45$,

Table 14.

Hierarchical Regression of Compensation Strategies on Covariates and Education Level (H1d) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	.25***	.06***	.01	.01	.12
2	Marital	.16*	.01	.06	.05	.08
3	Religious	.09	.01	.07	.05	.08
4	Education	-.32***	.05**	-.10**	.03	-.25**
	(Constant)			1.89*	.76	

Note. Marital: Marital status; Religious: Religious activity; Education: Education level
Cumulative R^2 = .13; adjusted R^2 = .11.
*p<.05, **p<.01, ***p<.001.

p<.01. That is, 5% of the variance in compensation strategies was accounted for by education level. Thus, the second condition for a mediation effect was met.

In the third regression analysis education level and compensation strategies were the independent variable and life satisfaction was the dependent variable. In this analysis, a potential mediator was compensation strategies.

The third requirement for meditation was that the effect of education level was not statistically significant when compensation strategies were included in the model. However, the effect of education level on life satisfaction was statistically significant when compensation strategies were in the model (B=.29, p<.001, Table 15), R^2 = .15, F(1, 203)=36.74, p<.001. That is, 15% of the variance in life satisfaction was explained by education level. Thus, the third condition for mediation was not satisfied.

The fourth requirement for mediation effect was compensation strategies must significantly predict life satisfaction after controlling for education levels. Although compensation strategies significantly predicted life satisfaction after controlling for education

level (B=-.58, $p<.001$, Table 15), the direction was the opposite of what was predicted. That is, older adults who used more compensation strategies indicated lower life satisfaction. Although compensation strategies were a predictor of life satisfaction, $R^2 = .07$, $F(1, 202)=20.11$, $p<.001$, the direction of prediction was the opposite of what was predicted. Compensation strategies accounted for 7% of the variance in life satisfaction. Thus, the fourth condition for mediation was not met.

According to these three analyses, we can conclude older adults who had lower education level focused more on compensation strategies and reported lower life satisfaction. However, compensation strategies did not mediate the relationship between education level and life satisfaction. Rather, education level directly affected life satisfaction. And there was a negative relationship between compensation strategies and life satisfaction. Thus, hypothesis 1d (compensation) was only partially supported.

Table 15.

Hierarchical Regression of Life Satisfaction on Covariates Education Level, and Compensation Strategies (H1d) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17*	.03*	.01	.02	.04
2	Marital	-.03	.00	.11	.09	.08
3	Religious	.14*	.02*	.32**	.10	.19**
4	Education	.40***	.15***	.29***	.06	.35***
5	Compensation	-.36***	.07***	-.58***	.13	-.29***
	(Constant)			3.31*	1.42	

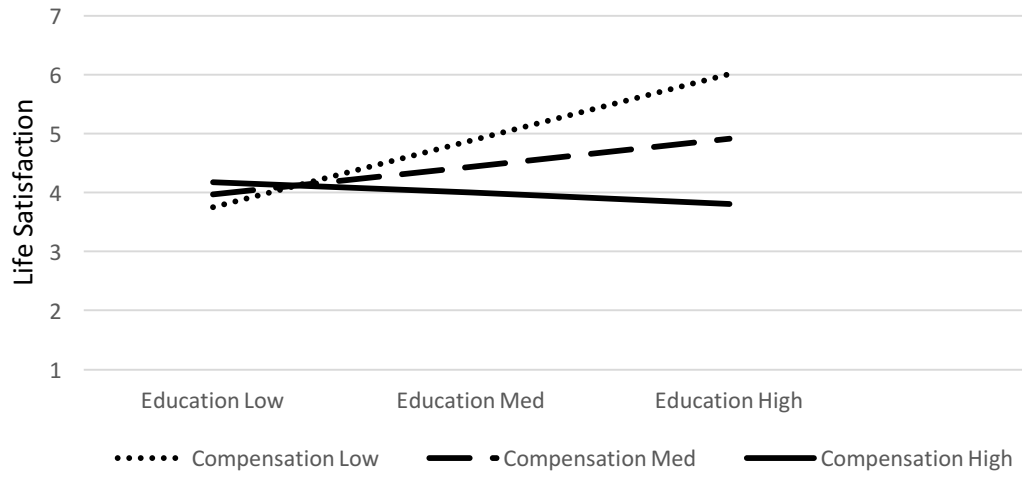
Note. Marital: Marital status; Religious: Religious activity; Education: Education level.
Cumulative $R^2 = .27$; adjusted $R^2 = .25$.
*$p<.05$, **$p<.01$, ***$p<.001$.

To supplement the test of mediation, moderation analysis was conducted. In this analysis, the interaction term between education levels and compensation strategies significantly predicted life satisfaction, $R^2 = .14$, $F(1, 204)=45.88$, $p<.001$, B=-.40, $p<.001$. Examination of the interaction plot showed that at lower levels of education, older adults were more satisfied with their life when they used more compensation strategies. In contrast, at higher levels of education older adults reported higher life satisfaction when they used compensation strategies less (Figure 16). Based on these analyses, we could conclude that there was a significant moderation effect of compensation strategies on the relationship between education level and life satisfaction although there was no significant mediation effect by compensation strategies.

Hypothesis 1e

Hypothesis 1e was that older adults who had higher BAS-activation would use more

Figure 16. Moderation Effect of Compensation Strategies on Relationship between Education and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

optimization strategies and this would predict higher life satisfaction based on the mediation effect of optimization strategies based on BAS-activation and life satisfaction after controlling for age, marital status, and religious activity.

In the first hierarchical regression, the independent variable was BAS and the dependent variable was life satisfaction. For mediation to be present, BAS had to predict life satisfaction significantly.

Simple correlation analysis showed that the relationship between BAS-activation and life satisfaction was statistically significant (r=.85, p<.001, Table 16). That is, people who had higher BAS-activation reported higher life satisfaction.

In the regression analysis, BAS-activation significantly predicted life satisfaction after controlling for age, marital status, and religious activity (Table 16), R^2 = .68, $F(1, 203) = 513.58$, p<.001. That is, 68% of the variance in life satisfaction was explained by BAS-activation. Thus, the first condition for a mediation effect was met.

In the second, hierarchical regression, BAS-activation was the independent variable and

Table 16.

Hierarchical Regression of Life Satisfaction on Covariates and BAS-activation (H1e) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17**	.03*	-.00	.01	-.20
2	Marital	-.03	.00	.03	.05	.02
3	Religious	.14*	.02*	.14*	.06	.09*
4	BAS	.85***	.68***	.18***	.01	.84***
	(Constant)			-1.41	.80	

Note. Marital: Marital status; Religious: Religious activity; BAS: BAS-activation.
Cumulative R^2 = .73; adjusted R^2 = .73.
*p<.05, **p<.01, ***p<.001.

optimization strategies were the dependent variable. For mediation to be present, BAS-activation has to significantly predict optimization strategies.

Simple correlation analysis showed that there was a statistically significant relationship between BAS-activation and optimization strategies (r=.44, p<.001, Table 17). That is, people who had higher BAS-activation used more optimization strategies in order to achieve their goals.

In this analysis, BAS-activation significantly predicted optimization strategies after controlling for age, marital status, and religious activity (Table 17), R^2 = .17, F(1, 203) = 44.11, p<.001. That is, 17% of the variance in optimization strategies was accounted for by BAS-activation. Thus, the second condition for a mediation effect was met.

In the third regression analysis, BAS-activation and optimization strategies were the independent variables and life satisfaction was the dependent variable. In this analysis, optimization strategies were tested as a mediator.

The third requirement for mediation was that the effect of BAS-activation was not statistically significant when optimization strategies were included in the model. However, the

Table 17.

Hierarchical Regression of Optimization Strategies on Covariates and BAS-activation (H1e) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.24**	.06**	-.02*	.01	-.13*
2	Marital	-.17**	.01	-.08	.05	-.11
3	Religious	-.05	.00	-.08	.05	-.09
4	BAS	.44***	.17***	.05***	.01	.42***
	(Constant)			3.25***	.70	

Note. Marital: Marital status; Religious: Religious activity; BAS: BAS-activation.
Cumulative R^2 = .24; adjusted R^2 = .22.
*p<.05, **p<.01, ***p<.001.

effect of BAS-activation on life satisfaction was statistically significant when optimization strategies were in the model in this analysis (B=.17, $p<.001$, Table 18), $R^2 = .68$, $F(1, 203)=513.58$, $p<.001$. That is, 68% of the variance in life satisfaction was explained by BAS-activation. Thus, the third condition for mediation was not satisfied.

The fourth requirement for mediation effect was optimization strategies had to significantly predict life satisfaction after controlling for BAS-activation. In this analysis, optimization strategies did not predict life satisfaction after controlling for BAS-activation (B=.04, *ns*, Table 18), $R^2 = .00$, $F(1, 202)=.25$, *ns*. Thus, the fourth condition for mediation was not met.

According to these three analyses, we could conclude that older adults who had higher BAS-activation used more optimization strategies and reported higher life satisfaction. However, optimization strategies did not mediate the relationship between BAS-activation and satisfaction. Optimization strategies did not predict life satisfaction when BAS-activation was in the model. Rather, BAS-activation directly influenced life satisfaction. Thus, hypothesis 1e was only partially supported.

In order to supplement the test of mediation, moderation analysis was conducted. The interaction term between BAS-activation and optimization strategies significantly predicted life satisfaction, $R^2 = .03$, $F(1, 204)=25.66$, $p<.001$, B=.05, $p<.001$. Examination of the interaction plot showed that at lower BAS-activation, older adults reported higher life satisfaction when they used less optimization strategies. In contrast, at higher BAS-activation older adults were more satisfied with their life when they used more optimization strategies (Figure 17). Based on these analyses, we could conclude that there was a significant moderation effect of optimization

strategies on the relationship between BAS-activation and life satisfaction although there was no significant mediation effect by optimization strategies.

Hypothesis 1f

Hypothesis 1f was that older adults who had higher BIS-activation would use more loss-based selection strategies and compensation strategies and this would predict higher life satisfaction based on the mediation effect of these strategies on the relationship between BIS-activation and life satisfaction after controlling for age, marital status, and religious activity. In order to test this hypothesis, loss-based selection strategies and compensation strategies were tested separately.

Loss-based selection. In the first hierarchical regression, the independent variable was BIS and the dependent variable was life satisfaction. For mediation to be present, BIS-activation

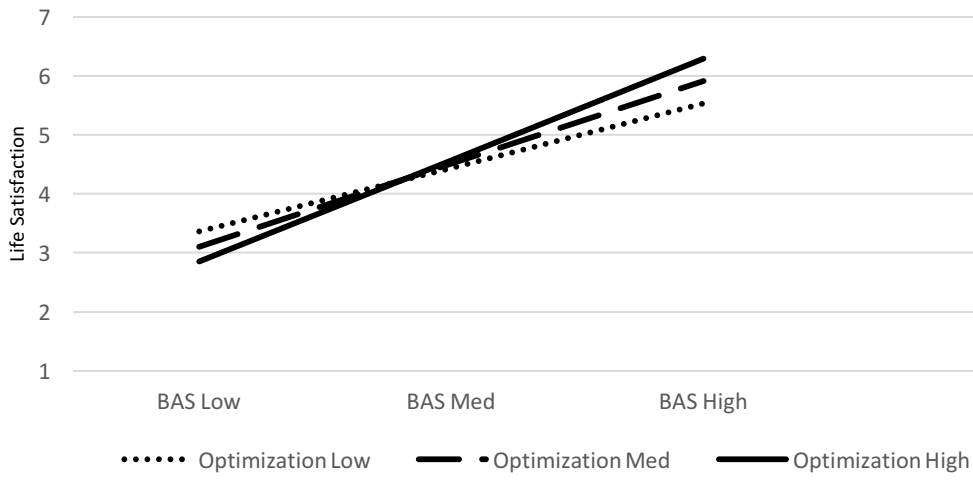
Table 18.

Hierarchical Regression of Life Satisfaction on Covariates, BAS-activation, and Optimization Strategies (H1e) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17**	.03*	.00	.01	-.02
2	Marital	-.03	.00	.04	.06	.03
3	Religious	.14*	.02*	.14*	.06	.09*
4	BAS	.85***	.68***	.17***	.01	.83***
5	Optimization	.38***	.00	.04	.08	.02
	(Constant)			-1.54	.84	

Note. Marital: Marital status; Religious: Religious activity BAS: BAS-activation.
Cumulative $R^2 = .73$; adjusted $R^2 = .72$.
*p<.05, **p<.01, ***p<.001.

Figure 17. Moderation Effect of Optimization Strategies on Relationship between BAS and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

had to predict life satisfaction significantly.

