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Dissertation Committee:

Martha Storandt, Chair
Brian Carpenter
Tom Rodebaugh
Todd Braver
David Gillespie
Susan Stark

Quality of Life and Affect across the Adult Lifespan

by

Patrick James Brown

A dissertation presented to the Graduate School of Arts and Sciences of
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Abstract

Quality of Life and Affect across the Adult Lifespan

by

Patrick James Brown

Doctor of Philosophy in Psychology

Washington University in St. Louis, 2009

Professor Martha Storandt, Chair

The premise of this dissertation is based on the work of M. Powell Lawton, in particular his theories of *Environmental Press* (Lawton and Nahemow, 1973) and the *Dual-Channel Hypothesis* (Lawton, 1996; Lawton, Winter, Kleban, & Ruckdeschel, 1999). Study 1 used a correlational approach to test Lawton and colleagues (1999) model in a community sample of people across the adult lifespan, thereby expanding previous findings to individuals under age 60. Study 2 used an experimental approach to determine if individuals are affectively susceptible to differing environmental conditions based on their performance on a cognitive task. Whereas Study 1 provided a naturalistic picture of the interrelationships between affect and how individuals perceive the various facets of their lives, Study 2 allowed for a controlled look at the singular effect of objective environment on affective experience.

In the correlational study I found that Lawton's dual channel hypothesis (1996) was an insufficient model for explaining the relationships between quality of life and affect. The quality of an older adult's physical health directly influenced negative affect and indirectly influenced positive affect by influencing the quality of externally engaging

phenomena such as environmental satisfaction and time quality, which in turn directly influenced positive affect. These relationships were replicated in a younger sample, providing further evidence that the dual channel hypothesis is insufficient as a model of quality of life and affect and that these relationships are as complex in younger adults as they are in older adults. The findings from Study 2 contributed to this notion. With age, the more it appears we actively select environmental conditions that allow us to maximize our positive affect and minimize our negative affect.

Perhaps most notably is the role personality played in how individuals perceived and managed their environment and how individuals experienced affect. Neurotic individuals were not only more prone to perceive their lives as lower in quality, but they were also more sensitive to poor environmental conditions. These studies reveal the complexity of the relationships between how we perceive our lives, how we experience our environments, and how these perceptions and experiences influence our subjective well-being.

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CHAPTER 1: INTRODUCTION

The premise of this dissertation is based on two theories presented and studied by M. Powell Lawton. The first of these theories focused on environmental press and described the relationship between individuals and their environment (Lawton & Nahemow, 1973). The theory surmised that when the environmental burden becomes too great or too easy for the competence of the individual the individual experiences an increase in negative affect. It is a simple assertion of what is a constant interplay between environments and individuals who are adapting, coping, or selecting different compensatory behaviors to adjust to either changing capabilities or environmental demands.

Years later Lawton expounded on this notion of environmental press by proposing a four-pronged phenomenon he called the good life (Lawton, 1983, p. 349). The notion of the good life included *behavioral competence*, or the "theoretical upper limit of capacity of the individual to function in the areas of biological health, sensation and perception, motor behavior, and cognition" (p. 350); *psychological well-being*, or the "subjective evaluation of the overall quality of one's inner experience" (p. 350); *perceived quality of life*, or the "set of evaluations that a person makes about each major domain of his or her life" (p. 352); and *objective environment* (p. 352). This fourth facet included the *physical environment* (i.e., physical surroundings), the *personal environment* (i.e., different roles individuals play), the *small-group environment* (i.e., two or more people with whom the individual interacts), the *suprapersonal environment* (i.e., the characteristics of the groups including age, socioeconomic status, socioeconomic status,

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or race), and the *social environment* (i.e., the cultural forces that influence the individual and the groups).

By evaluating and measuring the four facets of the good life, Lawton furthered the growth of areas of research outside mainstream psychology including areas such as architecture, transportation, and neighborhood planning with a goal to provide individuals, especially older individuals, with places that better fit their capabilities thereby resulting in more positive psychological outcomes (Lawton, 1989).

Objective measures of physical environment and behavioral competence allow policy to be made regarding issues related to housing needs, independent living, and mental health interventions for a group of people, but subjective measures reflect the adaptive or selective evaluations that take place at the individual level (Lawton, 1991). Consider a disabled individual. The very presence of the disability has health care and housing ramifications based on policies formed around the mere presence or absence of a disability. This, however, says nothing about how the individual perceives the situation. Subjectively this person may not view the self or life in a negative way; the person simply may perceive the quality of life as largely positive or may have adapted a home environment to better manage the disability and hence report a high sense of subjective well-being. This very notion is exemplified by the low to moderate correlations often reported between objective health measures and subjective well-being (Brief, Butcher, George, & Link 1993; Lawton, Winter, Kleban, & Ruckdeschel, 1999; Okun & George, 1984). It is not the presence or absence of health issues but rather the perception of one's health that is the most strongly related with subjective well-being.

It was under this theoretical model that the present research was conducted. This research was concerned with how individuals perceive different aspects of their lives – social, physical, and environmental – and how these perceptions relate to subjective well-being. Throughout this dissertation subjective well-being is used interchangeably with the two main aspects of it: positive and negative affect (Diener et al., 1999). A better understanding of the interplay between different domains of quality of life and an individual's affect can provide important information in a clinical setting. The central premise of many psychotherapies including cognitive-behavioral therapy is to better manage and adapt one's daily life to maximize positive affect and minimize negative affect. Pleasant event scheduling, relaxation exercises, thought monitoring, and challenging of maladaptive automatic thoughts are all key components that deal not specifically with the objective environment but rather with how individuals perceive this environment. Breaking the cycle between maladaptive thoughts and poor environmental management could help alleviate the experience of negative affect that, when severe, results in depression and anxiety-related disorders. Assessing how an individual perceives the environment may provide a glimpse to the therapist of how clients see the world and how best to help clients manage this world.

Using the subjective aspects of the model proposed by Lawton and colleagues (1999), I explored the evaluations of various domains of one's life and their relation to well-being in Study 1. I extended previous research to observe these relationships cross-sectionally across the adult lifespan and across different methods for measuring affect. I also explored the relationships between these variables and personality. In Study 2 I

examined the effects of objective environment on affect using an experimental manipulation of the laboratory environment during a demanding cognitive task.

What follows in Chapter 2 is a brief review of the multiple fields from which this dissertation research draws. Research related to subjective well-being, including the history of measuring these abstract phenomena as well as the varying research findings when considering the entire lifespan, is explored. Then the research on correlates of well-being including positive and negative affect as well as life satisfaction, largely considered the third component of subjective well-being, is examined. Theories of aging that are related to well-being are described. Theories such as socioemotional selectivity theory (Carstensen, Isaacowitz, & Charles, 1999), selective optimization with compensation (Baltes & Carstensen, 2003), and environmental press (Lawton & Nahemow, 1973) have all included positive and negative affect in their models. The different mechanisms hypothesized to be at work in these theories are discussed and analyzed as they relate to the basic hypothesis of this present research project. In the third chapter I specify the conceptual model on which this project is based and enumerate the relationships under investigation in Study 1 and Study 2. In the fourth chapter I present the methodologies used for the two studies including a summary of the participants, the measures used in Study 1, and the experimental procedure used in Study 2. In the fifth chapter I present the results from both Study 1 and Study 2. A discussion of these findings and how they are related to past research is provided in the sixth chapter.

CHAPTER 2: LITERATURE REVIEW

Subjective Well-Being

Subjective well-being is a term used to describe emotional or affective states that humans experience and discuss on a daily basis. The notion that there is a complex relationship between the environment and affect can be traced to the evolutionary theory posited by Darwin over 100 years ago. Darwin (1872) theorized that when individuals perceived danger in the environment a change in their internal state such as an increase in anxiety occurred, thereby directing the appropriate behavior to be taken (i.e., fight or flight). Darwin's theory was the first to suggest that affect, environment, and behavior were highly related (Strongman, 1987). Others have continued this line of research on the relationships between thought (life satisfaction) and emotion (affect; Stock, Okun, & Benin, 1986).

Gray (1981, 1982, 1985, 1991) demonstrated that affect is part of a larger biobehavioral system that encompasses cognitive, behavioral, biological, and affective components. The affective experiences of daily life can be viewed as adaptive by evolutionary standards. We can surmise that, as Darwin hypothesized, the moods we experience have survival value (Clark & Watson, 1994; Thayer, 1989). Negative affect can be viewed as an aspect of the behavioral inhibition system that keeps us out of trouble, inhibiting behavior that causes pain or has negative consequences and alerting us to distress. Positive affect can be viewed as an aspect of the behavioral activation system that leads us to approach activities or behaviors that are perceived to be positive and rewarding (Watson, 2000, p. 26).

Gray's multidimensional BIS/BAS system resembles the approach taken currently in diagnosis and assessment of Axis 1 disorders as described in the Diagnostic and Statistical Manual of Mental Disorders IV (DMS-IV, 1994). Symptoms of a disorder like major depression correspond with various problematic behaviors (psychomotor retardation or agitation), affect (feelings of sadness and emptiness), physical changes (weight gain or loss, fatigue, insomnia), and cognitions (loss of interest or pleasure, diminished ability to concentrate, thoughts of worthlessness and death). Major affective issues have been studied as outcomes caused by irrational beliefs (Ellis, 1987) or maladaptive cognitions (Beck, 1991) as well as the cause of increases in these types of beliefs or cognitions (Thayer, 1989; Watson, 2000).

This multidimensional system view of affect, behavior, and cognition is the basis for the *feedback loop*, a cognitive-behavioral model of affect and cognition working together to maintain an affective state such as depression or anxiety. The loop begins when an event takes place. It is followed by a thought and then a feeling following the thought. The feeling can be both physiological, such as increased heart rate, and emotional, such as increased anxiety. These feelings and thoughts begin to feed off of one another, increasing the experiences of negative affect unless the loop is disrupted (McKay, Davis, & Fanning, 1997).

Although there is disagreement about whether thoughts occur prior to affect or vice versa (Zajonc, 1984), Watson (2000) thought this argument to be largely unproductive. He wrote that these components work together "*in synchrony*" (p. 23), a result of evolution and natural selection to create our affective experience. It is the cohesiveness or synchrony of this biobehavioral system that is illustrated in the literature

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showing that not just one but varying treatments of depression have been successful: biological treatments (Apfeldorf, & Alexopoulos, 1999), cognitive treatments (Beck, 1991), behavioral treatments (Bosscher, 1993). These findings imply how interrelated these systems are.

It is this general understanding of subjective well-being and its relation to behavior and the world around us that prompted this study. We as living, breathing organisms constantly interact and experience the world around us and, as Darwin (1872) and others posited, when we perceive something as negative (threatening), negative affect increases to signal a necessary change. The DSM-IV (1994) categorizes disorders that can be viewed as states in which these adaptive affective experiences have gone awry. Studying how we perceive our environment and its association with affect can increase our ability to understand our place in the world and the world's effect on us. As this review continues, the two-factor model of affect will be described as will the ways that researchers have thought about aging and development's interaction within this affective system.