Simple correlation analysis showed that the relationship between BIS-activation and life satisfaction was statistically significant (r=-.83, p<.001, Table 19). That is, people who had higher BIS-activation reported lower life satisfaction.

In the regression analysis, BIS-activation significantly predicted life satisfaction after controlling for age, marital status, and religious activity (Table 19), R^2 = .65, $F(1, 203) = 434.28$, p<.001. That is, 65% of the variance in life satisfaction was explained by BIS-activation. Thus, the first condition for a mediation effect was met.

In the second hierarchical regression, BIS-activation was the independent variable and loss-based selection strategies were the dependent variable. For mediation to be present, BIS-activation had to significantly predict loss-based selection strategies.

Zero-order correlation analysis showed that there was a statistically significant

Table 19.

Hierarchical Regression of Life Satisfaction on Covariates and BIS-activation (H1f) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17*	.03*	-.01	.01	-.03
2	Marital	-.03	.00	.04	.06	.03
3	Religious	.14*	.02*	.17**	.06	.10**
4	BIS	-.83***	.65***	-1.66***	.08	-.82***
	(Constant)			8.40***	.75	

Note. Marital: Marital status; Religious: Religious activity; BIS: BIS-activation.
Cumulative R^2 = .70; adjusted R^2 = .69.
*p<.05, **p<.01, ***p<.001.

relationship between BIS-activation and loss-based selection strategies (r=.43, p<.001, Table 20). That is, older adults who had higher BIS-activation used more loss-based selection strategies in order to achieve their goals.

In this analysis, BIS-activation significantly predicted use of loss-based selection strategies after controlling for age, marital status, and religious activity (Table 20), R^2 = .16, F(1, 203) = 41.53, p<.01. That is, 16% of the variance in loss-based selection strategies was accounted for by BIS-activation. Thus, the second condition for a mediation effect was met.

In the third regression analysis, BIS-activation and loss-based strategies were the independent variables and life satisfaction was the dependent variable. In this analysis, a mediator was loss-based selection strategies.

The third requirement for mediation was the effect of BIS-activation had to not be statistically significant when loss-based selection strategies were included in the model. However, the effect of BIS-activation on life satisfaction was statistically significant when loss-based selection strategies were in the model in this analysis (B=-1.63, p<.001, Table 21), R^2 =

Table 20.

Hierarchical Regression of Loss-based Selection Strategies on Covariates and BIS-activation (H1f) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	.24***	.06***	.02*	.01	.15*
2	Marital	.14*	.00	.05	.05	.07
3	Religious	.05	.00	.07	.05	.08
4	BIS	.43***	.16***	.42***	.07	.41***
	(Constant)			.17	.61	

Note. Marital: Marital status; Religious: Religious activity; BIS: BIS-activation.
Cumulative R^2 = .23; adjusted R^2 = .21.
*p<.05, **p<.01, ***p<.001.

.65, $F(1, 203)=434.28$, p<.001. That is, 65% of the variance in life satisfaction was explained by BIS-activation. Thus, the third condition for mediation was not met.

The fourth requirement for mediation effect was loss-based selection strategies had to significantly predict life satisfaction after controlling for BIS-activation. In this analysis, loss-based selection strategies did not significantly predict life satisfaction after controlling for BIS-activation (B=-.06, *ns*, Table 21), R^2 = .00, $F(1, 202)=.46$, *ns*. Thus, the fourth condition for mediation was not met.

According to these three analyses, we could conclude that older adults who had higher BIS-activation used more loss-based strategies and reported lower life satisfaction. However, loss-based selection strategies did not mediate the relationship between BIS-activation and life satisfaction. Loss-based selection strategies did not predict life satisfaction when BIS-activation was in the model. Rather, BIS-activation directly influenced life satisfaction. Thus, hypothesis 1f (Loss-based selection) was only partially supported.

In order to supplement the test of mediation, moderation analysis was conducted. In this

Table 21.

Hierarchical Regression of Life Satisfaction on Covariates BIS-activation, and Loss-based Selection Strategies (H1f) (N=208)

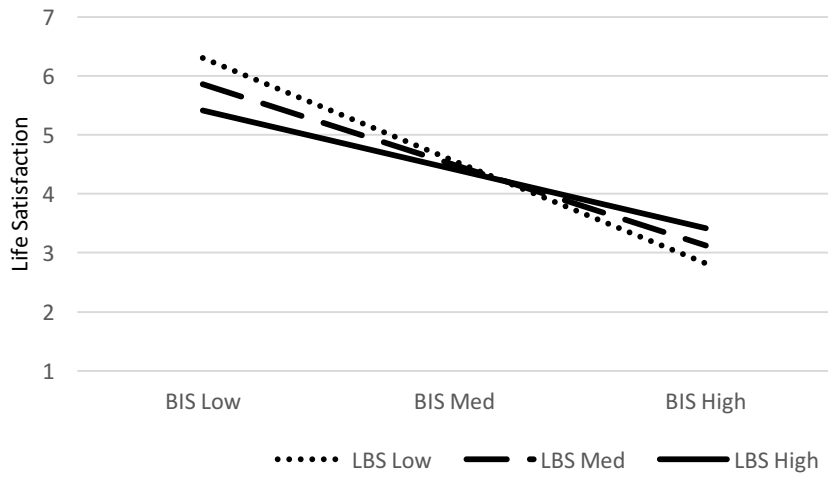
Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17*	.03*	.00	.01	-.02
2	Marital	-.03	.00	.05	.06	.03
3	Religious	.14*	.02*	.17**	.06	.11**
4	BIS	-.83***	.65***	-1.63***	.09	-.81***
5	Loss-based	-.38***	.00	-.06	.09	-.01
	(Constant)			8.41***	.75	

Note. Marital: Marital status; Religious: Religious activity; BIS: BIS-activation; Loss-based: Loss-based selection strategy.
Cumulative $R^2 = .70$; adjusted $R^2 = .69$.
*p<.05, **p<.01, ***p<.001.

analysis, the interaction term between BIS-activation and loss-based selection strategies significantly predicted life satisfaction, $R^2 = .04$, $F(1, 204)=31.81$, $p<.001$, B=.55, $p<.001$. Examination of the interaction plot showed that at lower levels of BIS-activation, older adults reported higher life satisfaction when they used loss-based selection strategies less. In contrast, at higher levels of BIS-activation older adults indicated higher life satisfaction when they used more loss-based strategies (Figure 18). Based on these analyses, we could conclude that there was a significant moderation effect of loss-based selection strategies on the relationship between BIS-activation and life satisfaction although there was no significant mediation effect by loss-based selection strategies.

Compensation. In the first hierarchical regression, the dependent variable was BIS-activation and the variable was life satisfaction. For mediation to be present, BIS-activation had to predict life satisfaction significantly. In the regression analysis, BIS-activation significantly

Figure 18. Moderation Effect of Loss-Based Selection Strategies on Relationship between BIS and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

predicted life satisfaction after controlling for age, marital status, and religious activity (Table 19), $R^2 = .65$, $F(1, 203) = 434.28$, $p<.001$. That is, 65% of the variance in life satisfaction was explained by BIS-activation. Thus, the first condition for a mediation effect was met.

In the second hierarchical regression, the independent variable was BIS-activation and the dependent variable was compensation strategies. For mediation, BIS-activation has to significantly predict compensation strategies.

Zero-order correlation analysis indicated that there was a statistically significant relationship between BIS-activation and compensation strategies ($r=.44$, $p<.001$, Table 22). That is, people who had higher BIS-activation focused on compensation strategies more in order to achieve their goals.

In this analysis, BIS-activation significantly predicted compensation strategies after controlling for age, marital status, and religious activity (Table 22), $R^2 = .16$, $F(1, 203) = 43.12$,

p<.001. That is, 16 % of the variance in compensation strategies was accounted for by BIS-activation. Thus, the second condition for a mediation effect was met.

In the third regression analysis, BIS-activation and compensation strategies were the independent variables and life satisfaction was the dependent variable. In this analysis, a potential mediator was compensation strategies.

The third requirement for mediation was the effect of BIS-activation had to not be statistically significant when compensation strategies were included in the model. However, the effect of BIS-activation on life satisfaction was statistically significant when compensation strategies were in the model in this analysis (B=-1.64, p<.001, Table 23), R^2 = .65, F(1, 203)=434.18, p<.001. That is, 65% of the variance in life satisfaction was explained by BIS-activation. Thus, the third condition for mediation was not satisfied.

Although the fourth requirement for mediation effect was compensation strategies had to significantly predict life satisfaction after controlling for BIS-activation, compensation strategies did not significantly predict life satisfaction (B=-.04, *ns*, Table 23), R^2 = .00, F(1, 202)=.16, *ns*. Thus, the fourth condition for mediation was not met.

According to these three analyses, we could conclude older adults who had higher levels of BIS-activation focused more on compensation strategies and reported lower life satisfaction. However, compensation strategies did not mediate the relationship between BIS-activation and life satisfaction. Rather, BIS-activation directly influenced life satisfaction. Thus, hypothesis 1f (Compensation) was partially supported.

In order to supplement the test of mediation, moderation analysis was conducted. In this analysis, the interaction term between BIS-activation and compensation strategies significantly predicted life satisfaction, R^2 = .04, F(1, 204)=26.15, p<.001, B=.53, p<.001.

Table 22.

Hierarchical Regression of Compensation Strategies on Covariates and BIS-activation (H1f) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	.25***	.06***	.02*	.01	.15*
2	Marital	.16*	.01	.06	.05	.09
3	Religious	.09	.01	.10	.05	.12
4	BIS	.44***	.16**	.41***	.06	.41***
	(Constant)			.15	.59	

Note. Marital: Marital status; Religious: Religious activity; BIS: BIS-activation.
Cumulative R^2 = .24; adjusted R^2 = .23.
*p<.05, **p<.01, ***p<.001.

Examination of the interaction plot showed that at lower levels of BIS-activation, older adults reported higher life satisfaction when they used compensation strategies less. In contrast, at higher levels of BIS-activation older adults were more satisfied with their life when they used more compensation strategies (Figure 19). Based on these analyses, we could conclude that there was a significant moderation effect of compensation strategies on the relationship between BIS-activation and life satisfaction although there was no significant mediation effect by compensation strategies.

Hypothesis 2a

Hypothesis 2a was that older adults who were in good health would focus more on knowledge acquisition goals and this would predict higher life satisfaction based on the mediation effect of knowledge acquisition goals on the relationship between health and life satisfaction after controlling for age, marital status, and religious activity.

In the first hierarchical regression, the independent variable was health and the dependent

variable was life satisfaction, for mediation to be present, health had to predict life satisfaction significantly.

In the regression analysis, health significantly predicted life satisfaction after controlling for age, marital status, and religious activity (Table 2, $R^2 = .19$, $F(1, 203) = 49.67$, $p<.001$. That is, 19% of the variance in life satisfaction was explained by health. Thus, the first condition for a mediation effect was met.

In the second hierarchical regression, health variable was the independent variable and knowledge acquisition goals were the dependent variable. For mediation to be present, health had to significantly predict knowledge acquisition goals. Simple correlation analysis showed that there was a statistically significant relationship between health and knowledge acquisition goals ($r=.32$, $p<.001$, Table 24). That is, people who had better health focused more on knowledge acquisition goals. In addition, there were significant relationships between knowledge

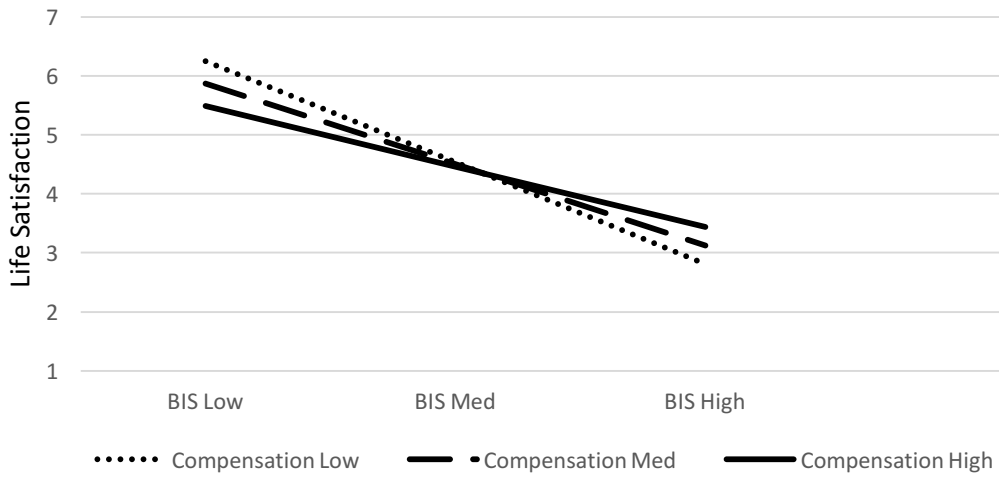
Table 23.