Components of Subjective Well-Being

Positive and Negative Affect

Over the last 40 years research defining subjective well-being and its correlates has advanced our understanding of just what this construct means. As Diener and colleagues wrote in their comprehensive review of the field, "Growth in the field of subjective well-being reflects larger societal trends concerning the value of the individual, the importance of subjective views in evaluating life, and the recognition that well-being necessarily includes positive elements that transcend economic prosperity"

(Diener, Suh, Lucas, & Smith, 1999, p. 276). By shifting focus from the negative to the positive states that individuals report, psychologists have begun to turn the tide on psychology's concentration and fascination with negativity that has permeated the literature (Myers & Diener, 1995).

Bradburn (1969) identified two relatively independent constructs that have now become the major dimensions of subjective well-being research: positive and negative affect.   Their independence has been debated. Many researchers have found support for the idea of two independent, separable constructs of affective well-being (Diener & Emmons, 1984; Zevon & Tellegen, 1982). Watson (2000, pp. 45-46) reported mostly weak to moderate correlations between different aspects of the Positive and Negative Affect Schedule Expanded Form (PANAS-X; Watson & Clark, 1994) ranging between .00 and .34, with only two of the 24 correlations between aspects of positive and negative affect greater than .25. He also showed that changing the response format from extent (i.e., how much of the affect are you experiencing) to frequency (i.e., how often you experience the affect) increased the correlation between positive and negative but only slightly, despite some assertions to the contrary (Warr, Barter, & Brownbridge, 1983; Watson, 2000).

Some have challenged the conclusion that the constructs are independent, especially as the time frame of the report increases (Diener & Emmons, 1984). Watson and Clark (1997a) examined the changes in correlations between positive and negative affect under different time frames. The correlations increased from more present-centered timing (at this moment or today) to other more distant time frames (past few days, past week, past month) but the increase was negligible (.05 for today to .23 for the

past year). Thus, as observed with the change from extent to frequency, there may be increases to the correlation between positive and negative affect as the time frame becomes longer, but they are small in magnitude. Thus research on subjective well-being seems to confirm the idea of separable positive and negative affective factors (Cacioppo, Gardner, & Berntson, 1999; Keyes, 2000).

This is not, however, the only issue that is debated regarding the measurement of affect. Watson (2000) recognized that the adjective list on the PANAS included only high arousal items, both positive activation and negative activation items. Carver and Scheier (1998) described negative "deactivated" affects such as sadness as important components of their approach/promotion system, yet these deactivated affects are not measured by the PANAS. Research has shown that there may indeed be two bipolar dimensions of affect consisting of pleasant activated items with the inverse being unpleasant deactivated items, and unpleasant activated items with the inverse being pleasant deactivated items (Feldman Barrett & Russell, 1998). Although this debate continues, for the purposes of this project the two components of subjective well-being, positive and negative affect as measured by the PANAS, will suffice.

Researchers have hypothesized that not only are positive and negative affect relatively independent, but they relate differently to different phenomena. Lawton (1996) hypothesized what he called the *dual channel* effect. This hypothesis states that more externally engaging phenomena such as increased social interactions will increase positive affect but have very little influence on negative affect, whereas more internal constructs such as health, self-esteem, and personality factors, in particular neuroticism, will enhance negative affect but not positive. Lawton and colleagues (1999) showed

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some support for this hypothesis when they found a strong relationship between the quality of friendships and positive affect and a weak but significant relationship between poor health and negative affect. The dual channel effect has similarities to Gray's (1981, 1982, 1985, 1991) behavioral activation system in that both view positive affect as strongly related to external rewards.

Life Satisfaction

Although the crux of the well-being literature concentrates on the two affective factors, a third, largely cognitive component termed *life satisfaction* is also related to this overarching notion of subjective well-being. This aspect of well-being represents the distance between our evaluations of where we are in life currently compared with where we aspire to be (Campbell, Converse, & Rodgers, 1976). The belief that we live largely in the objective world but react and respond based largely on our subjective interpretations of this world demonstrates the importance of studying subjective well-being (Keyes, Sjmotkin, & Ryff, 2000). Nowhere is this importance recognized more than in clinical psychology where it is this subjective evaluation of the state of a person's life that can not only lead a person to experience depression or anxiety but also lift a person from these states. In fact, a summary of the area of subjective well-being literature discusses the importance of not only the evaluation of one's general life satisfaction but also the satisfaction levels of different life domains including work, family, leisure, health, finances, the self, and one's social network (Diener et al., 1999).

Diener et al.'s (1999) review called for a movement in the study of subjective well-being to the use of methodologies such as structural equation modeling to look at hypothesized causal relationships between different areas of well-being. Because this is

one of the aims of the present project I will next review the correlates of subjective well-being reported in the literature to help determine the hypotheses for the structural model.

Correlates of Subjective Well-Being

Initial Description

A happy person is a "young, healthy, well-educated, well-paid, extroverted, optimistic, worry-free, religious, married person with high self-esteem, job morale, modest aspirations, of either sex and a wide range of intelligence" (Wilson, 1967, p. 294). Since Wilson wrote this sentence many of his conclusions have been shown to be inaccurate.

Age

Initial studies on the three components of subjective well-being showed a pattern similar to that outlined by Wilson (1967). Young people were seen as happier (Bradburn & Caplovitz, 1965). Subsequent studies, however, have shown either no age effect or an increase in life satisfaction in the later years (Andrews & Withey, 1976; Herzog & Rodgers, 1981; Stock, Okun, Haring, & Witter, 1983). Lawton, Kleban, and Dean (1993) found that younger adults endorse depression as well as anxiety and shyness more frequently whereas older adults reported less depression than younger age groups. In a large scale cross-sectional survey of an adult sample Diener and Suh (1998) reported an upward trend in life satisfaction from 20 to 80 years of age, with stability of negative affect across this age range; positive affect did, however, decline as age increased. Although there is some evidence for decreases in emotional intensity with increasing age (Diener, Sandvik, & Larsen, 1985), Ryff (1991) has shown that older adults fit closer to their own notion of their "ideal self" compared with younger adults.

The literature as a whole shows strong support contradicting Wilson's assumption that youth is an essential feature of happiness. In fact, the literature leans in the opposite direction, painting an encouraging picture of people's apparent successful ability to adapt to both physical and environmental changes as they age (Diener et al., 1999). Theories of aging will be discussed in more detail in the next section of this chapter.

Health

The relationship between health and well-being is a complicated one. Objective measures of health such as physician ratings, number of disorders, and number of visits to doctors or hospitals are, at best, weakly correlated with subjective well-being (Brief et al., 1993; Okun & George, 1984). Lawton and colleagues (1999) using structural equation modeling found that objective health did have a significant but weak association with negative affect, but this relationship operated indirectly through subjective health ratings. This finding has also been corroborated elsewhere (Brief et al., 1993). Although generally lower than people without disease, the life satisfaction of cancer patients (Breetvelt & van Dam, 1991) and patients with other various disabling conditions (Mehnert, Krauss, Nadler, Boyd, 1990) still remained higher than one would expect given their medical circumstances.

The popular explanation for these findings regarding health and subjective well-being is adaptation. Lawton (1991, p. 12) wrote about this while differentiating between objective and subjective health: "a person may suffer from a disability and be unable to walk alone. This compromise in ADL (activities of daily living) competence is an important facet of quality life. The same person's subjective view of his or her own competence is quite capable of having adapted to the objective disability and

compensated so complete in both behavior (e.g., mastered the wheelchair) and

psychological (e.g., no feeling of weakness) dimensions that the bottom-line meaning of

the disabled status is negated." Although he was arguing for the need for objective

measurement from a policy standpoint, Lawton (1991) emphasized the importance of the

subjective assessment of one's own health and its relationship with subjective well-being.

If one is interested in policy the objective measures allow one to extrapolate what the

most efficient architectural design or social program may be for a person with a certain

disability. From a clinical standpoint, however, subjective measures may be more crucial

because they provide an assessment of how health affects an individual's emotional state.

Education, Occupation, and Income

There have been four approaches to measuring the relationship between income

and subjective well-being: within-nation correlations, between-nation differences, income

change, and income change at the national level (Diener et al., 1999). Increases or

decreases in income did not produce differences in affect (Diener, Sandvik, Seidlitz, &

Diener, 1993) nor did increases in national income change national reports of well-being

(Diener & Suh, 1997). As income increased over the period from 1946 through 1989,

subjective well-being remained remarkably stable. Although the wealthy are somewhat

happier than the poor, and the wealthier nations happier than poor nations, the data as a

whole do not support a strong relationship between income and subjective well-being

(Diener et al., 1999).

The relationship of education and occupational status with subjective well-being

appears to operate indirectly through income. When controlling for income the

relationship between subjective well-being and education becomes insignificant (Diener

et al., 1993), and similar findings have been noted when occupation is controlled for as well (Witter, Okun, Stock, & Raring, 1984).

Personality

Although demographic variables explain a relatively small portion of the variance of subjective well-being (8 to 20%; Andrews & Withey, 1976; Argyle, 1999; Campbell et al., 1976) the association of personality with subjective well-being is substantial. An entire review article could be written on the various theories of personality and their relationship to affect. For the purposes of this project, however, I will focus primarily on the five factor model of personality.

Watson (2000) explored the relationship between the five factor model (NEO PI-R, Costa & McCrae, 1992) and positive and negative affect (PANAS-X; Watson & Clark, 1994) using regression analyses across six samples of undergraduates. All five factors entered simultaneously explained on average 38% and 44% of the variance in negative and positive affect, respectively. Analyzing the same data but now predicting each personality domain using positive and negative affect as the independent variables, Watson reported that over half of the variance in Neuroticism (56%) and Extraversion (55%) were explained by the combination of positive and negative affect; 40% in Conscientiousness, 38% in Agreeableness, and 9% in Openness were also explained (Watson, 2000, pp. 174-180).

Watson (2000) explored further the unique relationships between positive and negative affect and Neuroticism and Extraversion by looking at the partial correlations between Extraversion and negative affect controlling for the influence of Neuroticism and likewise the partial correlation between Neuroticism and positive affect controlling

for the influence of Extraversion. These correlations ranged from -.09 to -.22, allowing

Watson to conclude that "individual differences in negative affective experience are

strongly correlated with Neuroticism but are essentially unrelated to Extraversion;

conversely, individual differences in positive affective experience are strongly related

with Extraversion but only weakly related to Neuroticism" (Watson, 2000, p. 182).

The findings by Watson are consistent across the literature (Costa & McCrae,

1980, 1984; Tellegen, 1985; Watson & Clark, 1984, 1997b). Tellegen (1985) argued that

Neuroticism and Extraversion should be renamed Negative Emotionality and Positive

Emotionality, respectively, because of their close association with the two affective

factors of subjective well-being. In relation to the behavioral activation and inhibition

systems discussed in the initial section of this chapter, it has been suggested that

extraverts have an increased sensitivity to rewards and this can be seen by their increased

positive affect when exposed to reward stimuli (Lucas, Diener, Grob, Suh, & Shao,

2000). This is akin to the increased sensitivity to rewards that is associated with the

behavioral activation system; this system theorizes that we as individuals approach

activities or behaviors that are perceived to be positive and rewarding (Gray, 1991;

Watson, 2000). In fact, individuals high in Extraversion have been shown to be happier

whether they lived or worked alone or with someone else (Diener, Sandvik, Pavot, &

Fujita, 1992). Headey and Wearing (1989) further demonstrated that not only do these

individuals high in Extraversion experience more pleasant things and greater positive

affectivity, but those high in neuroticism tend to report more bad things happen to them

and report greater negative affectivity as a result.