Hierarchical Regression of Life Satisfaction on Covariates, BIS-activation, and Compensation Strategies (H1f) (N=208)

Step	Variable	r	R^2 added	B	SE$_B$	Beta
1	Age	-.17*	.03*	-.01	.01	-.03
2	Marital	-.03	.00	.05	.06	.03
3	Religious	.14*	.02*	.17**	.07	.11**
4	BIS	-.83***	.65***	-1.64***	.09	-.81***
5	Compensation	-.36***	.00	-.04	.09	-.02
	(Constant)			8.41***	.75	

Note. Marital: Marital status; Religious: Religious activity; BIS: BIS-activation.
Cumulative $R^2 = .70$; adjusted $R^2 = .69$.
*$p<.05$, **$p<.01$, ***$p<.001$.

Figure 19. Moderation Effect of Compensation Strategies on Relationship between BIS and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

acquisition goals and age and marital status. Among these older adults, those who were younger and single were more likely to focus on knowledge acquisition goals. But there was no statistically significant relationship between knowledge acquisition goals and religious activity.

In this analysis, health significantly predicted knowledge acquisition goals after controlling for age, marital status, and religious activity (Table 24), $R^2 = .06$, $F(1, 203) = 13.11$, $p<.001$. That is, 6% of the variance in knowledge acquisition goals was accounted for by health. Thus, the second condition for a mediation effect was met.

In the third regression analysis, health and knowledge acquisition goals were the independent variables and life satisfaction was the dependent variable. In this analysis, knowledge acquisition goals were tested as a mediator.

Zero-order correlation analysis indicated that the relationship between knowledge acquisition goals and life satisfaction was statistically significant ($r=.16$, $p<.05$, Table 25).

Table 24.

Hierarchical Regression of Knowledge Acquisition Goals on Covariates and Health (H2a) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.20**	.04**	-.01	.01	-.04
2	Marital	-.17**	.01	-.09	.07	-.09
3	Religious	-.04	.00	-.04	.08	-.04
4	Health	.32***	.06***	.03***	.01	.28***
	(Constant)			-.17	1.21	

Note. Marital: Marital status; Religious: Religious activity.
Cumulative R^2 = .11; adjusted R^2 = .09.
*p<.05, **p<.01, ***p<.001.

People who focused more on knowledge acquisition goals were more satisfied with their life.

The third requirement for mediation was that the effect of health had to not be statistically significant when knowledge acquisition goals were included in the model. However, the effect of health on life satisfaction was statistically significant when knowledge acquisition goals were in the model in this analysis (B=.07, p<.001, Table 25), R^2 = .19, F(1, 203)=49.67, p<.001. That is, 19% of the variance in life satisfaction was explained by health. Thus, the third condition for mediation was not satisfied.

The fourth requirement for mediation effect was knowledge acquisition goals had to significantly predict life satisfaction after controlling for health. In this analysis, knowledge acquisition goals did not significantly predict life satisfaction after controlling for health (B=.05, *ns,* Table 25), R^2 = .00, F(1, 202)=.37, *ns*, when health was in the model.

According to these three analyses, we could conclude that older adults who had better health focused more on knowledge acquisition goals and reported higher life satisfaction.

However, knowledge acquisition goals did not mediate the relationship between health

Table 25.

Hierarchical Regression of Life Satisfaction on Covariates, Health, and Knowledge Acquisition Goals (H2a) (N=208)

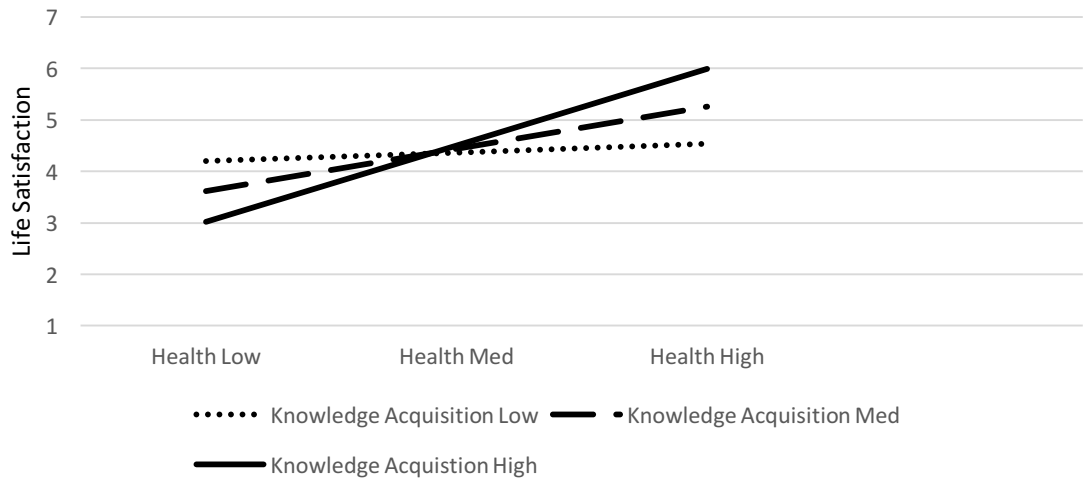
Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17*	.03*	.10	.02	.05
2	Marital	-.03	.00	.13	.09	.10
3	Religious	.14*	.02*	.27**	.10	.16**
4	Health	.45***	.19***	.07***	.01	.49***
5	Knowledge	.16*	.00	.05	.09	.04
	(Constant)			.41	1.52	

Note. Marital: Marital status; Religious: Religious Activity; Knowledge: Knowledge acquisition goals.
Cumulative R^2 = .24; adjusted R^2 = .22.
*p<.05, **p<.01, ***p<.001.

and life satisfaction. Rather, health directly influenced life satisfaction. Thus, hypothesis 2a was only partially met.

In order to supplement the test of mediation, moderation analysis was conducted. In this analysis, the interaction term between health and knowledge acquisition goals significantly predicted life satisfaction, R^2 = .17, F(1, 204)=52.99, p<.001, B=.05, p<.001. Examination of the interaction plot showed that at lower levels of health, older adults reported higher life satisfaction when they focused less knowledge acquisition goals. In contrast, at higher levels of health older adults were more satisfied with their life when they had more knowledge acquisition goals (Figure 20). Based on these analyses, we could conclude that there was a significant moderation effect of knowledge acquisition goals on the relationship between health and life satisfaction although there was no significant mediation effect by knowledge acquisition goals.

Figure 20. Moderation Effect of Knowledge Acquisition Goals on Relationship between Health and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

Hypothesis 2b

Hypothesis 2b was that older adults who have poorer health would focus more on emotion regulation goals and this will predict higher life satisfaction based on the mediation effect of emotion regulation goals on the relationship between health and life satisfaction after controlling for age, marital status, and religious activity.

In the first hierarchical regression, the independent variable was health and the dependent variable was life satisfaction. For mediation to be present, health had to significantly predict life satisfaction.

In the regression analysis, health significantly predicted life satisfaction after controlling for age, marital status, and religious activity (Table 2), $R^2 = .19$, $F(1, 203) = 49.67$, $p<.001$. That is, 19% of the variance in life satisfaction was explained by health. Thus, the first condition for a mediation effect was met.

In the second hierarchical regression, health was the independent variable and emotion regulation goals were the dependent variable. For mediation to be present, health had to predict emotion regulation goals significantly.

Zero-order correlation analysis indicated that there was a statistically significant relationship between health and emotion regulation goals (r=.30, p<.001, Table 26). That is, people who had higher levels of health had more emotion regulation goals. But there were no significant relationships between emotion regulation goals and age, marital status, or religious activities.

In this analysis, health significantly predicted emotion regulation goals after controlling for age, marital status, and religious activity (Table 26), R^2 = .08, $F(1, 203) = 18.23$, p<.001. However, in contrast to the assumption, older adults who had better health focused more on emotion regulation goals. Although 8% of the variance in emotion regulation goals was accounted for by health, the second condition for a mediation effect was not met.

In the third regression analysis, health and emotion regulation goals were the independent

Table 26.

Hierarchical Regression of Emotion Regulation Goals on Covariates and Health (H2b) (N=208)

Step	Variable	r	R^2 added	B	SE$_B$	Beta
1	Age	-.13	.02	.00	.01	-.01
2	Marital	.01	.00	.07	.05	.10
3	Religious	.00	.00	.01	.05	.02
4	Health	.30***	.08***	.02***	.01	.33***
	(Constant)			-.09	.79	

Note. Marital: Marital status; Religious: Religious Activity.
Cumulative R^2 = .10; adjusted R^2 = .08.
*p<.05, **p<.01, ***p<.001.

variables and life satisfaction was the dependent variable. In this analysis, a potential mediator was emotion regulation goals.

Simple correlation analysis showed that the relationship between emotion regulation goals and life satisfaction was statistically significant (r=.52, p<.001, Table 27). Older adults who more focused on emotion regulation goals reported higher life satisfaction.

The third requirement for mediation was the effect of health had to not be statistically significant when emotion regulation goals were included in the model. However, the effect of health on life satisfaction was statistically significant (B=.05, p<.001, Table 27), R^2 = .19, F(1, 203)=49.67, p<.001. That is, 19% of the variance in life satisfaction was explained by health. Thus, the third condition for mediation was not satisfied.

The fourth requirement for mediation was that emotion regulation goals had to significantly predict life satisfaction after controlling for health. Emotion regulation goals significantly predicted life satisfaction after controlling for health (B=.88, p<.001, Table 27), R^2

Table 27.

Hierarchical Regression of Life Satisfaction on Covariates, Health, and Emotion Regulation Goals (H2b) (N=208)

Step	Variable	r	R^2 added	B	SE_B	Beta
1	Age	-.17*	.03*	.01	.01	.05
2	Marital	-.03	.00	.07	.08	.05
3	Religious	.14*	.02*	.26**	.09	.16**
4	Health	.45***	.19***	.05***	.01	.36***
5	Emotion	.52***	.16***	.88***	.12	.42***
	(Constant)			.47	1.36	

Note. Marital: Marital status; Religious: Religious activity; Emotion: Emotion regulation goals. Cumulative R^2 = .39; adjusted R^2 = .37.
*p<.05, **p<.01, ***p<.001.

= .16, $F(1, 202)=52.16$, $p<.001$. That is, emotion regulation goals accounted for 16% of the variance in life satisfaction. Thus, the fourth condition for mediation was met.

According to these three analyses, we could conclude that older adults who had better health focused more on emotion regulation goals and this was the opposite of what was predicted. Emotion regulation goals significantly predicted life satisfaction. However, emotion regulation goals did not mediate the relationship between health and life satisfaction. Rather, health directly influenced life satisfaction. Thus, hypothesis 2b was only partially supported.

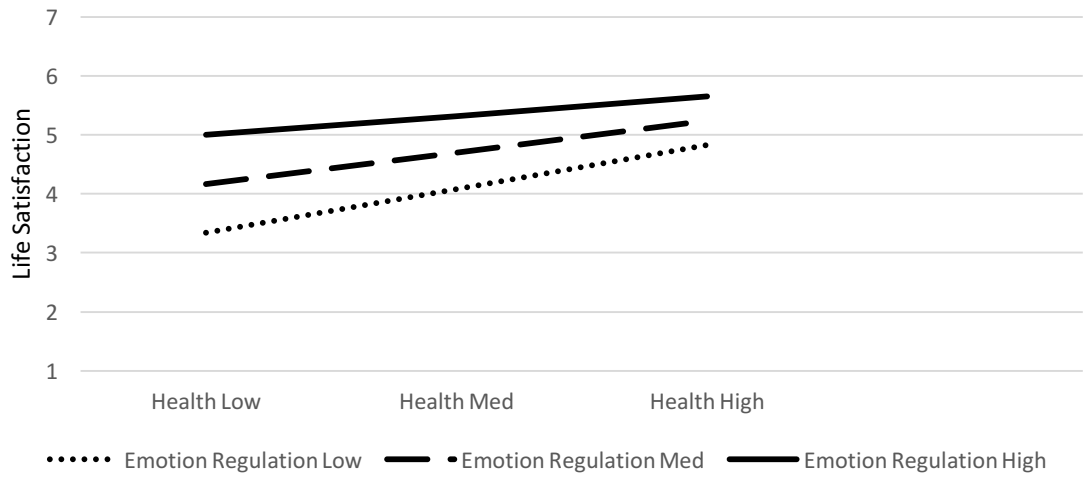
To supplement the test of mediation, moderation analysis was conducted. In this analysis, the interaction term between health and emotion regulation goals significantly predicted life satisfaction, $R^2 = .01$, $F(1, 204)=4.52$, $p<.05$, B=-.02, $p<.05$. Examination of the interaction plot showed that at every level of health, older adults reported higher life satisfaction when they focused more on emotion regulation goals. However, the differences in levels of life satisfaction between when they focused more and less on emotion regulation goals were bigger at poorer health (Figure 21). Based on these analyses, we can conclude that there was a significant moderation effect of emotion regulation goals on the relationship between health and life satisfaction although there was no significant mediation effect by emotion regulation goals.