These findings become more important when examined in the context of how the environment and the individual interact with each other and how this interaction affects subjective well-being. Preliminary findings point not to congruence between specific environmental situations and personality but rather to the interaction between personality and behaviors when predicting affective states (Moskowitz & Cote, 1995). For example, people high in agreeableness experienced greater pleasant affect when they engaged in agreeable behavior and unpleasant affect when they engaged in quarrelsome behavior. This research suggests that it is not the situation but rather how an individual manages that situation that determines an affective response.

Theories of Aging

Historical Perspective

Gerontology and the study of later life are fairly young fields in psychology. The U.S. Public Health Service founded a research program on aging in Baltimore in 1941. In 1947 the America Psychological Association added the Division on Adult Development and Aging. Over the past 60 years aging in industrialized countries has changed dramatically. Improvements in life style such as the promotion of exercise and improved eating habits, a movement away from hazardous habits such as smoking and drinking, and the betterment of sewer systems and medical care have helped to increase the amount of active, healthy years individuals experience. The increased cost of both medical insurance and postretirement living has resulted in older individuals remaining active in the workforce longer as well. All these factors increase the importance of studying later life in modern society. This importance can be recognized in such establishments as the 1975 creation of the National Institute of Aging and the

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subspecialization in geriatric psychiatry by the American Board of Psychiatry and Neurology in 1991 (Birren & Schroots, 2001).

The scientific study of gerontology may be recent, but the fascination with the later years and end of life dates back to early Greek mythology. It was not until 1950, however, that a brief (three pages) theory of the psychological processes that occur in later life was posited. Erik Erikson, in outlining a developmental stage theory, hypothesized that the last stage of life, *Ego Integrity vs. Despair,* is when a sense of fulfillment about life permeates within and death "loses its sting" (Erikson, 1950, p. 232). He wrote, "Trust (the first of our ego values) is here defined as 'the assured reliance on another's integrity,' the last of our values…and it seems possible to further paraphrase the relation of adult integrity and infantile trust by saying that healthy children will not fear life if their parents have integrity enough not to fear death" (Erikson, 1950, p. 233). He described a peace with the life one led and a comfort in detaching one's self from an active role to take on the role of the wise elder.

The notion of detachment hinted at in Erikson's final stage of life was expanded in findings from the Kansas City Study of Adult Life leading Cumming and Henry (1961) to develop the theory of disengagement. The theory postulated that a mutual disengagement between society and the older individual gradually takes place as one's skills deteriorate and social support network diminishes in preparation for the final disengagement via death. This theory has been extensively criticized on a variety of fronts. For example, it was based largely on the American society in the 1950s and 1960s when the most common role for men was to work and women to tend to the home. It postulated a decline in knowledge in the older individual that has since been shown to be

inaccurate (Schaie, 1994, 1996). Disengagement was found to be inconsistent. Carp (1969) reported that disengaging from family was negatively correlated with disengagement from friends. Tallmer and Kutner (1969) found that disengagement was related not to chronological age but to physical and social stress. Reductions in the size of an individual's network were observed in early- to midadulthood as opposed to late adulthood as disengagement theory hypothesized (Carstensen, 1992). Thus, disengagement theory has been replaced by alternative explanations of well-being.

Socioemotional Selectivity Theory

The process of decreasing social networks in adulthood appears to be highly selective. Acquaintances or peripheral relationships are terminated, and emotionally satisfying relationships are maintained throughout the second half of life (Lang 2000, 2001; Lang & Carstensen, 1994). This active selection of social networks is postulated to be tied to an individual's perception of his or her time remaining on earth. This notion of perceived time as a motivation for social goals is the cornerstone of socioemotional selectivity theory (Carstensen et al., 1999). When time is perceived as limited, present-centered goals that maximize emotional meaning have priority. It is this process that Carstensen, Lang, and colleagues believe leads to a gradual diminishing of social networks rather than what Cumming and Henry called disengagement. When perceived time is expansive, however, future-oriented goals bent on knowledge acquisition and career interests take precedence (Carstensen et al., 1999; Lockenhoff & Carstensen, 2004).

At first glance it may appear that chronological age is an important variable for proponents of socioemotional selectivity theory. This is not, however, the case. Age is

not a causal variable in this motivational theory. Carstensen and Fredrickson (1998) studied three groups of individuals with significantly different life expectancy: men with symptomatic HIV, men with asymptomatic HIV, and men who were HIV negative. All groups were roughly 37 years of age thereby eliminating the effect of age from the causal model. The authors found that symptomatic HIV men were more likely to classify prospective social partners in emotional terms as opposed to information-seeking or future contact terms. Moreover this pattern was consistent with the older adult classification on the same task, which led the authors to conclude that emotion becomes more important to people who perceive themselves as being closer to the end of their lives (Carstensen & Fredrickson, 1998).

Socioemotional selectivity theory is concerned not with specific social goals but with the apparent change in the priority of these goals whereby one places greater emphasis on emotionally satisfying experiences if one perceives time as limited. In terms of subjective well-being this emphasis on greater emotionally satisfying experiences explains the reporting of decreased frequency of negative affect (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Charles, Reynolds, & Gatz, 2001) and the relative stability or increase in positive affect as age increases (Carstensen et al., 2000; Mroczek & Kolarz, 1998). Socioemotional selectivity theory explains these findings by positing an increase in emotional regulation as one perceives time as limited, meaning that individuals become more successful at the maintenance of positive affect and the decrease of negative affect.

Memory is a process that can be influenced by an individual's goals. Research has shown that older people use emotional valence more often on tests of memory.

Older adults remembered emotional as opposed to neutral information without instruction (Carstensen & Turk-Charles, 1994), and their thought patterns resembled those of older and younger participants who were specifically directed to focus on emotions (Kennedy, Mather, & Carstensen, 2004). Turk-Charles, Mather, and Carstensen (2003) observed a negative trend for remembering negative images compared with positive and neutral images as age increased. Brain activity decreases in older adults when they view negative images, opposite of what has been found in younger adults; perhaps older adults are less sensitive to emotional stimuli and hence better able to regulate their emotions (Ito, Larsen, Smith, & Cacioppo, 1998; Wood & Kisley, 2006).

The process of selection is one of three processes in a developmental model of successful aging that broadens the application of socioemotional selectivity theory (Baltes & Carstensen, 2003). Selection under socioemotional selectivity theory is an adaptive process used in one's social life to best select those goals and surroundings that maximize emotionally meaningful experiences. In the broader developmental model of successful aging called selective optimization with compensation, *selection* is the ability to attain one's goals while minimizing losses and maximizing gains (Baltes & Baltes, 1990). Selection in this model broadens beyond simply social goals and refers primarily to goal setting whether it be attempting to reach a desired state or reconstructing a goal system to accommodate a loss of some sort (Freund & Baltes, 2002). The other two processes are *optimization* or acquiring and investing goal relevant means and *compensation,* the use of alternative means when previous means are no longer available. Optimization and compensation along with selection are seen as dynamic and interactive processes conducive to not only successful aging but successful development in general

(Baltes & Carstensen, 2003). Measures of these three processes are moderately

correlated with positive emotions, autonomy, and other measures of subjective well-being

(Freund & Baltes, 2002), and their use is apparently protective against a lack of personal

resources (including demographic, health, cognitive, and social resources) in the oldest

old (Jopp & Smith, 2006).

Socioemotional selectivity theory is concerned primarily with the internal

processes of motivation for changing social goals and social networks affecting

subjective well-being and emotional experiences. Socioemotional selectivity theory does

not account for external issues or environmental demands that are placed on us on a daily

basis. We experience a dynamic interaction between our desires and behaviors and what

the environment demands of us. A simple crack in the sidewalk can be the cause of an

injury that affects our ability to manage daily tasks that we once took for granted. What

was once part of our daily routine is no longer feasible because of changes in our physical

abilities. We must alter our goals to match these diminished abilities. This change has

little to do with our perception of time but rather the dynamic interplay between our

competences and the environment around us. A process of adaptation or compensation

(Backman & Dixon, 1992) is necessary, not necessarily one of selection that

socioemotional selectivity theory posits. A theory that includes this notion of

environmental influence and how the relationship between these influences and our own

abilities affects our behavior and affective experiences is described in the next section.

Ecology of Aging

In 1973 Lawton and Nahemow introduced a theory describing the dynamic

relationship between individuals and their environments. This relationship has both

behavioral and affective outcomes (Figure 1). The model identifies the spectrum

between an individual's behavioral competence (high to low) and the demands of the

environment entitled *environmental press* (high to low). When the relationship is close to

congruent there is a zone of maximum comfort (competence slightly higher than press) or

a zone of maximum performance potential (environmental press slightly higher than

competence). Positive affect and adaptive behavior result under these conditions

(Lawton, 1989). If individual competence and environmental press are severely

disproportionate to one another, negative affect and maladaptive behaviors result. The

model allows for all levels of competence and demanding environments and simplifies

what is a complex, dynamic process. It is the interaction between individual competence

and environmental demand that dictates behavior according to the ecological theory of

aging and leads to either positive or negative affective experiences.

Figure 1

Ecological model of adaptation and aging
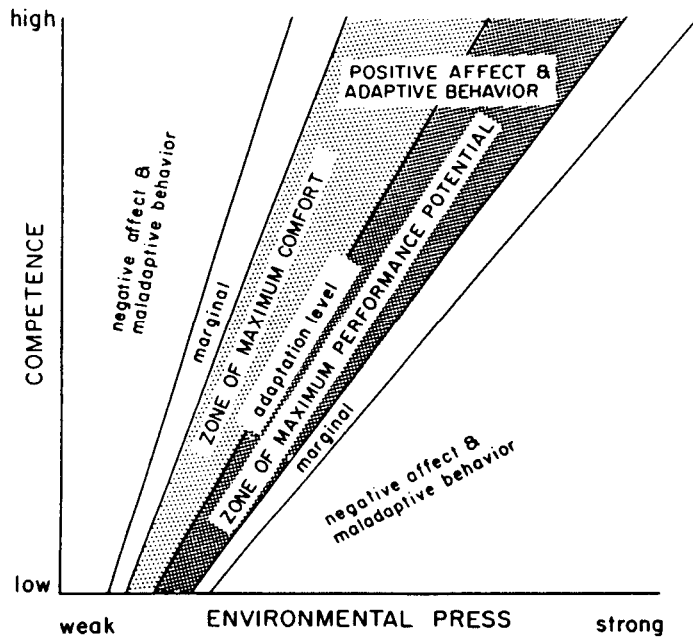
Lawton (1983) expanded his views on aging and the relationship between an individual and the environment in what he himself described as a "grandiose construct" (p. 349) entitled *the good life* (Figure 2). The construct, as mentioned in the introduction, is made up of four sectors: behavioral competence, psychological well-being, perceived quality of life, and objective environment. This model is essentially an expansion of Lawton and Nahemow's (1973) ecological theory of aging. Lawton expanded his initial understanding of behavioral competence to include not only the physiological but also social behavioral levels including intimacy, parenting, and love. Environmental press (Lawton & Nahemow, 1973) was expanded into two separate but related sectors in Lawton's model of the good life (1983): the objective environment and perceived quality of life. As discussed in an earlier section of this current chapter, objective and subjective measures of health have been shown to be either weakly or uncorrelated with one another (Brief et al., 1993). Lockenhoff and Carstensen (2004, p. 1396) referred to the apparent disconnection between a declining physical health and a stable or improving sense of well-being as individuals get older as the "paradox of aging." This research indicates how differently objective and subjective indicators relate to measures of affect. Because of this disconnection between objective and subjective indicators, Lawton stressed the inclusion of both the objective measurement of the environment as well as the perceived quality of this environment in his model of the good life (Lawton, 1983, 1991; Lawton et al., 1999).

Figure 2

The Good Life

The Good Life diagram showing four overlapping circles: Psychological Wellbeing, Perceived Quality of Life, Behavioral Competence, and Objective Environment.
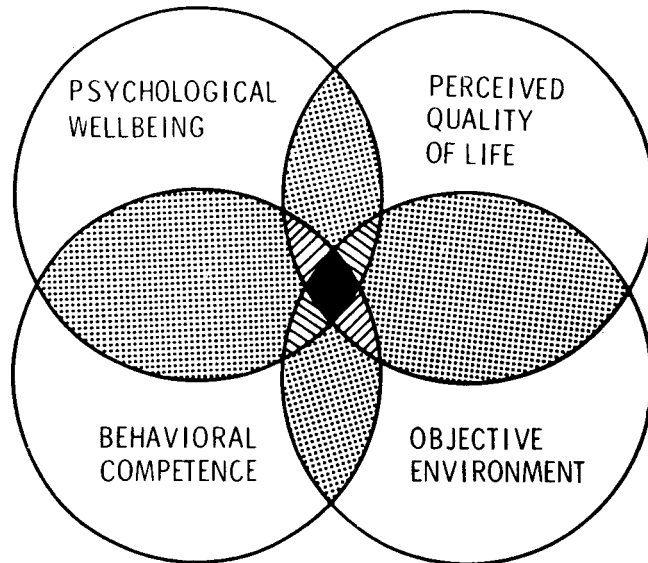
Note. Source: Lawton, M.P. (1983). Environment and Other Determinants of Well-Being

in Older People, The Gerontologist, 23, 349-357, p. 355.

The final sector, which Lawton called psychological well-being, consists of positive and negative affect which was included in his original model. Lawton and colleagues were quite interested in how these largely independent affective factors changed as a function of age. In a cross-sectional study they collected self-report measures of various affective experiences from three adult-age groups: young (M = 21 years of age), middle-aged (M = 41.7 years of age), and older adults (M = 69.3 years of age; Lawton, Kleban, Rajagopal, & Dean, 1992). They found that emotional factors they defined as *emotional control* ("the view that deliberate attempts to regulate the intensity, the eliciting circumstances, and the types of emotion experienced or expressed may be successful") and *emotional maturity through moderation* ("perception that life has taught one to moderate both the positive and negative feelings and to control the occurrence of situations likely to lead to emotional overload") increased across the three successive age-groups (Lawton, et al., 1992, p. 172). They also observed that middle-aged and older adults reported an increased ability to differentiate between reacting to pleasant and unpleasant transactions. Whereas young adults reported these reactions as one coherent personality style, middle-aged and older adults reported positive and negative transactions as partially independent of one another perhaps demonstrating an increase in developmental specificity in the experiencing of emotions as one ages (Labouvie-Vief, DeVoe, & Bulka, 1989; Labouvie-Vief, Hakim-Larson, DeVoe, & Schoeberlein, 1989).

In these same three age groups, Lawton et al. (1993) looked at the structure of positive and negative affect and how, if at all, it varied with age. The reported frequency of negative affect including depression, anxiety-guilt, shyness, and hostility all decreased with age. This decrease in frequency of affective experiences however was not observed

in positive affect; the mean levels remained stable across the three age groups. Similar findings were published recently in the Midlife Development in the United States study (MIDUS; Brim, Ryff, & Kessler, 2004). Mroczek (2004) observed that the mean levels of negative affect decreased across three successive age groups of young, middle, and older adults. The mean levels of positive affect increased with age, findings that differ from those of Lawton et al. (1993) and others (Charles et al. 2001).

Although there appears to be growing consensus that negative affective experiences decrease across the adult lifespan, albeit based mainly on cross-sectional studies, the understanding of the causal mechanisms of this decrease are still debated. Some emphasize physiological changes (Gatz, Kasl-Godley, & Karel, 1996; Panksepp & Miller, 1996), whereas Carstensen and colleagues (1999) focus on the altering of one's changing perceptions of time. Lawton seems to argue for a more external causal mechanism whereby people's competence and environmental press interacted, thereby determining our emotional experiences. He hypothesized that, "habituation to repetitive patterns of behavior, thought, and emotion does construct experience, and it could well be that patterned behavior fills up life so that neither new events nor new internal experiences occur with the frequency they once did" (Lawton, 1989, p. 151).

Lawton applied his theories and his propensity for naturalistic over experimental studies when he investigated how both objective and subjective measures of quality of life relate to positive and negative affect (Lawton et al., 1999). What follows in Chapter 3 is a description of the model of the relationship between quality of life and affect in older adults, how this model acts as the rationale for the present project, and how the present project continues and expands the model across the adult lifespan.

CHAPTER 3: RATIONALE AND HYPOTHESES

Rationale

Lawton et al.'s (1999) research focused on how changes in the competences of older adults affect their ability to manage their environments and how this change in the person-environment relationship could lead to negative outcomes.   They were interested in assessing both the objective and subjective aspects of older adults' environment and observing how these related to positive and negative affect. Based on Lawton's dual channel model of subjective well-being (1996), they hypothesized that objective and subjective measures of contact with friends and family and of activity participation would have a direct relationship with positive affect but not with negative affect. They also hypothesized that an objective measure of health would be related to negative affect but not to positive affect.

What the authors found when they tested the model in older adults was only partially what they had hypothesized. The results are summarized conceptually in Figure 3.

Figure 3

Conceptual model of quality of life and affect in older adults
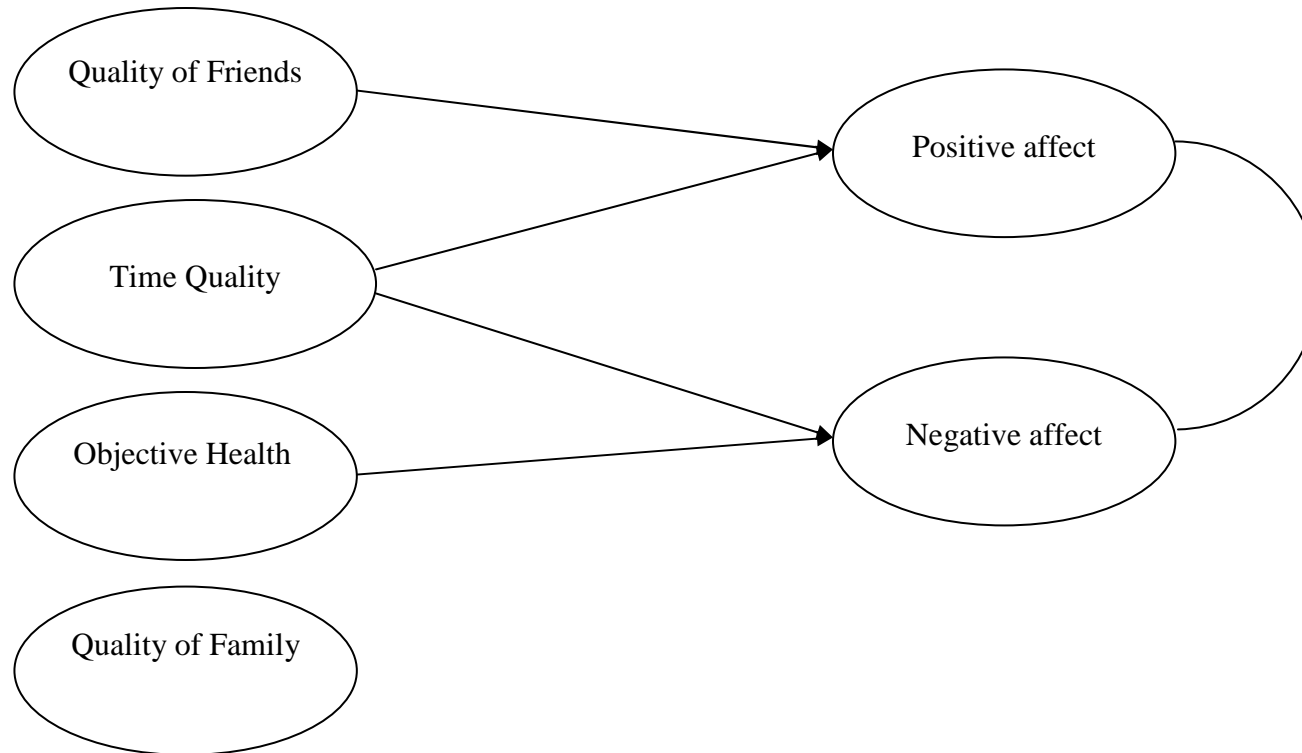
Note. Only direct relationships with the quality of life factors were hypothesized in the figure. It should be noted that it was believed the quality of life components would be intercorrelated with one another.

The relationship between objective health and negative affect was weak, a finding that is consistent with prior literature that finds only weak to moderate correlations between well-being and objective measures of health (Brief et al., 1993; Okun & George, 1984). None of the other objective measures, however, had strong direct relationships with either positive or negative affect; instead, only the subjective quality of life measures were related to well-being. The subjective measures of time quality and quality of friends had direct relationships with positive affect. Time quality, a construct measuring people's judgments about the quality of the things they do during the day, was related to negative affect as well. The dual relationship between the subjective measure of time quality and both positive and negative affect deviated from what the authors originally hypothesized. They hypothesized that time quality would have a relationship with positive affect but not with negative affect as per the dual channel hypothesis. They speculated, post hoc, that judgments of time quality may depend on both externally engaging phenomena like enjoyable daily activities and a more intraindividual phenomenon like self-efficacy.

These findings stress the importance of subjective rather than objective measures of the quality of different areas of one's life in relating them to well-being. In this project I will attempt to replicate and extend these findings. In addition to the subjective measures of satisfaction with friends, family, and time quality, I will include a subjective assessment of health, which was not included by Lawton et al. (1999). I will also assess environmental satisfaction. Prior research has found that the importance of the physical environment, particularly the home environment, increases as people age (Moss & Lawton, 1982; Oswald, Wahl, Martin, & Mollenkopf, 2003) and that this physical

environment can influence affective experience (Langer & Rodin, 1976). This revised conceptual model for the present project is shown in Figure 4.