Hypothesis 2c

Hypothesis 2c was that older adults who had higher levels of education would focus more on knowledge acquisition goals and this would predict higher life satisfaction based on the mediation effect of knowledge acquisition goals on the relationship between education level and life satisfaction after controlling for age, marital status, and religious activity.

In the first hierarchical regression, the independent variable was education level and the

Figure 21. Moderation Effect of Emotion Regulation Goals on Relationship between Health and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

dependent variable was life satisfaction. For mediation to be present, education level has to predict life satisfaction significantly.

In the regression analysis, education level significantly predicted life satisfaction after controlling for age, marital status, and religious activity (Table 9), $R^2 = .15$, $F(1, 203) = 36.74$, $p<.001$. That is, 15% of the variance in life satisfaction was explained by education levels. Thus, the first condition for a mediation effect was met.

In the second hierarchical regression, education level was the independent variable and knowledge acquisition goals were the dependent variable. For mediation to be present, education level had to predict knowledge acquisition goals significantly.

Zero-order correlation analysis showed that there was a statistically significant relationship between education levels and knowledge acquisition goals ($r=.40$, $p<.001$, Table 28). That is, older adults who had higher levels of education focused more on knowledge

acquisition goals.

Education level significantly predicted knowledge acquisition goals after controlling for age, marital status, and religious activity (Table 28), $R^2 = .12$, $F(1, 203) = 28.05$, $p<.01$. That is, 12% of the variance in knowledge acquisition goals was accounted for by education level. Thus, the second condition for a mediation effect was met.

In the third regression analysis, education level and knowledge acquisition goals were the independent variables and life satisfaction was the dependent variable. In this analysis, a potential mediator was knowledge acquisition goals.

Simple correlation analysis indicated that the relationship between knowledge acquisition goals and life satisfaction was statistically significant ($r=.16$, $p<.05$, Table 29). Older adults who focused more on knowledge acquisition goals were somewhat more satisfied with their life. The third requirement for mediation was the effect of education level had to not be statistically significant when knowledge acquisition goals were included in the model. However, the effect of education level on life satisfaction was still statistically significant (B=.34, $p<.001$,

Table 28.

Hierarchical Regression of Knowledge Acquisition Goals on Covariates and Education Level (H2c) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.20**	.04**	.00	.01	.00
2	Marital	-.17*	.01	-.11	.07	-.11
3	Religious	-.04	.00	-.03	.08	-.02
4	Education	.40***	.12***	.23***	.04	.38***
	(Constant)			-.63	1.10	

Note. Marital: Marital status; Religious: Religious activity; Education: Education level.
Cumulative $R^2 = .17$; adjusted $R^2 = .15$.
*$p<.05$, **$p<.01$, ***$p<.001$.

Table 29), $R^2 = .15$, $F(1, 203)=36.74$, $p<.001$. That is, 15% of the variance in life satisfaction was explained by education level. Thus, the third condition for mediation was not satisfied.

The fourth requirement for mediation effect was knowledge acquisition goals had to significantly predict life satisfaction after controlling for education level. In this analysis, knowledge acquisition goals did not significantly predict life satisfaction after controlling for education levels (B=.02, *ns*, Table 29), $R^2 = .00$, $F(1, 202)=.03$, *ns*. Thus, the fourth condition for mediation was not met.

According to these three analyses, we could conclude that older adults who had higher levels of education had more knowledge acquisition goals and reported higher life satisfaction. However, knowledge acquisition goals did not mediate the relationship between education level and life satisfaction. Rather, education level directly influenced life satisfaction. Thus, hypothesis 2c was partially supported.

Table 29.

Hierarchical Regression of Life Satisfaction on Covariates, Education Level, and Knowledge Acquisition goals (H2c) (N=208)

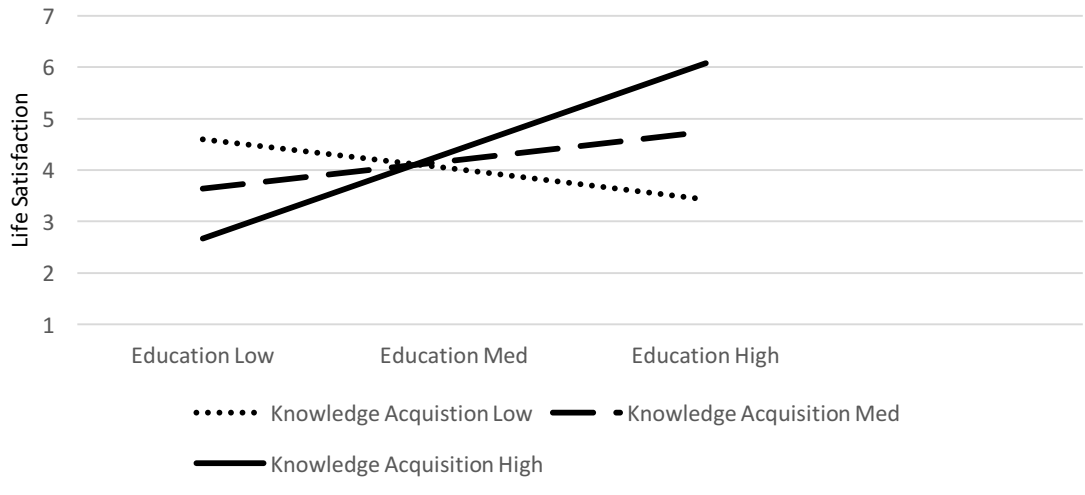
Step	Variable	r	R^2 added	B	SE$_B$	Beta
1	Age	-.17*	.03*	.00	.02	.00
2	Marital	-.03	.00	.08	.09	.05
3	Religious	.14*	.02	.28***	.11	.17**
4	Education	.40***	.15***	.34***	.06	.42***
5	Knowledge	.16*	.00	.02	.09	.01
	(Constant)			2.23	1.46	

Note. Marital: Marital status; Religious: Religious Activity; Education: Education level; Knowledge: Knowledge acquisition goals.
Cumulative $R^2 = .19$; adjusted $R^2 = .17$.
*$p<.05$, **$p<.01$, ***$p<.001$.

In order to supplement the test of mediation, moderation analysis was conducted. In this analysis, the interaction term between education level and knowledge acquisition goals significantly predicted life satisfaction, $R^2 = .42$, $F(1, 204)=201.33$, $p<.001$, B=.47, $p<.001$. Examination of the interaction plot showed that at lower levels of education, older adults reported higher life satisfaction when they focused on knowledge acquisition goals less. In contrast, at higher levels of education older adults were more satisfied with their life when they focused on more knowledge acquisition goals at higher levels of education level (Figure 22). Based on these analyses, we could conclude that there was a significant moderation effect of knowledge acquisition goals on the relationship between education level and life satisfaction although there was no significant mediation effect by knowledge acquisition goals.

Hypothesis 2d

Figure 22. Moderation Effect of Knowledge Acquisition Goals on Relationship between Education and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

Hypothesis 2d was that older adults who had lower levels of education would focus more on emotion regulation goals and this would predict higher life satisfaction based on the mediation effect of emotion regulation goals after controlling for age, marital, and religious activity.

In the first hierarchical regression, the independent variable was education level and the dependent variable was life satisfaction. For mediation to be present, education level had to predict life satisfaction significantly.

In the regression analysis, education level significantly predicted life satisfaction after controlling for age, marital status, and religious activity (Table 9), $R^2 = .15$, $F(1, 203) = 36.74$, $p<.001$. That is, 15% of the variance in life satisfaction was explained by education level. Thus, the first condition for a mediation effect was met.

In the second hierarchical regression, education level was the independent variable and emotion regulation goals was the dependent variable. For mediation to be present, education level has to significantly predict emotion regulation goals.

Simple correlation analysis showed that there was a statistically significant relationship between education level and emotion regulation goals ($r=.26$, $p<.001$, Table 30). That is, older adults who had higher levels of education focused more on emotion regulation goals.

In this analysis, education level significantly predicted emotion regulation goals after controlling for age, marital status, and religious activity (Table 30), $R^2 = .05$, $F(1, 203) = 11.54$, $p<.01$. That is, 5% of the variance in emotion regulation goals was accounted for by education level. Although emotion regulation goals significantly predicted emotion regulation goals, the direction of prediction was in opposite. The data in this study indicated that older adults who had

higher levels of education level focused on more emotion regulation goals. Thus, the second condition for a mediation effect was not met.

In the third regression analysis, education level and emotion regulation goals were the independent variables and life satisfaction was the dependent variable. In this analysis, a mediator was emotion regulation goals.

The third requirement for mediation was the effect of education level had to not be statistically significant when emotion regulation goals were included in the model. However, the effect of education levels on life satisfaction was still statistically significant (B=.25, $p<.001$, Table 31), $R^2 = .15$, $F(1, 203)=36.74$, $p<.001$. That is, 15% of the variance in life satisfaction was explained by education level. Thus, the third condition for mediation was not satisfied.

The fourth requirement for mediation effect was emotion regulation goals had to significantly predict life satisfaction after controlling for education level. In this analysis, emotion regulation goals significantly predicted life satisfaction after controlling for education

Table 30.

Hierarchical Regression of Emotion Regulation Goals on Covariates and Education Level (H2d) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.13	.02	-.01	.01	-.05
2	Marital	.01	.00	.05	.05	.08
3	Religious	.00	.00	.01	.05	.02
4	Education	.26***	.05**	.10**	.03	.25**
	(Constant)			.61	.75	

Note. Marital: Marital status; Religious: Religious activity; Education: Education level.
Cumulative $R^2 = .07$; adjusted $R^2 = .06$.
*$p<.05$, **$p<.01$, ***$p<.001$.

level (B=.93, $p<.001$, Table 31), $R^2 = .18$, $F(1, 202)=58.95$, $p<.001$. Emotion regulation goals accounted for 18% of the variance in life satisfaction. Thus, the fourth condition for mediation was met.

According to these three analyses, we could conclude that older adults who had higher levels of education were more satisfied with their life. However, older adults who had higher education levels focused more on emotion regulation goals and these results were the opposite of what was predicted. Thus, hypothesis 2d was partially supported.

In order to supplement the test of mediation, moderation analysis was conducted. In this analysis, the interaction term between education level and emotion regulation goals significantly predicted life satisfaction, $R^2 = .05$, $F(1, 204)= =16.42$, $p<.001$, B=-.25, $p<.001$. Examination of the interaction plot showed that at every level of education, older adults reported higher life satisfaction when they focused more on emotion regulation goals (Figure 23). However, the

Table 31.

Hierarchical Regression of Life Satisfaction on Covariates, Education Level, and Emotion Regulation Goals (H2d) (N=208)

Step	Variable	r	R^2 added	B	SE$_B$	Beta
1	Age	-.17*	.03*	.01	.01	.02
2	Marital	-.03	.00	.03	.08	.02
3	Religious	.14*	.02*	.27**	.09	.16**
4	Education	.40***	.15***	.25***	.05	.31***
5	Emotion	.52***	.18***	.93***	.12	.44***
	(Constant)			1.65	1.29	

Note. Marital: Marital status; Religious: Religious activity; Education: Education Level; Emotion: Emotion regulation goals.
Cumulative $R^2 = .38$; adjusted $R^2 = .36$.
*$p<.05$, **$p<.01$, ***$p<.001$.