One of the major purposes of the present investigation was to apply the model across the entire adult life span. Study 1 used a correlational approach to test the model based on responses to questionnaires administered to a community sample of people across the adult lifespan. In addition to the measures used previously to assess the model in older adults, Study 1 included an indirect measure of affect as an outcome variable and will examine the role of personality as an additional predictor variable.

In Study 2 an experimental approach was used to determine whether or not individuals aged 18 to 87 years report an increase in negative affect when environmental conditions are altered during their performance on a cognitive task. By conducting Study 2 any effects other than that of the objective environment were controlled, thereby maximizing the study's ability to detect any affective changes due to changing environmental conditions. Whereas Study 1 provided a naturalistic picture of the interrelationships between affect and how individuals perceive the various facets of their lives, Study 2 allowed a controlled look at the singular effect of objective environment on affective experience.

Hypotheses for Study 1

Overview

The theoretical model (Figure 4) of the relationship between subjective quality of life and well-being was tested using a causal modeling approach. Figure 4 specifies that different quality-of-life measures are related directly to either positive or negative affect. This project did not assess objective measures Lawton and colleagues (1999) used

primarily because they found no association between objective measures and well-being. What follows is the rationale for each of the different components of the model.

<div align="center">*Positive Affect*</div>

Friends

I hypothesized that satisfaction with friends is related positively to positive affect but not to negative affect.

Environment

I also hypothesized that environmental satisfaction is related positively to positive affect despite the sparse literature on the relation between the quality of an individual's environment and affect. Environmental satisfaction appears on the surface to be closely related to the type of externally engaging and rewarding phenomena that Lawton (1996) hypothesized to be related to positive rather than negative affect. Also, altering the physical environment, specifically a nursing home environment, by increasing feelings of choice and personal responsibility and control over daily events increased reports of happiness in elderly adults (Langer & Rodin, 1976). These results demonstrate the positive effects that perceived control over the environment can have and indirectly provide evidence for a relation between the physical environment and positive affect.

<div align="center">*Negative Affect*</div>

I hypothesized that the perceived quality of an individual's health is related strongly to negative affect but not to positive affect.

Positive and Negative Affect

Time quality was hypothesized to relate strongly to both positive and negative affect as it did in Lawton and colleagues' (1999) model of quality of life and affect in older adults.

No Relationship

Satisfaction with family relationships, although assessed, was hypothesized to be unrelated to positive and negative affect. Although family relationships are important, they are complex and may show no clear relation to either positive or negative affect as reported by Lawton et al. (1999).

Figure 4

Hypothesized model of quality of life and affect
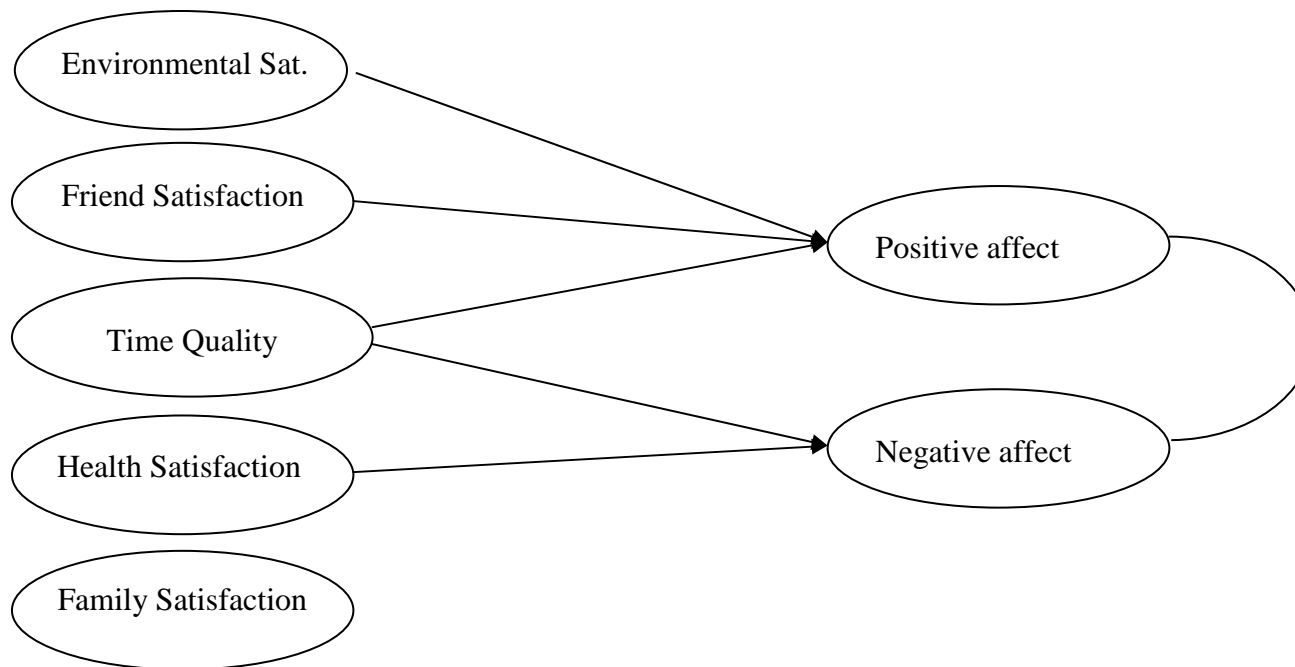
Note. Only direct relationships with the quality of life factors were hypothesized in the figure. It should be noted that it was believed the quality of life components would be intercorrelated with one another.

Indirect Measure of Affect

Prior research has indicated the potential reporting bias that accompanies self-report measures of well-being or affect states (Carp, 1989; Paulhus, Fridhandler, & Hayes, 1997; Paulhus & Morgan, 1997). Because of this I explored whether or not the model changes depending on the type of affective measurement used as the dependent variable. The confirmed model using the self-report measures of positive and negative affect (PANAS; Watson, Clark, & Tellegen, 1988) as the dependent variables was repeated using indirect measures of positive and negative affect (Johnson, 2003).

Personality

Watson (2000) showed that certain personality factors (Neuroticism) are related to negative affect alone, and others (Extraversion) are related only to positive affect. To explore the relationship between personality and both quality of life and affect, I conducted structural analyses looking at personality in two different ways as part of the model. The first model included personality as a precursor to affect similar to the quality-of-life indicators. This model assumes that personality involves stable traits that form early in adulthood and have some bearing on how individuals experience events and report positive and negative affective states. The second model explored whether or not there is an interaction between personality and quality of life, and whether this interaction has a direct effect on positive and negative affect.

Age

The present project expanded the previous model of quality of life and affect originally modeled in an older adult sample (Lawton et al., 1999) to include the entire

adult lifespan. The model in Figure 4 was tested as a structural equation model in the older adult sample; the best fitting older adult model was then tested in the younger adult sample to observe whether or not these relationships held across the entire adult lifespan.

<center>Hypotheses for Study 2</center>

As reviewed in the previous chapter, one aspect of Lawton's individual competency/environmental press model was the effect the objective environment has on an individual's affect. In Study 2 I attempted to capture this phenomenon in a laboratory setting. Individuals aged 18 to 87 ranked seven musical selections with regard to listening preference. They performed a demanding cognitive task in silence and also while listening to both their least and most preferred type of music. At the end of each listening condition they rated their positive and negative affect.

I hypothesized that participants of all ages would report greater negative affect when performing a cognitive task under nonpreferred environmental conditions compared with preferred environmental conditions.

CHAPTER 4: METHOD

Study 1

Participants

Following approval from the Institutional Review Board at Washington
University in St. Louis participants were recruited from two sources: the Volunteer for
Health program, a community-based program sponsored by the Barnes-Jewish Hospital
to match volunteers with current research projects, and the adult volunteer pool
maintained by the Aging and Development Program within the Department of
Psychology. The sample was supplemented by friends and members of the Department
of Psychology at Washington University in St. Louis.

The sample included 489 people ranging in age from 18 to 98 years ($M = 61.46$,
$SD = 19.66$). The sample was primarily female (71%), White (90%), and well-educated
($M = 15.75$ years, $SD = 4.3$). Because the primary goal of Study 1 was to replicate
Lawton et al.'s (1999) model of the relationships between quality of life and affect in
older adults, a large proportion (289 of the 489) of this sample was over the age of 60.
These 289 participants constituted the older adult sample. The older sample in the
present project consisted of fewer females and was slightly younger and well-educated
than the two older adult samples from Lawton and colleagues (1999) study. The
remaining 200 participants constituted the younger adult sample.

Measures

Demographic Variables

Participants reported their age, gender, ethnicity, and level of education within the
packet of questionnaires. All measures can be found in Appendix A. The means and

standard deviations for all total and/or component scores from the measures are displayed

in Appendix B.

Dependent Variables

      Direct self-report of affect. Participants' subjective emotional experience was

assessed by the Positive Affect/Negative Affect Schedule (PANAS; Watson et al., 1988).

The PANAS includes 10 items for positive affect and 10 items for negative affect. Each

item is an adjective that describes a particular emotion. Participants were instructed to

rate each adjective "to what extent do you feel this way at this moment." Participants

circled the answer choice that best described themselves on the five-item Likert scale (1,

very slightly or not at all; 2, *a little*; 3, *moderately*; 4, *quite a bit*; and 5, *extremely).*

Scores for the negative and positive affect subscales were computed by summing

participant ratings for all positive and all negative adjectives. Although widely used in

student samples, the PANAS has shown similar psychometric properties in nonstudent

samples (alpha reliabilities for the positive and negative affect scales of .86 and .87,

respectively, and a correlation between the two affect scales of -.09; Watson et al., 1988).

      Indirect measure of affect. Participants' affect was also assessed indirectly using

30 short vignettes describing common life experiences that evoke both positive (15

vignettes) and negative affect (15 vignettes; Johnson, 2003). Participants were asked to

put themselves in the place of the protagonist and to answer questions about the vignette.

All participants received the same vignettes; the gender of the protagonist, however, was

matched to the gender of the participant.

      For the 15 vignettes that elicit negative emotion, participants were asked how

angry or sad the protagonist felt (cognitive), how intense was the emotion experienced by

the protagonist (intensity), and how personally responsible did the protagonist feel for what happened (agency). Negative affect was best described as a three-dimensional construct (intensity, agency, and cognitive) using this indirect assessment method (Johnson, 2003).

For the 15 vignettes that elicit positive affect, participants responded to two questions that reflected perceived intensity (how excited or content do you believe the protagonist felt), and how lucky you feel the protagonist was (agency). All responses were made using a 5-point Likert rating scale although the meaning for each point along the 5-point Likert scales differed according to each question. Positive affect was best described as a two-dimensional construct (intensity and agency) using this indirect assessment method (Johnson, 2003).

Independent Variables

Personality. Participants' personality was assessed using the Mini International Personality Item Pool (Mini-IPIP; Donnellan, Oswald, Baird, & Lucas, 2006), a 20-item short form of the 50-item International Personality Item Pool-Five Factor Model measure (50-item IPIP; Goldberg, 1999). The 50-item IPIP was created as a publicly accessible, validated collection of personality items that measure personality according to the five factor model of trait-personality that could be used in place of the commercial NEO PI-R or NEO Five-Factor Inventory (Costa & McCrae, 1992). The Mini-IPIP was created to measure all five personality factors distinctly in a more time-efficient manner while still maintaining enough items per factor so the scale could be used in modeling procedures (Donnellan et al., 2006). The scale includes four items per factor (Neuroticism,

Extraversion, Conscientiousness, Intellect/Openness and Agreeableness) with an equal number of positively and negatively worded items per factor.

The Mini-IPIP has acceptable reliability coefficients (ranging from .65 to .77) and strong convergent correlations with the longer 50-item IPIP (ranging from .85 to .93). A confirmatory factor analysis of the Mini-IPIP showed strong factor loadings for an underlying five-factor model with all but one item loading on one factor with a magnitude greater than .50 ("I seldom feel blue" loaded .39 on the Neuroticism factor; Donnellan et al., 2006). Although the Mini-IPIP was constructed using multiple samples of only undergraduates, the five factor structure of the parent 50-item IPIP was shown to be stable across three successive age groups including an older adult sample, and the internal consistencies across the three groups were similar to those cited by (Gow, Whiteman, Pattie, & Deary, 2005). The brevity of the Mini-IPIP made it useful for this project, which asked participants to complete many questionnaires.

Quality of life: Family, friends, and time (Lawton et al., 1999). Subjective quality-of-life measures of the relationships with family, relationships with friends, and perceived time quality were created by Lawton and colleagues (1999) for their study investigating the relationships between quality of life and affect in older adults. As shown in Appendix A, family quality was assessed using the nine original questions; seven of these questions were positively phrased and loaded as a single factor (loadings of .40 or higher) in the original model (Lawton et al., 1999) with an internal consistency of .93. The two negatively phrased items did not load onto the original family quality factor. Friends quality was also assessed using nine items originally, seven of which were positively phrased questions with an internal consistency of .91 (again, the two

negatively phrased items did not load onto the single factor representing friends quality).

Time quality was assessed originally by seven questions, six of which had an internal

consistency of .68. Despite the fact that Lawton et al. (1999) used fewer than the total

number of items for their modeling procedures, for the sake of completeness the original

measures were included in their entirety in this study.

Health and environmental satisfaction.   Both health and environmental

satisfaction were measured using the World Health Organization Quality of Life-BREF

assessment tool (WHOQOL-BREF; The WHOQOL Group, 1998). The seven-item

Physical component assesses various aspects of people's satisfaction with how their

physical health affects their life. Issues relating to physical health and pain, medical

treatment, mobility, ability to perform daily tasks, and sleep are all assessed within this

component of the measure.

The eight-item Environmental component of the WHOQOL-BREF (1998)

assesses various aspects of people's satisfaction with how their environment affects their

life. The environmental issues related to the safety and health of an individual's

environment, the availability of information in the environment, the satisfaction with

financial standing in the environment, the availability of leisure activities in the

environment, and satisfaction with the availability of health services and the overall

conditions in the environment.

The other two components of the WHOQOL-BREF (Psychological, Social) were

also assessed, although they were not part of any of the hypotheses. Two general items,

one assessing general quality of life, one assessing general health satisfaction, were

included as part of the 26-item assessment measure. The latter item was included in the initial model with the other items assessing Physical quality of life (see Appendix A).

In a multicenter international study of 11,830 adults ranging in age from 12 to 97 years ($M = 45$, $SD = 16$), the WHOQOL-BREF demonstrated acceptable Cronbach α's (.82 for Physical, .81 for Psychological, .80 for Environmental, and .68 for Social) across the entire study sample (The WHOQOL Group, 2004). A four factor solution denoting the Physical, Psychological, Social, and Environmental components fit the data well in two separate studies (The WHOQOL Group, 1998, 2004). In a study of depressed older adults both the Physical and Psychological components were significantly correlated with the Geriatric Depression Scale (-.73 and -.83, respectively), as well as with the self-report of the number of physical symptoms the individual experienced (.67 and -.61, respectively) and overall self-rated health (-.59 and -.58, respectively; Naumann & Byrne, 2004).

Residential satisfaction. As a supplement to the Environmental component of the WHOQOL-BREF (1998), a measure assessing the quality of the physical environment was created with items compiled from two sources. The first source was the Neighborhood Assessment Questions, a part of the Pennsylvania Department of Aging Baseline Interview and was provided by L. Winter (personal communication, July 2, 2007) of the Center for Applied Research and Aging and Health at Thomas Jefferson University. It assessed people's general satisfaction, sense of safety, and attachment to the specific neighborhoods in which they lived. These questions were altered for the purpose of this project to assess these same aspects of a participant's home (i.e.,

dormitory, apartment, or house). Four questions assessed neighborhood satisfaction, and four questions assessed the participant's home satisfaction.

The second source of items was the Elderly Care Research Center Environmental Satisfaction Measure, which has been used to measure environmental satisfaction as part of a longitudinal study conducted at Case Western Reserve University. This measure was provided by E. Kahana (personal communication, July 10, 2007), the Director of the Elderly Care Research Center. Two items were extracted from this measure, one assessing satisfaction with the community and the other assessing satisfaction with the domicile in which the participant lived. Items from these two sources were combined to create a 10-item scale with 5 items measuring home satisfaction and 5 measuring neighborhood/community satisfaction. It should be noted that there is no psychometric information on these two measures and these should be considered more exploratory in nature as compared to the more well-researched instruments used in Study 1.

Procedure

Participants were contacted by telephone, e-mail, or mail and provided a description of the study. Those participants who gave verbal consent to participate were mailed questionnaires in a packet that also included an addressed, stamped envelope to return the packet after completion. They were instructed to complete each and every question and to mail the packet back to the investigator. Each packet was marked with a participant identification number, and participants were asked not to include their names on any of the questionnaires thereby assuring their anonymity. Those participants within the Department of Psychology could simply take the questionnaires from the Department of Psychology mail room and return them to the investigator's mailbox after completion.

A total of 416 participants completed the packets at home and received no financial payment for their participation. Individuals who participated in Study 2 (*n* = 72) completed the packet during their visit to the Aging and Development Laboratory in the Department of Psychology at Washington University in St. Louis. As mentioned in the Participants section of Study 2, these participants were paid $10 for their participation in the research project.

Study 2

Participants

Following approval from the Institutional Review Board at Washington University in St. Louis participants were recruited from the Volunteer for Health program, a community-based program sponsored by the Barnes-Jewish Hospital to match volunteers with current research projects, and the adult volunteer pool maintained by the Aging and Development Program in the Department of Psychology.

The sample included 72 people ranging in age from 18 to 87 years (*M* = 53.71, *SD* = 20.60). The sample was primarily female (68%), White (81%), and well educated (*M* = 15.50 years, *SD* = 2.69). Because Study 2 used a mixed model design with age as a between subjects variable, approximately 10 people from each age-decade were recruited. It should be noted, however, that two of the age decades contained little variability; 9 of the 10 youngest participants were undergraduates ranging in age from 18 to 22 years, and 9 of the 10 in their 80s ranged in age from 80 to 82 years.

Measures

Paced Auditory Serial Addition Task (PASAT; Lejuez, Kahler, & Brown, 2003). The cognitive task used in Study 2 was a serial addition task. Participants added a

visually presented number to the previous visually presented number and used the computer mouse to select the correct sum. They then suppressed the answer when the next number appeared so they could add it to the number that preceded it. For example, the correct answers to the number series 4, 7, 3, 2, 4 would be 11, 10, 5, and 6 (4 + 7 = 11, 7 + 3 = 10, 3 + 2 = 5, and 2 + 4 = 6). The original PASAT was created to assess information processing in patients with head trauma (Gronwall, 1977). Case reports and studies criticized the original PASAT because it produced elevated stress and significantly increased negative affective states following testing sessions (Holdwick & Wingenfield, 1999). Therefore it was modified into a computer task for use as a controlled laboratory stressor (Lejuez et al., 2003). As described next, it was further modified for this study to be used as a cognitively challenging experimental task for participants of all ages and all levels of computer acumen.

Level 1 in the current study was programmed so the latencies between the presentation of the numbers would take into account the slowing in processing speed that occurs with age (Cerella, 1985). All participants began Level 1 with an interitem latency of 5 s. The latency increased or decreased 0.5 s depending on the response (incorrect or correct, respectively) to each addition problem throughout the 4-min duration of Level 1. The beginning 5-s latency between presentations was the longest the program allowed. Following the completion of Level 1 participants answered subjective questions about their emotional state (see next section on *Positive Affect/Negative Affect Schedule*).

To increase task difficulty the Level 2 latency was programmed to be 0.25 s shorter than the individual's mean latency of Level 1. Level 2 continued for 4 min. Level 3 began after participants again answered subjective questions about their emotional

state. It too continued for 4 min at the same latency as Level 2. At the end of Level 3

participants once again completed subjective questions about their emotional state. The

length of the entire experimental serial addition task, including time for instructions, was

approximately 20 minutes.

Positive Affect/Negative Affect Schedule (PANAS; Watson et al., 1988).

Participants' subjective emotional experience was assessed with the same PANAS l used

in Study 1. Participants were instructed to rate each adjective "to what extent do you feel

this way at this moment." These adjectives were administered via computer during Study

2. Participants made their judgments by using the mouse to select one rating from the

five-point Likert scale (1, *very slightly or not at all;* 2, *a little*; 3, *moderately*; 4, *quite a*

bit; and 5, *extremely).*   Scores for the negative and positive affect subscales were

computed by summing participant ratings for all positive and all negative adjectives.

Procedure

After giving informed consent and answering basic demographic questions,

participants completed a packet of questionnaires about their personality, affective state,

and the quality of various aspects of their lives (see section on *Measures and Procedures*

from Study 1). Participants then sat in front of a computer and listened to seven 20-s

song clips via headphones. The selections were from a variety of different genres of

music (classical, country and western, rap, heavy metal, rhythm and blues, reggae, and

easy listening). See Appendix B for list of the specific selections. The recordings of all

seven selections were initially tested to remove any obvious differences in sound quality.

Participants were then asked to identify the song they most preferred and the

song they least preferred in terms of their own listening preferences. The volume of the

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music for the entire experiment was set by the participants to their most comfortable listening level while listening to a 20-s portion of the *Star Spangled Banner* prior to hearing the seven music selections. This volume level was maintained without adjustment for the remainder of the experiment.

After ranking the musical selections participants were read instructions for the PASAT. After they acknowledged comfort with the computer program, they completed all three levels of the PASAT.   Participants donned headphones and completed Level 1 in silence. They then completed the PANAS to describe their emotional state. Following this, participants completed Levels 2 and 3 of the PASAT. Half of the participants listened to their most preferred type of music while completing Level 2 and then their least preferred type of music while completing Level 3. The listening order was reversed for the other half of the sample.   Subjective measures of emotional states (i.e., the PANAS) were administered following the completion of Level 2 and then again after completion of Level 3. Participants were paid $10 and debriefed.