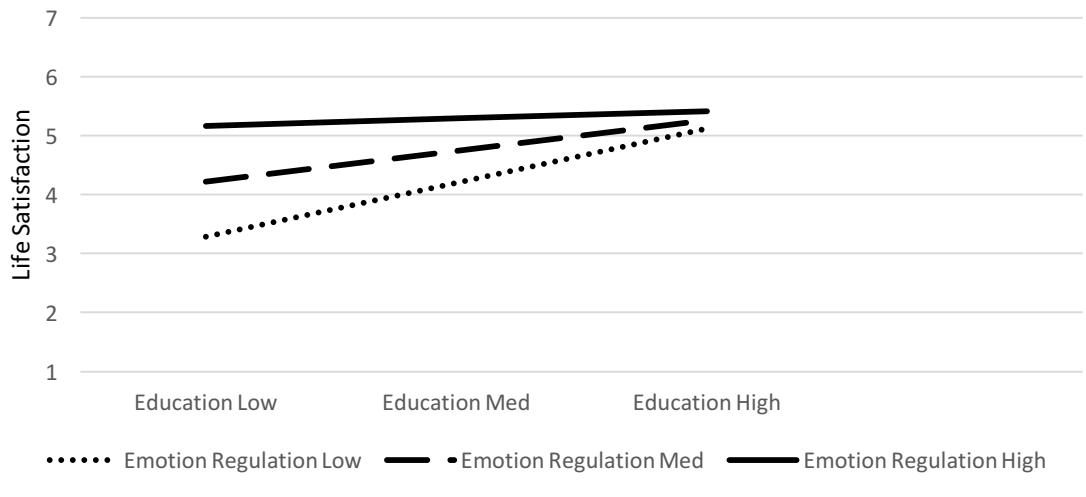
difference in levels of life satisfaction between when they focused more and less on emotion regulation goals were bigger at lower levels of education. Based on these analyses, we could conclude that there was a significant moderation effect of emotion regulation goals on the relationship between education level and life satisfaction although there was no significant mediation effect by emotion regulation goals.

Hypothesis 2e

Hypothesis 2e was that older adults who had higher BAS-activation would focus more on knowledge acquisition goals and this would predict higher life satisfaction after controlling for age, marital status, and religious activity based on mediation effect by knowledge acquisition goals.

In the first hierarchical regression, the independent variable was BAS-activation and the

Figure 23. Moderation Effect of Emotion Regulation Goals on Relationship between Education and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

dependent variable was life satisfaction. For mediation to be present, BAS-activation had to predict life satisfaction significantly. Simple correlation analysis showed that the relationship between BAS-activation and life satisfaction was statistically significant (r=.85, p<.001, Table 16). That is, people who had higher levels of BAS-activation reported higher life satisfaction.

In the regression analysis, BAS-activation significantly predicted life satisfaction after controlling for age, marital status, and religious activity (Table 16), R^2 = .68, $F(1, 203) = 513.58$, p<.001. That is, 68% of the variance in life satisfaction was explained by BAS-activation. Thus, the first condition for a mediation effect was met.

In the second hierarchical regression, BAS-activation was the independent variable and knowledge acquisition goals were the dependent variable. For mediation to be present, BAS-activation had to predict knowledge acquisition goals significantly.

Zero-order correlation analysis showed that there was a statistically significant relationship between behavioral activation system and knowledge acquisition goals (r=.21, p<.01, Table 32). That is, people who had higher BAS activation focused more on knowledge acquisition goals.

In this analysis, BAS-activation significantly predicted knowledge acquisition goals after controlling for age, marital status, and religious activity (Table 32), R^2 = .03, $F(1, 203) = 7.06$, p<.01. That is, 3% of the variance in knowledge acquisition goals was accounted for by BAS-activation. Thus, the second condition for a mediation effect was met.

In the third regression analysis, BAS-activation and knowledge acquisition goals were the independent variables and life satisfaction was the dependent variable. In this analysis, knowledge acquisition goals were tested as a mediator.

The third requirement for mediation was the effect of BAS-activation had to not be

statistically significant when knowledge acquisition goals were included in the model. However, the effect of BAS-activation on life satisfaction was statistically significant (B=.18, $p<.001$, Table 33), $R^2 = .68$, $F(1, 203)=513.58$, $p<.001$). That is, 68% of the variance in life satisfaction was explained by BAS-activation. Thus, the third condition for mediation was not satisfied.

The fourth requirement for mediation effect was knowledge acquisition goals had to significantly predict life satisfaction after controlling for BAS-activation. In this analysis, knowledge acquisition goals did not predict life satisfaction after controlling for BAS-activation (B=-.01, *ns*, Table 33), $R^2 = .00$, $F(1, 202)=.06$, *ns*. Thus, the fourth condition for mediation was not met.

According to these three analyses, we could conclude that older adults who had higher BAS- activation focused more on knowledge acquisition goals and indicated higher life satisfaction. However, knowledge acquisition goals did not mediate the relationship between BAS-activation and life satisfaction. Rather, BAS-activation directly influenced life satisfaction. Thus, hypothesis 2e was partially supported.

Table 32.

Hierarchical Regression of Knowledge Acquisition Goals on Covariates and BAS-activation (H2e) (N=208)

Step	Variable	r	R^2 added	B	SE_B	Beta
1	Age	-.20**	.04**	-.02	.01	-.12
2	Marital	-.17*	.01	-.13	.07	-.12
3	Religious	-.04	.00	-.08	.08	-.06
4	BAS	.21**	.03**	.03**	.01	.18**
	(Constant)			1.21	1.09	

Note. Marital: Marital status; Religious: Religious activity; BAS: BAS-activation.
Cumulative $R^2 = .09$; adjusted $R^2 = .07$.
*$p<.05$, **$p<.01$, ***$p<.001$.

In order to supplement the test of mediation, moderation analysis was conducted. In this analysis, the interaction term between BAS-activation and knowledge acquisition goals significantly predicted life satisfaction, $R^2 = .02$, $F(1, 204)=17.00$, $p<.001$, B=.03, $p<.001$. Examination of the interaction plot showed that at lower levels of BAS-activation, older adults reported higher life satisfaction when they focused on less knowledge acquisition goals. In contrast, at higher levels of BAS-activation older adults were more satisfied with their life when they focused on more knowledge acquisition goals (Figure 24). Based on these analyses, we can conclude that there was a significant moderation effect of knowledge acquisition goals on the relationship between BAS-activation and life satisfaction although there was no significant mediation effect of knowledge acquisition goals.

Hypothesis 2f

Hypothesis 2f was that older adults who had higher BIS-activation would focus more on emotion regulation goals and this would predict higher life satisfaction after controlling for age, marital, and religious activity based on the mediation effect of emotion regulation goals.

In the first hierarchical regression, the independent variable was BIS-activation and the dependent variable was life satisfaction. For mediation to be present, BIS-activation had to predict life satisfaction significantly.

In the regression analysis, BIS-activation significantly predicted life satisfaction after controlling for age, marital status, and religious activity (Table 19), $R^2 = .65$, $F(1, 203) = 434.28$, $p<.001$. That is, 65% of the variance in life satisfaction was explained by BIS-activation. Thus, the first condition for a mediation effect was met.

In the second hierarchical regression, BIS-activation was the independent variable and

Table 33.

Hierarchical Regression of Life Satisfaction on Covariates, BAS-activation, and Knowledge Acquisition Goals (H2e) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17*	.03*	-.01	.01	-.02
2	Marital	-.03	.00	.03	.06	.02
3	Religious	.14*	.02*	.14*	.06	.08*
4	BAS	.85***	.68***	.18***	.01	.84***
5	Knowledge	.16*	.00	-.01	.05	-.01
	(Constant)			-1.40	.80	

Note. Marital: Marital status; Religious: Religious Activity; BAS: BAS-activation systems; Knowledge: Knowledge acquisition goals.
Cumulative R^2 = .73; adjusted R^2 = .72.
*p<.05, **p<.01, ***p<.001.

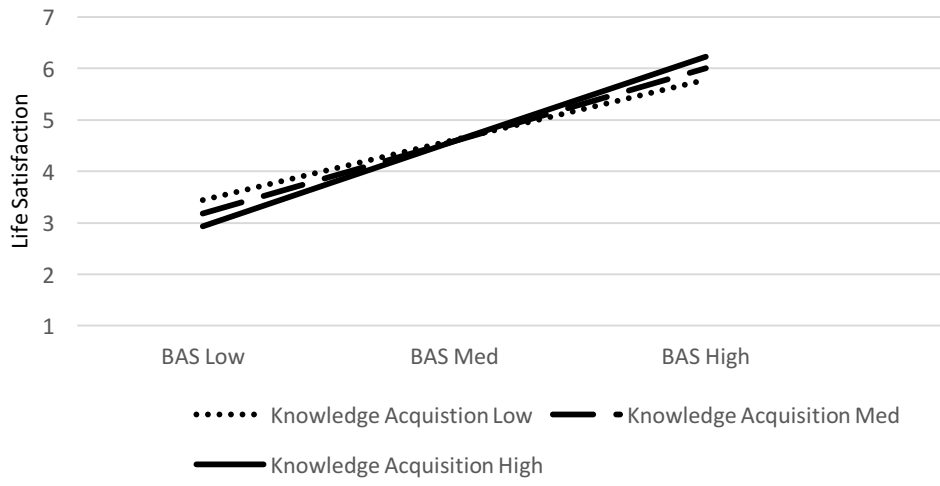
emotion regulation goals were the dependent variable. For mediation to be present, BIS-activation had to significantly predict emotion regulation goals.

Simple correlation analysis showed that there was a statistically significant relationship between BIS-activation and emotion regulation goals (r=-.45, p<.001, Table 34). That is, older adults who had higher BIS-activation focused less on emotion regulation goals. Although there was a significant relationship between BIS-activation and emotion regulation goals, the direction was the opposite of what was predicted.

In this analysis, BIS-activation significantly predicted emotion regulation goals after controlling for age, marital status, and religious activity (Table 34), R^2 = .19, $F(1, 203) = 48.47$, p<.001. 19 % of the variance in emotion regulation goals was accounted for by BIS-activation. Thus, the second condition for a mediation effect was not met.

In the third regression analysis, BIS-activation and emotion regulation goals were the

Figure 24. Moderation Effect of Knowledge Acquisition Goals on Relationship between BAS and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

independent variables and life satisfaction was the dependent variable. In this analysis, a mediator was emotion regulation goals.

The third requirement for mediation was the effects of BIS-activation had to not be statistically significant when emotion regulation goals were included in the model. However, the effect of BIS-activation on life satisfaction was statistically significant (B=-1.49, p<.001, Table 35), R^2 = .65, F(1, 203)=434.28, p<.001. That is, 65% of the variance in life satisfaction was explained by BIS. Thus, the third condition for mediation was not satisfied.

The fourth requirement for mediation effect was emotion regulation goals had to significantly predict life satisfaction after controlling for BIS-activation. In this analysis, emotion regulation goals significantly predicted life satisfaction after controlling for BIS-activation (B=.39, p<.001, Table 35),R^2 = .03, F(1, 202)=20.47, p<.001, after controlling for BIS-activation. Thus, the fourth condition for mediation was met.

Table 34.

Hierarchical Regression of Emotion Regulation Goals on Covariates and BIS-activation (H2f) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.13	.02	-.01	.01	-.08
2	Marital	.01	.00	.04	.04	.06
3	Religious	.00	.00	-.02	.05	-.02
4	BIS	-.45***	.19***	-.43***	.06	-.44***
	(Constant)			2.34***	.58	

Note. Marital: Marital status; Religious: Religious Activity; BIS: BIS-activation.
Cumulative R^2 = .19; adjusted R^2 = .19.
*p<.05, **p<.01, ***p<.001.

According to these three analyses, we could conclude that older adults who had higher BIS -activation focused less on emotion regulation goals although this study assumed that they would have more emotion regulation goals. However, older adults who had higher levels of BIS-activation reported lower life satisfaction. Older adults who focused more on emotion regulation goals reported higher life satisfaction. Thus, hypothesis 2f was partially supported.

To supplement the test of mediation, moderation analysis was conducted. In this analysis, the interaction term between BIS-activation and emotion regulation goals did not significantly predict life satisfaction, R^2 = .00, $F(1, 204)$=1.58, p=.211, B=.14, p=.211. Examination of the interaction plot showed that at every level of BIS-activation, older adults reported higher life satisfaction when they focused on more emotion regulation goals (Figure 25). Based on these analyses, we could conclude that there was not a significant moderation effect of emotion regulation goals on the relationship between BIS-activation and life satisfaction. In addition, there was no significant mediation effect of emotion regulation goals.

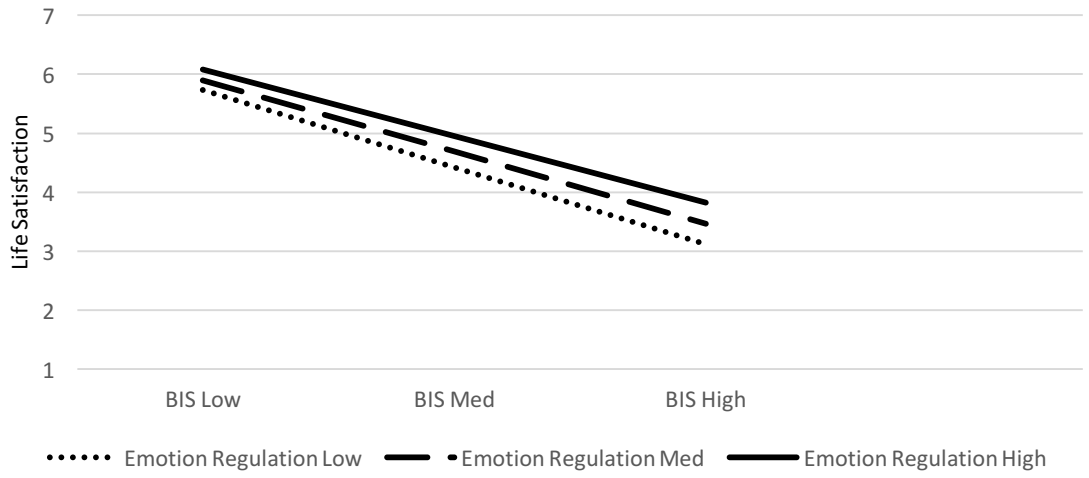
Table 35.

Hierarchical Regression of Life Satisfaction on Covariates, BIS-activation, and Emotion Regulation Goals (H2f) (N=208)

Step	Variable	r	R^2 added	B	SEB	Beta
1	Age	-.17*	.03*	.00	.01	-.02
2	Marital	-.03	.00	.03	.06	.02
3	Religious	.14*	.02*	.18**	.06	.11**
4	BIS	-.83***	.65***	-1.49***	.09	-.74***
5	Emotion	.52***	.03***	.39***	.09	.19***
	(Constant)			7.48***	.74	

Note. Marital: Marital status; Religious: Religious activity; BIS: BIS activation; Emotion: Emotion regulation goals.
Cumulative R^2 = .73; adjusted R^2 = .72.
*p<.05, **p<.01, ***p<.001.

Figure 25. Moderation Effect of Emotion Regulation Goals on Relationship between BIS and Life Satisfaction



Note. Low: 1 SD below the mean; Med: at the mean; High: 1 SD above the mean

Chapter V. Discussion

There were two main objectives in this study. The first was to investigate the relationships between individual factors, different goal achievement strategies, and life satisfaction based on Selection, Optimization, and Compensation theory (SOC). Individual factors included health, education level, and neuropsychological systems in personality, BIS-activation and BAS-activation. In this current study, loss-based selection, optimization, and compensation strategies were the goal achievement strategies measured. Results suggested that there were relationships between individual factors, goal achievement strategies, and life satisfaction. When older adults who had better health, higher education, and higher BAS-activation used more optimization strategies and less loss-based selection and compensation strategies, they had higher life satisfaction. On the contrary to this, older adults who had poorer health, lower education, and higher BIS-activation had higher life satisfaction when they used less optimization and more loss-based selection and compensation.

The second objective was to examine the relationships between individual factors, different social goals, and life satisfaction based on socioemotional selectivity theory (SST). Individual differences included health, education level, and neuropsychological systems in personality, BIS-activation and BAS-activation. Social goals included knowledge acquisition goals and emotion regulation goals. Results suggested that there were relaionships between individual factors, social goals, and life satisfaction. When older adults who had better health, higher education, and higher BAS-activation focused more on knowledge acquisition goals, they had higher life satisfaction. In contrast, older adults who had poorer health and lower education had higher life satisfaction when they focused more on emotion regulation goals.

Although there were no significant mediation effects of different SOC strategies and

different social goals, SOC strategies and types of social goals in SST statistically predicted life satisfaction during older adulthood. And these findings were consistent with previous studies. Based on other past studies, however, the usage of different SOC strategies for goal achievement and different social goals might function as buffers, protective factors, and enhancing factors (Ballow et al., 2012; Dumitrache et al., 2017; Wang et al., 2016). For example, in a previous study spirituality moderated the relationship between chronic illness and markers of psychological well-being (Ballow et al., 2012). These researchers explained that spirituality worked as a buffer reducing negative effects of chronic illness on psychological well-being. In the same way, the usage of SOC strategies and different social goals could work as buffering, protective, and enhancive factors for maintaining life satisfaction depending on different levels on individual factors. Based on this rationale, moderation effects of different goal achievement strategies and different goal types were tested.

There were five major findings from the tests of moderation effects. First, optimization strategies significantly moderated the relationships of health, education level, and BAS-activation to life satisfaction. Second and third, loss-based selection and compensation strategies significantly moderated the relationship of health, education level, and BIS-activation to life satisfaction. Fourth, knowledge acquisition goals significantly moderated the relationships of health, education level, and BAS-activation to life satisfaction. Finally, emotion regulation goals were a significant moderator of the relationships of health and education level to life satisfaction. There was no significant moderation effect of emotion regulation goals on the relationship between BIS-activation and life satisfaction. That is, the data did not suggest that emotion regulation goals worked as buffers or protective factors for maintaining or improving life satisfaction when people had higher BIS-activation. This result was consistent with previous

studies that showed BIS was strongly related to neuroticism, anxiety, depression, and negative affect (Gable et al., 2000; Johnson et al., 2003, & Jorm et al., 1999).

In some cases in this study, classic crossover interactions were observed. For example, the goal strategies or types that were associated with the highest life satisfaction for the most educated individuals in contrast were associated with the lowest life satisfaction for the least educated. These findings made clear that one-size-fits-all approaches were not consistent with optimizing the relationship between the way that older adults pursued their goals and how satisfied they felt with their lives. The important patterns of moderation effects were discussed more in the section below on moderation effects of different goal achievement strategies and goal types.

Selection, optimization, and compensation (SOC) and life satisfaction

Reidiger, Li, and Lindenberger (2006) concluded that the SOC strategies were positively related to successful aging. Although use of SOC strategies helped improve well-being, each strategy (optimization, loss-based selection, and compensation) might have different effects on well-being in different situations (Baltes & Heydens-Gahir, 2003; Freund & Baltes, 1998). The current study also showed different relationships of each strategy to life satisfaction based on individual factors (health, education level, and neuropsychological systems in personality, BIS-activation and BAS-activation). First, older adults reported higher life satisfaction as they used more optimization strategies when they had higher health, education level, and BAS-activation. In contrast, older adults reported higher life satisfaction as they used less optimization strategies when they had lower levels of health, education, or BAS-activation.

Second, older adults reported higher life satisfaction as they used more loss-based selection strategies when they had lower health, lower education level, or higher BIS-activation.

In contrast, older adults reported higher life satisfaction as they used loss-based selection strategies less when they had higher health, education levels, or BAS-activation. It can be concluded that loss-based selection strategies might work as a protective factor for having higher life satisfaction and achieving goals specifically for older adults with lower levels of health or education, or higher BIS-activation.

Third, older adults reported higher life satisfaction as they used more compensation strategies when they had lower levels of health and education, or had higher BIS-activation. In contrast, older adults reported higher life satisfaction as they used compensation strategies less when they had higher health, education, or BAS-activation. Compensation strategies might work as a protective factor to have higher life satisfaction and to achieve goals for older adults with poorer health, lower levels of education, or higher BIS-activation.

These results showed when older adults can have higher life satisfaction although they experience declines in health or have limited education or a disposition toward avoidance motivation (BIS-activation). Freund (1998) explained that older adults can maintain or improve their well-being although they have experienced declines in resources because SOC strategies could assist older adults in using resources effectively. In the current study, the findings were consistent with the idea that older adults might have higher life satisfaction using loss-based selection and compensation strategies as a method to regulate their declines in health, challenges related to education and personality, other age-related losses such as energy, strength, cognitive capacities, sensory acuity, and so on. That is, it can be concluded that loss and challenge regulation are important factors in individuals' ability to have higher life satisfaction (Rothermund & Brandstadter, 1998; Wrosch, Heckhausen, & Lachman, 2000). In addition, other researchers concluded that optimization is an important strategy to maintain or to improve life

satisfaction when resources decline (Jopp & Smith, 2006). For that reason, these researchers concluded that aiming to grow was also important for having psychological health when people experienced resource-related loss or challenges.

These results also raise the possibility that older adults may acknowledge they have experienced age-related declines in their physical resources and have had disadvantages in their education and personality. Because of this possibility, it may be that older adults reduce their optimism about the probability of achieving their goals and may change their strategies in order to maintain their current resource level or avoid more losses (Heckhausen, 1997). Older adults could have higher life satisfaction by acknowledging limitations in growth and increased possibilities for declines rather than trying to maintain the same perceived personal control levels (Schulz & Heckhausen, 1996). If older adults do not have enough resources to pursue their goals, keeping the same goal strategies does not help them achieve their original goals. And this may influence their life satisfaction negatively.

Knowledge acquisition goals, emotion regulation goals, and life satisfaction

Socioemotional selectivity theory proposes that when individuals face declines and resource limitations, goal adjustment is an important factor for psychological health (Rasmussen, Wrosch, Scheier, & Carver, 2006; Wrosch, Bauer, & Scheier, 2005). In the current study, regardless of level of health, education, and neuropsychological system in personality, older adults reported higher life satisfaction as they focused on more emotion regulation goals. These results were consistent with SST (Carstensen, 1992). According to SST, aging individuals try to focus on positive emotions, and goals that can help control their negative emotions and stresses. Through these means, older adults who may have limited future time perspective and are experiencing resource challenges may maintain their life satisfaction.

On the other hand, there was not a consistent pattern for knowledge acquisition goals. Older adults reported higher life satisfaction as they focused less on knowledge acquisition goals if they had lower levels of health, education, or BAS activation, which was consistent with SST. In contrast, older adults reported higher life satisfaction if they focused *more* on knowledge acquisition goals when they had higher levels of health, education, or BAS activation. Because of the different patterns of moderation effects for knowledge acquisition goals and emotion regulation goals, it can be suggested that the mechanisms underlying SST vary depending on individual differences. This is discussed further in the next section.

Moderation effects of different goal achievement strategies and goal types

In this study, there were significant crossover moderation effects of usage of optimization, loss-based selection, and compensation on the relationships of health and education to life satisfaction. The moderation patterns of the relationships of health and education with life satisfaction were very similar. These results indicated that older adults can have higher levels of life satisfaction using appropriate goal achievement strategies even though they have limitations in their resources. These results were consistent with previous studies that showed the goal achievement strategies, selection, optimization, and compensation, were important factors for successful aging (Baltes & Carstensen, 1996; Freund & Baltes, 1998). In addition, according to previous research (Dumitrache et al., 2017; Meeks & Murrell, 2001), health and education levels were significantly related to life satisfaction during older adulthood. While these previous studies showed significant effects of goal achievement strategies, health, and education levels on life satisfaction separately, this study found that usage of goal strategies moderated the relationship of health and education to life satisfaction. Even though poorer health and lower educational attainment are associated with lower life satisfaction, older adults can lead a more rewarding life

by using appropriate goal achievement strategies; that is, fit between a person's resources and the strategies they use was associated with higher life satisfaction in this study. Furthermore, this study found that the patterns of moderation effects were very similar for health and education level; for a person with poorer health and/or lower educational attainment, high use of compensation and loss-based selection strategies and low use of optimization strategies were associated with higher life satisfaction. And the opposite was true of people with better health or higher levels of education. These results have implications for future research. To understand the moderation effects of using goal achievement strategies on the relationships of individual factors to life satisfaction, it will be informative to study additional individual factors such as income, extraverted/introverted personality, and so on. In addition, the present results have implications for senior centers and practitioners who work with older adults, who can use these results in their programs. For example, programs serving the frail elderly can provide opportunities so that adults can use loss-based selection or compensation strategies to maintain or improve life satisfaction. They can help these older adults learn how to achieve their important goals by focusing on their priorities and switching goal hierarchies. In addition, they can provide information about community or outside resources that might help these older adults to achieve their goals.

There were significant moderation effects of different goal types, knowledge acquisition goals and emotion regulation goals, on the relationship of health to life satisfaction, and education to life satisfaction. For each goal type, there were similar patterns of moderation effects on the relationship to life satisfaction for health and education. However, the patterns for knowledge acquisition goals and emotion regulation goals were different.

For knowledge acquisition goals, there were significant crossover moderation effects. For

a person with better health and/or higher educational attainment, more focus on knowledge acquisition goals was associated with higher life satisfaction. In comparison, for a person with poorer health and/or lower educational attainment, more focus on knowledge acquisition goals was not associated with higher life satisfaction. However, more focus on emotion regulation goals was associated with higher life satisfaction for everyone regardless of health or education level. Because the patterns of moderation effects of knowledge acquisition goals and emotion regulation goals were different, it can be suggested that the mechanisms underlying SST vary depending on individual differences. According to SST, older adults *shift* from knowledge acquisition goals to emotion regulation goals when future time perspective shrinks and doing so is positively related to life satisfaction. This study's results suggest that this may not always hold. And it is not only that people who pursued higher education earlier in life keep pursuing knowledge acquisition later in life, because the crossover pattern also holds for older adults with better health. However, the present study also suggests that the pattern is not true of all personal resources, because BAS did not show this crossover pattern; more knowledge acquisition goals were not associated with higher life satisfaction for people with higher approach motivation. Future research should examine other personal resources such as income, extraverted/introverted personality, energy, strength, and so on to clarify which ones are associated with this apparent qualification of SST and which ones are not. In addition, to better understand the mechanism underlying this pattern of results, future research should investigate different possible mediators. Do higher health and higher education buffer against the perception that advancing age is shortening one's time left to live, enabling people to maintain knowledge acquisition goals that "pay off" only in the future? If so, the moderation effects found in the present study in fact would be compatible with SST because a shifting future time perspective is viewed as the mechanism

leading to goal change in SST.