CHAPTER 5: RESULTS

Study 1

Overview

The purpose of Study 1 was threefold. The first purpose was to create the

simplest, best-fitting factors within both the older and younger adult groups to be used in

the structural equation models. The second purpose was to partially replicate the

structural models of Lawton and colleagues (1999) by evaluating the relationships

between subjective quality-of-life factors and affect within the older adult sample. Third,

both the models reported by Lawton and colleagues (1999) and the best-fitting older adult

model from the present study were tested in the younger adult sample to assess whether

or not these relationships are invariant, albeit using a cross-sectional approach, across the

adult lifespan.

Factor Analytic Models

Procedure

To build the factors to be used as the independent and dependent variables in the

structural models, I conducted a series of confirmatory factor analyses. The LISREL

statistical program (Version 8.72, Joreskog & Sorbom, 2005) was used to fit the models

to a covariance matrix using maximum likelihood estimation. The same program and

procedures were used to estimate the structural models in the subsequent sections of this

chapter.

Model fit for the confirmatory and structural models was assessed using a chi-

square goodness of fit test as well as the root-mean-square error of approximation

(RMSEA), the Bentler non-normed fit index (NNFI, Bentler & Bonett, 1980), and the

comparative fit index (CFI; Bentler, 1990). The null hypothesis for the chi-square test specifies that the model with the specified number of factors holds. With large samples, however, virtually any parsimonious model is rejected, and with a small sample model misfit may be undetected. Therefore, I relied primarily on the RMSEA, NNFI, and CFI to evaluate the fit of the factor and structural models. The RMSEA is an index of discrepancy between the model and the data per degree of freedom. An RMSEA value of less than .05 or .06 is usually considered indicative of close fit between the model and the data (Browne & Cudeck, 1993; Hu & Bentler, 1999). The NNFI indicates where the model lies on a continuum between two hypothetical models: a baseline model with unrelated observed variables and an ideal model that fits perfectly. The CFI compares the model with a baseline model. Hu and Bentler (1999) suggested that the NNFI and the CFI should be about .95 or greater to indicate good fit. It should be noted that in their article Hu and Bentler discuss the Tucker-Lewis Index (TLI) rather than the NNFI; both are identical fit indices, however, and the rules laid out in the article for the TLI apply for the NNFI as well.

I initially fit the models to the data for each confirmatory factor analyses based on the models derived from past research. For example, the 10-items from the PANAS that denote positive affect were forced to load together in the initial confirmatory factor analysis, likewise for the 10 negative affect items. In order to minimize the degrees of freedom used for estimating the structural equation model, only items that shared 40% of their variance with the common factor of interest were selected for use (with the exception of the Environmental quality factor which used a more liberal cut-off of $R^2 =$ .35). Using an R^2 of .40 as the cutoff is akin to limiting the models to items that reliably

measure the common factor of interest with an alpha coefficient of .63. Modification

indices were also used to improve the fit of each individual measurement model. The

correlated errors suggested by the statistical program were only used if they significantly

improved fit and made good theoretical sense. The new models were then refit to the

data.

This procedure created the most parsimonious factors for Positive and Negative

affect, Environmental quality, Physical Health quality, Friends and Family quality, and

Time quality. These initial confirmatory factor analyses were done separately in the

older adult sample (individuals age 60 years and older) and the younger adult sample

because similarities and differences between the two age groups would be theoretically

meaningful. It again should be noted that the purpose of this initial modeling procedure

was to create the most parsimonious factors to be used in the structural equation models

while minimizing the degrees of freedom needed to estimate each factor.

Factor Models

The best-fitting factor models and global fit statistics for these models are

provided in Table 1 for both the younger and older adult samples. None of the baseline

models based on prior research adequately fit the data in either the younger or older adult

groups. Table 1 includes all the items that past research has shown measure the factor of

interest as well as the items that constituted the best-fitting factor in this present study,

shown in bold.

Table 1

Global Fit Indices for Variables used in Structural Equation Models in Study 1

Measure	Initial items	Global model fit indices				
		χ^2	*df*	RMSEA	NNFI	CFI
Older adults (n = 289)						
Positive affect	1, 3, 5, **9**, **10**, **12**, **14**, **16**, **17**, **19** [a]	87.27 **	51	.050	.98	.98
Negative affect	**2**, **4**, 6, **7**, 8, 11, 13, **15**, 18, **20** [a]	87.27 **	51	.050	.98	.98
Physical health	**2**, **3**, 4, **10**, **15**, 16, **17**, **18** [b]	10.40 *	8	.032	1.00	1.00
Family	**1**, 2, 3, 4, 5, 6, **7**, **8**, **9** [c]	6.12 *	2	.085	.98	.98
Friends	**1**, 2, **3**, 4, **5**, **6**, 7, 8, **9** [d]	17.30 *	13	.034	1.00	1.00
Time	1, **2**, **3**, 4, **5**, **6**, 7 [e]	3.68 *	3	.028	1.00	1.00
Environmental	**8**, **9**, 12, **13**, 14, 23, 24, **25** [b]	10.82 *	4	.077	.96	.98
Younger adults (n = 200)						
Positive affect	1, **3**, 5, **9**, **10**, 12, **14**, **16**, **17**, **19** [a]	67.27 **	42	.055	.98	.98
Negative affect	2, **4**, 6, **7**, 8, 11, 13, **15**, 18, **20** [a]	67.27 **	42	.055	.98	.98
Physical health	**2**, 3, 4, **10**, **15**, 16, **17**, **18** [b]	11.06	5	.078	.98	.99
Family	**1**, 2, **3**, 4, **5**, **6**, **7**, **8**, **9** [c]	29.26 **	14	.074	.99	.99
Friends	**1**, 2, **3**, 4, **5**, **6**, **7**, **8**, **9** [d]	30.02 **	14	.076	.99	.99
Time		No model fit				
Environmental	**8**, **9**, **12**, **13**, 14, **23**, **24**, 25 [b]	5.75	9	.000	1.00	1.00

Note. *a* items from the PANAS; *b* items from the WHOQOL-BREF; *c* items from the Family Quality measure; *d* items from the Friends quality measure; *e* items from the Time quality measure; items in **Bold** denote items used in best-fitting model; RMSEA = root-mean-square errors of approximation; NNFI = non-normed fit index; CFI = comparative fit index.

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

Figures 5 through 10 include the factor loadings, error variances, correlated errors, and, for Positive and Negative Affect, the correlation among the factors for all of the best-fitting measurement models for both the younger and older adult samples. Only four individual factor loadings had a magnitude of less than .40: two items loading on Negative Affect in the older adult sample, Item 7 (*scared*; .30) and Item 20 (*nervous*; .31) from the PANAS, one item loading on Friends quality in the older adult sample (Item 8, *How well do you and your friends get along?*, .35), and one item from the WHOQOL-BREF loading on Environmental quality in the older adult sample (Item 8, *How safe do you feel in your daily life?, .34*). The remaining factor loadings were all greater than .40.

Figure 5

Factor Loadings, Error Variances, Correlated Errors, and Factor Correlations for the Best Fitting Measurement Models for Positive and Negative Affect in Older and Younger Adult Samples as Measured by the PANAS
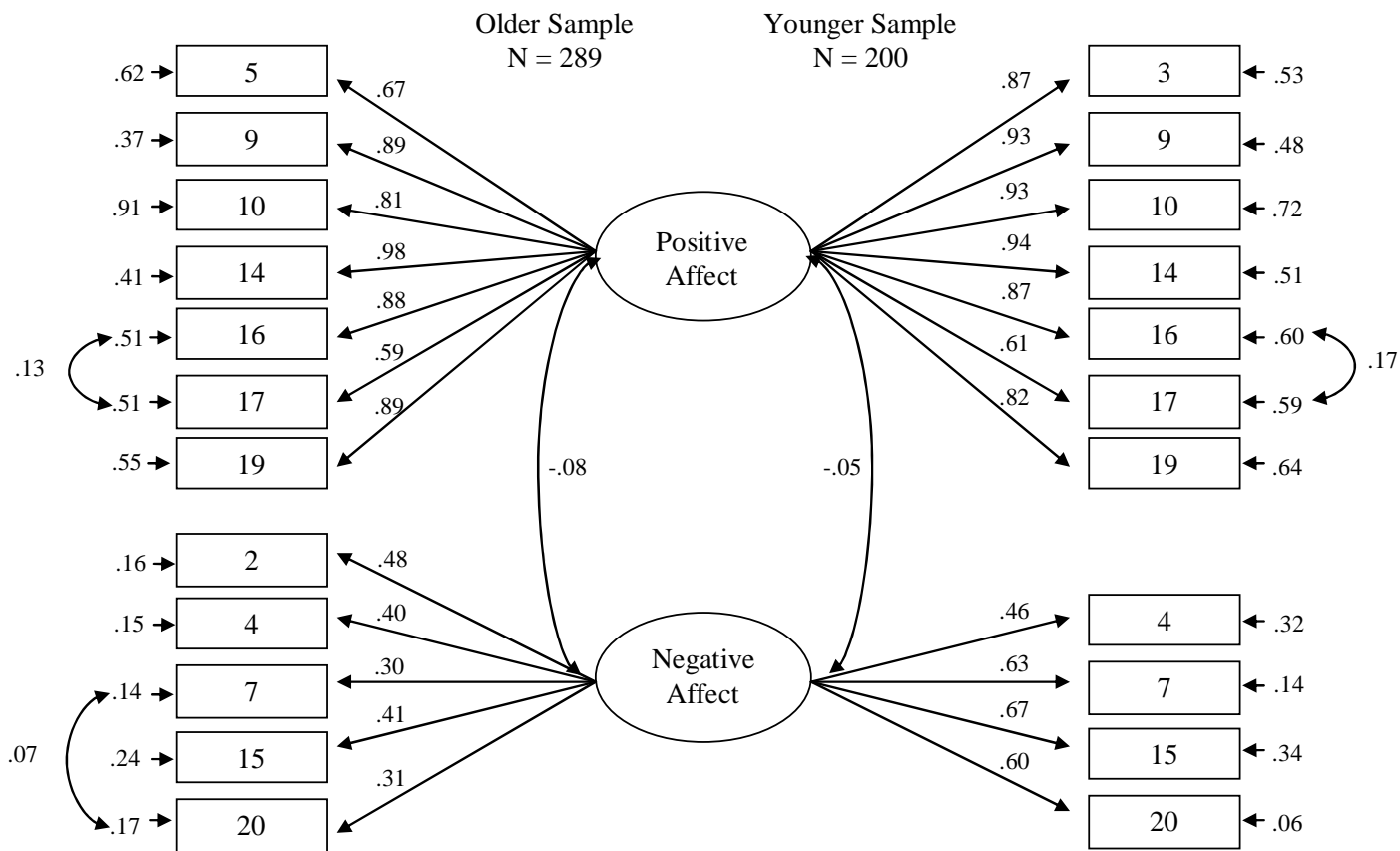
Figure 6

Factor Loadings, Error Variances, and Correlated Errors for the Best Fitting Measurement Models for Friends Quality in Older and