In contrast to knowledge acquistions goals, there were no crossover moderation effects for emotion regulation goals. Older adults reported higher life satisfaction when they focused more on emotion regulation goals regardless of their health or education level. These results are consistent with socioemotional selectivity theory (SST; Carstensen, 1992). SST posits that people typically start to perceive their time as limited with age; as they do, they become increasingly selective, investing greater resources in emotionally meaningful goals and activities. Based on focusing more on emotion regulation goals, older adults can have higher life satisfaction although various personal resources decline during the aging process or they may already have limited personal resources. In this study, because the mean age of participants was 81 years old, it is reasonable to think that they may already have a limited time perception about their life and focus more on emotion regulation goals. However, based on the moderation effects of knowledge acquisition goals, there is a possibility that better health and higher educational attainment can buffer limited time perception. According to these results, it can be hypothesized that older adults can have both these goals and focus on one goal type based on situation rather than switching from one type of goal to the other with age. To examine this possible explanation, future study should investigate relationships among future time perspective, various possible moderators, the two different goal types, and life satisfaction. In addition, these results can be used in real situations for maintaining or improving life satisfaction. For example, senior centers can have programs for small activity groups that can increase interactions among older adults and provide opportunities for supporting and/or sharing emotions.

There were statistically significant but small moderation effects of different goal strategies and knowledge acquisition goals on the relationships of BIS and BAS with life

satisfaction. However, it is the main effects of BIS and BAS on life satisfaction that were most salient in this study. That is, older adults who had higher BAS and lower BIS always reported higher life satisfaction even though the goal strategies and knowledge acquisition goals moderated the relationships of BIS and BAS with life satisfaction. In addition, there was no moderation effect of emotion regulation goals on the relationship between BIS and life satisfaction. These strong main effects of BAS and BIS were consistent with the previous studies that showed there were positive relationships between BAS and healthy personality development and positive relationships between BIS and pathological functioning (Gray, 1990; Carver, 2004; Alloy & Abramson, 2010). Researchers in these previous studies interpreted these relationships based on brain function. Although the biopsychological theory of personality (Gray, 1990) was constructed based on the arguments that BIS and BAS personality are related to our emotions and life satisfaction, most researchers have focused on the relationships among BIS, BAS, and psychological disorder. Because the roles of BIS and BAS are important for life satisfaction in later life based on this current study, more research is needed to investigate how BIS and BAS are related to older adults' life satisfaction and how we can help people maintain or improve their life satisfaction with age, taking into account their BIS and BAS levels.

Interindividual variability of aging

According to Baltes and Baltes (1990), aging cannot be understood as a general and uniform process. These researchers proposed two reasons to explain why aging processes have to be understood from the perspective of interindividual variability. First, biological and environmental factors are different for every individual. In addition, differences in these two factors and interactions between these two factors accumulate with age (Plomin & Thompson, 1986). That is, older adults have individual differences in psychological phenomena such as

behaviors, emotions, and self-concepts that grow larger as they age. Second, these accumulated differences in psychological phenomena strongly affect how individuals perceive and interpret their lives (Brandstadter, 1984). Individuals have different levels of health, cognitive ability, and motivational personality based on biological factors. In addition, each individual has different experiences depending on their family, friends, community, and so on. According to these various experiences, differences in their health, education, and motivational personality increase. These increased differences in individual factors can influence people's life satisfaction because people differently perceive and interpret their lives. Thus, it is necessary to study the effects of interindividual variability on life satisfaction.

The current study supported the impact of interindividual variability on aging and development. This study showed that older adults' life satisfaction was related to the use of different strategies for achieving goals and focusing on different types of goals depending on health status, education level, and neuropsychological systems in personality (BIS-activation and BAS-activation). And related to these different goal achievement strategies and goal types, older adults had different levels of life satisfaction. Because of the interindividual variability in aging and development, it is not possible to use just one explanation for every individual's aging and development. Instead, each theory has to consider various individual factors including health, education level, personality, and so on and propose explanations that take into account individual differences.

Individual differences that were created throughout life have to be studied to understand how older adults select their goal pursuit strategies and adjust their goal types, and how older adults can maintain or improve their life satisfaction when resources decline or become limited.

Limitations

There were some limitations of this study. First, the study used a cross-sectional design to investigate how older adults may maintain or improve life satisfaction by selecting different goal achievement strategies and switching social goals when they start to experience declines in their resources or have already experienced losses. This study found significant moderation effects of these goal achievement strategies (i.e., selection, optimization, and compensation), and different goal types (i.e., knowledge acquisition and emotion regulation goals) on the relationships between individual factors and life satisfaction. However, longitudinal research is needed in order to learn how each individual can adjust to his/her life when the individual experiences limitations and changes in resources. A longitudinal study can provide a more complete picture regarding how people might maintain or improve life satisfaction through selecting different goal pursuit strategies and shifting goal types in order to adjust to limitations and changes in their resources.

Second, this study used self-report measurements, which present problems of validity (Austin et al., 1998). The reasons for these problems of validity are various. First, because of social desirability, participants do not always provide honest answers about their thoughts, feelings, attitudes, and so on. Second, participants may lack the introspective ability to provide accurate answers to a question even when they try to be honest. We are all to some extent unable to evaluate ourselves accurately. For that reason, there is a possibility that answers from self-report measurements are not accurate. Third, each participant has specific response styles and biases. Based on personality, cultural background, demographic factors, and so on, participants respond differently to the same question. To address these problems, we need to include objective measurements in future research. Objective health assessments from physicians, personality assessments that test neurophysiological functions, behavioral measurements that test

SOC usage in specific contexts, and observations for assessing their social goal types, can all be used to supplement self-reports.

Third, this study collected data from older adults who live in the Los Angeles metropolitan area, including Los Angeles county, Riverside county, and San Bernardino county. That is, participants in this study were not diverse with respect to region. In addition, because data were collected through the Adult Day Care Health Center (ADHC) in this area, older adults in this study may live relatively independently, have access to community resources, and have motivations and interest to participate in various activities, to socialize with others, and to enhance their psychological health. To achieve greater generalizability, future research should include older adults who have different physical functional levels, different access to community resources, and different motivation for maintaining or improving psychological health.

Implications and Future Directions

This study supported the view that there is significant interindividual variability in aging. Older adults experience aging at different speeds on different dimensions, at different ratios between gain and loss, and so on. Older adults take different developmental paths depending on biological factors, environmental factors, and interactions between these two factors. According to this current study, when older adults selected goal achievement strategies and focused on specific social goals, their decisions were based on their resource levels, current health, education level, and personality.

These results could offer important implications to academics supporting the view that it is necessary to consider individual factors if we wanted to understand aging and development during late adulthood. Especially, the current study found that different goal achievement strategies and different goal types significantly moderated the relationships between life

satisfaction and neuropsychological systems in personality, including BIS-activation and BAS-activation. Gray (1970) assumed that individuals who had different levels of BIS-activation and BAS-activation would use different types of goal achievement strategies and different social goals in order to maintain or improve life satisfaction. In spite of the importance of this issue, few studies has investigated the effects of individual differences in BIS-activation and BAS-activation to examine the Selection, Optimization, and Compensation (SOC) theory or the Socioemotional Selectivity Theory (SST) or aging. For that reason, future research should address effects of BIS-activation and BAS-activation on selecting different goal achievement strategies and goal types.

These results could provide important practical implications in relation to older populations at the individual level such as counseling or clinical programs and at the organizational level. We could help older adults know that they could experience successful aging even though they have experienced declines in resources or had already faced resource limitations. In order to help older adults, we could develop or build programs that could be used in counseling or clinical settings or in organizations serving older adults. For achieving the goals of these programs, a few factors should be included in these programs. First, it is necessary to let older adults know how to acknowledge their resource levels and know the advantages and disadvantages of their resource levels. Second, these programs should assist older adults to select goal pursuit strategies and to change social goal types based on their resource levels in order to maintain or improve their life satisfaction and psychological well-being. These programs can introduce different goal achievement strategies and different goal types and address how these strategies and types are related to life satisfaction based on different individual factors. To provide these programs for older adults, we needed studies that included variables such as health

status and education level, which can influence the aging process, and participants who have diverse backgrounds and individual differences, are needed to understand the aging process and to integrate details from different studies. That is, it is necessary to build aging models that can be applied to groups of people who have similar individual resource levels by the organizations for older adults in cooperation with academic communities.

In addition, this study has implications for how society can contribute to a better aging process. Although there have been many changes from negative perspectives to more positive ones about aging, our society has traditionally believed that it is not easy to maintain or to improve psychological health if older adults have experienced declines in resources or already have limitations in resources. However, it may be possible to attain successful aging by using different goal strategies and different goal types depending on individual differences in resource levels. That is, this study can help give a bright perspective to positive aging and development.

Taking individual differences into account in modeling the aging process requires more studies that have research questions like the current study's focus on the impact of the usage of SOC strategies, and different social goals, on the relationships between individual factors and life satisfaction. To understand more fully the effects of SOC strategies and different social goals, we need to include additional individual factors such as current cognitive functional level, financial stability, and social support. For example, older adults who experience declines in their cognitive functioning may change their social goals from knowledge acquisition goals to emotion regulation goals and these changes may positively influence their life satisfaction. And those who experience losses in their cognitive functioning may start to use more loss-based selection and compensation strategies, rather than optimization strategies, for maintaining their life satisfaction. Previous studies showed that cognitive functioning, financial stability, and

social support significantly influence psychological health and adaptation in aging (Wilkinson, 2016; Wilson et al., 2013). During late adulthood, many adults experiencee changes in their cognitive functioning. However, older adults do not necessarily experience declines in financial stability and social support and these individual factors can work as protective factors or buffers to attain successful aging and psychological health (Wilkinson, 2016; Wilson et al., 2013). Although this current study investigated only three individual differences, many individual factors may influence positive aging and psychological well-being. And the effects of each individual factor on successful aging and psychological health may be different. For this reason, it is necessary to examine how various individual factors can influence positive aging.

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Appendix A

Selection, Optimization, and Compensation (SOC) Items

(Baltes, Baltes, Freund, & Lang, 1999)

"How much does each of these statements describe you?"

1 = Not at all like me

3 = Somewhat like me

5 = Very much like me

Elective Selection (ES)

ES1: I concentrate all my energy on few things.

Not at all like me 1 2 3 4 5 Very much like me

ES2: I always focus on the one most important goal at a given time.

Not at all like me 1 2 3 4 5 Very much like me

ES3: When I think about what I want in life, I commit myself to one or two important goals.

Not at all like me 1 2 3 4 5 Very much like me

ES4: To achieve a particular goal, I am willing to downgrade other goals.

Not at all like me 1 2 3 4 5 Very much like me

ES5: I always pursue goals one after the other.

Not at all like me 1 2 3 4 5 Very much like me

ES6: I know exactly what I want and what I don't want.

Not at all like me 1 2 3 4 5 Very much like me

ES7: When I decide upon a goal, I stick to it.

Not at all like me 1 2 3 4 5 Very much like me

ES8: I always direct my attention to my most important goal.

Not at all like me 1 2 3 4 5 Very much like me

ES9: I make important life decisions.

Not at all like me 1 2 3 4 5 Very much like me

ES10: I consider exactly what is important for me.

Not at all like me 1 2 3 4 5 Very much like me

ES11: I don't have many goals in life that are equally important to me.

Not at all like me 1 2 3 4 5 Very much like me

ES12: I have set my goals clearly and stick to them.

Not at all like me 1 2 3 4 5 Very much like me

Loss-Based Selection (LBS)

LBS1: When things don't go as well as before, I choose one or two important goals.

Not at all like me 1 2 3 4 5 Very much like me

LBS2: When I can't do something important the way I did before, I look for a new goal.

Not at all like me 1 2 3 4 5 Very much like me

LBS3: When I can't do something as well as I used to, I think about what exactly is important to me.

Not at all like me 1 2 3 4 5 Very much like me

LBS4: If I can't do something as well as before, I concentrate only on essentials.

Not at all like me 1 2 3 4 5 Very much like me

LBS5: When I can't carry on as I used to, I direct my attention to my most important goal.

Not at all like me 1 2 3 4 5 Very much like me

LBS6: When something becomes increasingly difficult for me, I consider which goals I could achieve under the circumstances.

Not at all like me 1 2 3 4 5 Very much like me

LBS7: When things don't work so well, I pursue my most important goal first.

Not at all like me 1 2 3 4 5 Very much like me

LBS8: When something requires more and more effort, I think about what exactly I really want.

Not at all like me 1 2 3 4 5 Very much like me

LBS9: When things don't go as well as before, I drop some goals to concentrate on the more important ones.

Not at all like me 1 2 3 4 5 Very much like me

LBS10: When I am not able to achieve something anymore, I direct my effort at what is still possible.

Not at all like me 1 2 3 4 5 Very much like me

LBS11: When things don't go as well as before, I think about what, exactly, is really important to me.

Not at all like me 1 2 3 4 5 Very much like me

LBS12: When I can no longer do something in my usual way, I think about what, exactly, I am able to do under the circumstances.

Not at all like me 1 2 3 4 5 Very much like me

Optimization (O)

O1: I keep working on what I have planned until I succeed.

Not at all like me 1 2 3 4 5 Very much like me

O2: I make every effort to achieve a given goal.

Not at all like me 1 2 3 4 5 Very much like me

O3: If something matters to me, I devote myself fully and completely to it.

Not at all like me 1 2 3 4 5 Very much like me

O4: I keep trying until I succeed at a goal.

Not at all like me 1 2 3 4 5 Very much like me

O5: I do everything I can to realize my plans.

Not at all like me 1 2 3 4 5 Very much like me

O6: When I choose a goal, I am also willing to invest much effort in it.

Not at all like me 1 2 3 4 5 Very much like me

O7: When I want to achieve something difficult, I think carefully about the best time and opportunity to act.

Not at all like me 1 2 3 4 5 Very much like me

O8: When I have started something that is important to me, but has little chance of success, I make a particular effort.

Not at all like me 1 2 3 4 5 Very much like me

O9: When I want to get ahead, I also look at how others do it who succeed.

Not at all like me 1 2 3 4 5 Very much like me

O10: I think about exactly how I can best realize my plans.

Not at all like me 1 2 3 4 5 Very much like me

O11: When something is important to me, I don’t let setbacks discourage me.

Not at all like me 1 2 3 4 5 Very much like me

O12: I think about when exactly I can best realize my plans.

Not at all like me 1 2 3 4 5 Very much like me

Compensation (C)

C1: When things don't go as well as they used to, I keep trying other ways until I can achieve the same results I used to.

Not at all like me 1 2 3 4 5 Very much like me

C2: When something in my life isn't working as well as it used to, I ask others for help or advice.

Not at all like me 1 2 3 4 5 Very much like me

C3: When it becomes harder for me to get the same results, I keep trying harder until I can do it as well as before.

Not at all like me 1 2 3 4 5 Very much like me

C4: For important things, I pay attention to whether I need to devote more time or effort.

Not at all like me 1 2 3 4 5 Very much like me

C5: In particularly difficult life situations, I try to get help from doctors, counselors or other experts.

Not at all like me 1 2 3 4 5 Very much like me

C6: When things aren't going so well, I accept help from others.

Not at all like me 1 2 3 4 5 Very much like me

C7: When things don't work the way they used to, I look for other ways to achieve them.

Not at all like me 1 2 3 4 5 Very much like me

C8: When I can't do something as well as before, then I find out about other ways and means to achieve it.

Not at all like me 1 2 3 4 5 Very much like me

C9: When I can't do something as well as I used to, then I ask someone else to do it for me.

Not at all like me 1 2 3 4 5 Very much like me

C10: When I am afraid of losing something that I've achieved, then I invest more time and effort in it.

Not at all like me 1 2 3 4 5 Very much like me

C11: When something doesn't work as well as usual, I look at how others do it.

Not at all like me 1 2 3 4 5 Very much like me

C12: When something does not work as well as before, I listen to advisory broadcasts and books as well.

Not at all like me 1 2 3 4 5 Very much like me

Appendix B

Socioemotional Selectivity Theory (SST) Items (*The Revised Change in Activity and Interest Index)*

(Adams & Sanders, 2010)

Thinking of yourself nowadays and comparing yourself to how you usually were 10 years ago, please answer each of the questions.

-2 = Much less now

-1 = less now

0 = about the same amount

+1 = More now

+2 = Much more now

1. I enjoy visiting with old friends or longtime neighbors.

    Much less now/ Less now/ About the same amount/ More now/ Much more now

2. I am interested in meeting and getting to know new people.

    Much less now/ Less now/ About the same amount/ More now/ Much more now

3. I care about the upkeep of my home.

    Much less now/ Less now/ About the same amount/ More now/ Much more now

4. I like to attend plays, concerts, lectures, or classes.

    Much less now/ Less now/ About the same amount/ More now/ Much more now

5. I enjoy things like reading, crosswords, solitaire, puzzles, or computer work.

    Much less now/ Less now/ About the same amount/ More now/ Much more now

6. I like to visit with my family and relatives—children, grandchildren, siblings.

Much less now/ Less now/ About the same amount/ More now/ Much more now

7. I like to go to new restaurants or visit new places.

Much less now/ Less now/ About the same amount/ More now/ Much more now

8. I make plans for the future.

Much less now/ Less now/ About the same amount/ More now/ Much more now

9. My circle of friends is

Much smaller now/ Smaller now/ About the same/ Bigger now/ Much bigger now

10. I like to entertain others in my home.

Much less now/ Less now/ About the same amount/ More now/ Much more now

11. I'm interested in making or creating things (for example: art, crafts, music, carpentry, writing, baking or cooking, household projects).

Much less now/ Less now/ About the same amount/ More now/ Much more now

12. I enjoy taking care of people or things (for example: plants, animals, grandkids, a sick loved one).

Much less now/ Less now/ About the same amount/ More now/ Much more now

13. I like to hear from family members and close friends.

Much less now/ Less now/ About the same amount/ More now/ Much more now

14. I am interested in shopping and buying things.

Much less now/ Less now/ About the same amount/ More now/ Much more now

15. Invitations to social events with people I'm not well acquainted with are

Much less appealing/ Less appealing/ About the same/ More appealing/ Much more appealing

16. I like getting together with old friends.

Much less now/ Less now/ About the same amount/ More now/ Much more now

17. Keeping up with my hobbies is

Much less now/ Less now/ About the same amount/ More now/ Much more now

18. I attend meetings, groups, or club.

Much less now/ Less now/ About the same amount/ More now/ Much more now

19. I call friends or family on the phone.

Much less now/ Less now/ About the same amount/ More now/ Much more now

Appendix C

Satisfaction with Life Scale

(Diener, Emmons, Larsen, & Griffin, 1985)

Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number in the line preceding that item. Please be open and honest in your responding.

1. In most ways my life is close to my ideal.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

2. The conditions of my life are excellent.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

3. I am satisfied with my life.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

4. So far I have gotten the important things I want in life.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

5. If I could live my life over, I would change almost nothing.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Appendix D

Behavioral Inhibition System (BIS)/ Behavioral Activation System (BAS)

(Carver & White, 1994)

Each item of this questionnaire is a statement that a person may either agree with or disagree with. For each item, indicate how much you agree or disagree with what the item says. Choose only one response to each statement. Please be as accurate and honest as you can be. Respond to each item as if it were the only item. That is, don't worry about being "consistent" in your responses. Choose from the following four response options:

1 = very false for me
2 = somewhat false for me
3 = somewhat true for me
4 = very true for me

1. A person's family is the most important thing in life.

Very false for me 1 2 3 4 Very true for me

2. Even if something bad is about to happen to me, I rarely experience fear or nervousness.

Very false for me 1 2 3 4 Very true for me

3. I go out of my way to get things I want.

Very false for me 1 2 3 4 Very true for me

4. When I'm doing well at something I love to keep at it.

Very false for me 1 2 3 4 Very true for me

5. I'm always willing to try something new if I think it will be fun.

Very false for me 1 2 3 4 Very true for me

6. How I dress is important to me.

Very false for me 1 2 3 4 Very true for me

7. When I get something I want, I feel excited and energized.

Very false for me 1 2 3 4 Very true for me

8. Criticism or scolding hurts me quite a bit.

Very false for me 1 2 3 4 Very true for me

9. When I want something I usually go all-out to get it.

Very false for me 1 2 3 4 Very true for me

10. I will often do things for no other reason than that they might be fun.

Very false for me 1 2 3 4 Very true for me

11. It's hard for me to find the time to do things such as get a haircut.

Very false for me 1 2 3 4 Very true for me

12. If I see a chance to get something I want I move on it right away.

Very false for me 1 2 3 4 Very true for me

13. I feel pretty worried or upset when I think or know somebody is angry at me.

Very false for me 1 2 3 4 Very true for me

14. When I see an opportunity for something I like I get excited right away.

Very false for me 1 2 3 4 Very true for me

15. I often act on the spur of the moment.

Very false for me 1 2 3 4 Very true for me

16. If I think something unpleasant is going to happen I usually get pretty "worked up."

Very false for me 1 2 3 4 Very true for me

17. I often wonder why people act the way they do.

Very false for me 1 2 3 4 Very true for me

18. When good things happen to me, it affects me strongly.

Very false for me 1 2 3 4 Very true for me

19. I feel worried when I think I have done poorly at something important.

Very false for me 1 2 3 4 Very true for me

20. I crave excitement and new sensations.

Very false for me 1 2 3 4 Very true for me

21. When I go after something I use a “no holds barred” approach.

Very false for me 1 2 3 4 Very true for me

22. I have very few fears compared to my friends.

Very false for me 1 2 3 4 Very true for me

23. It would excite me to win a contest.

Very false for me 1 2 3 4 Very true for me

24. I worry about making mistakes.

Very false for me 1 2 3 4 Very true for me

Appendix E

Background Information

1. How old are you? _____ Years old

2. What is your race?

a. White

b. Black / African American

c. Asian

d. Hispanic or Latino

e. American Indian or Alaska Native

f. Native Hawaiian or Other Pacific Islander

g. Other (*Please specify*)

3. Are you currently (*check only one*):

a. Married

b. Separated

c. Widowed

d. Divorced

e. Single (Never Married)

f. Cohabitation

4. How often do you spend time in religious activities, such as pray, meditation, Bible study, or attend church, temple, or mosque?

a. Rarely or Never

b. a few times a month

c. Once a week

d. two or more times a week

e. Daily or more often

5. What is your highest educational level?

a. Less than high school

b. Some high school, no diploma or equivalent”

c. High school diploma or equivalent

d. Associates degree

e. Some college, no degree

f. Bachelor’s degree

g. Master’s degree

h. Doctoral or professional degree

6. In general, would you say your health is?

a. Excellent

b. Very Good

c. Good

d. Fair

e. Poor

Please think about your life before retirement (7-9).

7. When you retired from both your primary career and any part time jobs, how old were you?

_____Years old

_____Not yet retired

8. In terms of your occupation before retirement, how would you characterize yourself? Please give your job title.

9. Please select the occupational type that best describes your work before retirement.

a. Management

b. Professional

c. Service

d. Sales

e. Office and administrative support

f. Production, installation, maintenance

g. Farming

h. Armed service

g. Other (*Please specify*)

10. Before retirement, did you have a chronic medical condition?

a. Yes (*If yes, go to #11*)

b. No (*If no, please go to the next section*)

11. If you had chronic medical conditions before retirement, did these conditions affect your retirement decision?

a. Yes

b. No

Appendix F

Instrumental Activity of Daily Living

(Brim, Ryff, & Kessler, 2004)

The Following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

	A lot	Some	A little	Not at all
1. Lifting or carrying groceries	1	2	3	4
2. Climbing several flights of stairs	1	2	3	4
3. Bending, kneeling, or stooping	1	2	3	4
4. Walking more than a mile	1	2	3	4
5. Walking several blocks	1	2	3	4
6. Vigorous activities (e.g., running, lifting heavy objects)	1	2	3	4
7. Moderate activities (e.g., bowling, vacuuming)	1	2	3	4

Health Status Questionnaire. Version 2

(Health Outcomes Institute, 1993)

1. During the past 4 weeks, how much difficulty did you have doing your work or other regular daily activities as a result of your physical health?

a. None at all
b. A little bit
c. Some
d. Quite a bit
e. Could not do regular daily activities

2. 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?

a. Not at all
b. Slightly
c. Moderately
d. Quite a bit
e. Extremely

3. How much bodily pain have you had during the past 4 weeks?

a. None
b. Very mild
c. Mild
d. Moderate
e. Severe
f. Very severe