Younger Adult Samples as Measured by Items from the Friends Quality of Life Measurement
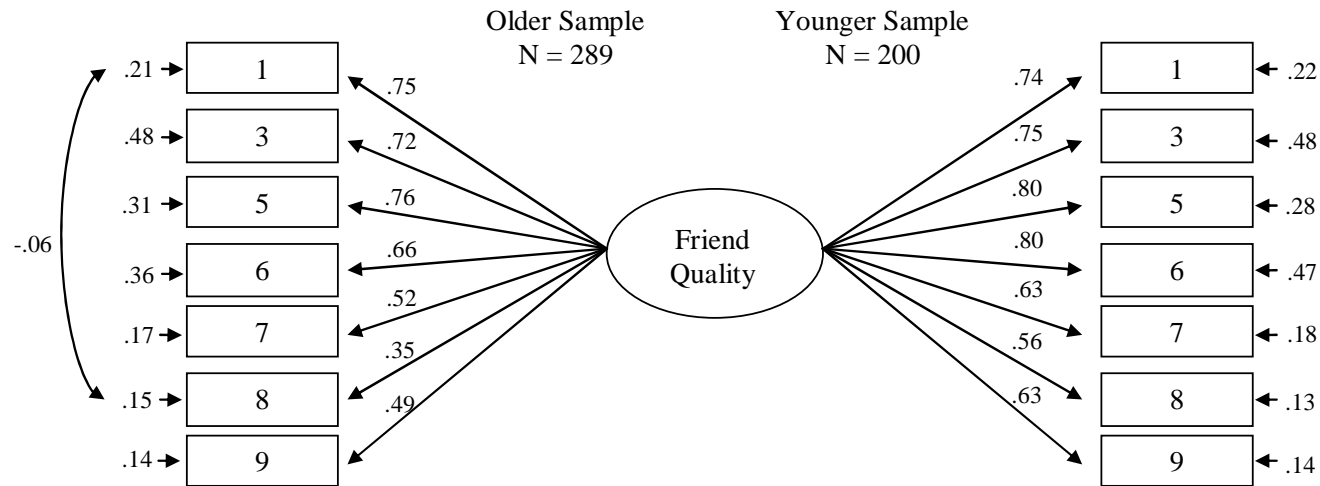
Figure 7

Factor Loadings and Error Variances for the Best Fitting Measurement Models for Family Quality in Older and Younger Adult

Samples as Measured by items from the Family Quality of Life Measurement
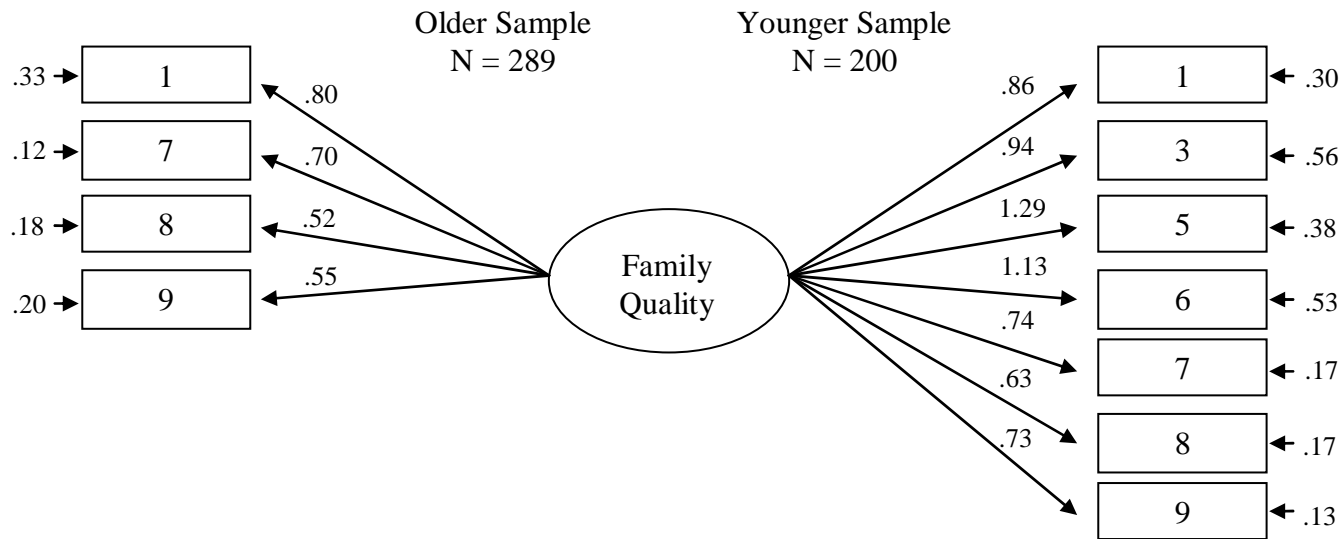
Figure 8

Factor Loadings, Error Variances, and Correlated Errors for the Best Fitting Measurement Models for Time Quality in the Older

Adult Sample as Measured by Items from the Time Quality of Life Measurement
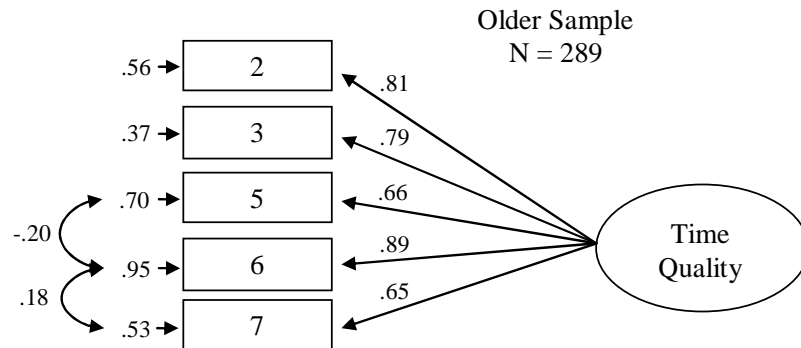
Figure 9

Factor Loadings, Error Variances, and Correlated Errors for the Best Fitting Measurement Models for Physical Health Quality in

Older and Younger Adult Samples as Measured by Items from the WHOQOL-BREF
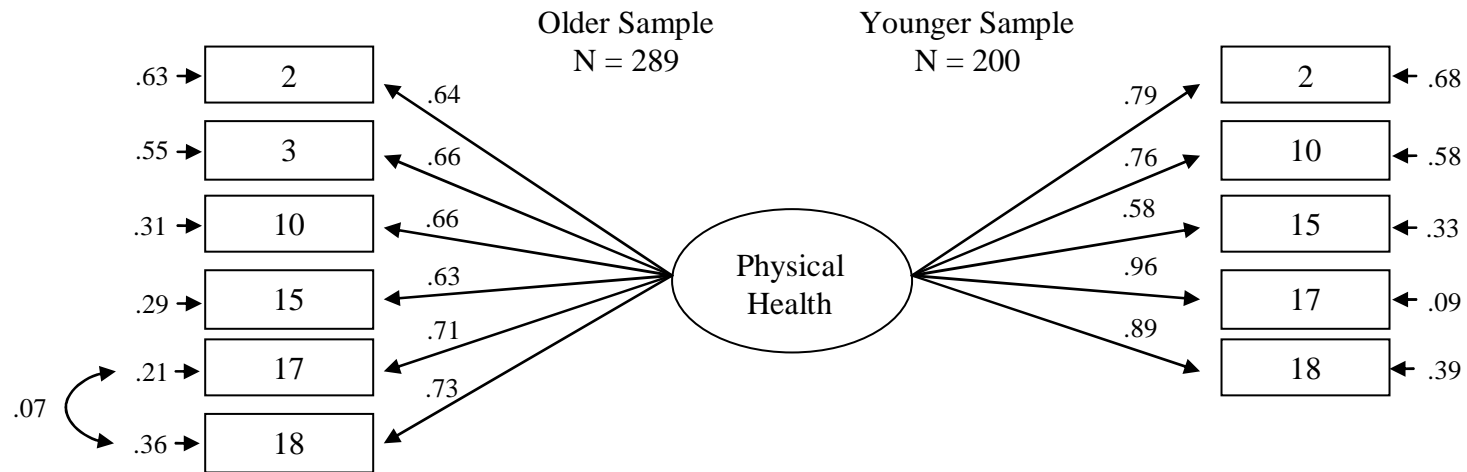
Figure 10

Factor Loadings, Error Variances, and Correlated Errors for the Best Fitting Measurement Models for Environmental Quality in

Older and Younger Adult Samples as Measured by Items from the WHOQOL-BREF
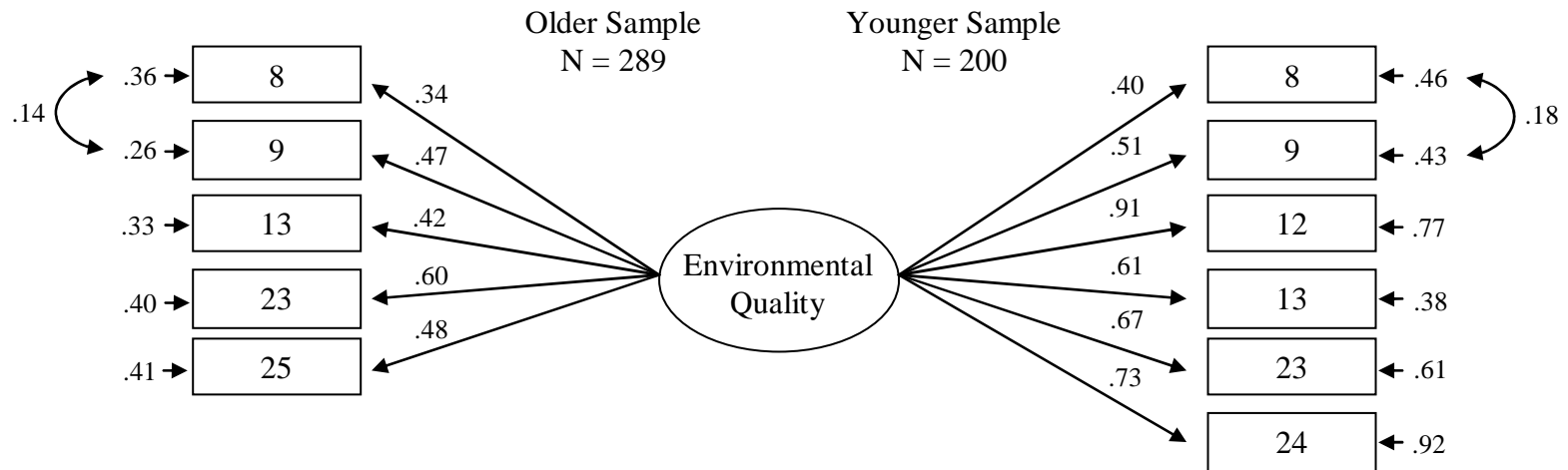
In most cases the differences between the older and younger samples for what constituted the best-fitting factors were minor. As can be seen in Figure 5, Positive Affect was nearly identical among the two samples, the only difference being Item 5 from the PANAS (*strong*) loaded strongly in the older adult sample whereas Item 3 from the PANAS (*excited*) loaded strongly in the younger adult sample. Item 2 (*distressed*) loaded strongly on Negative Affect in the older adult sample but did not in the younger adult sample. The Positive and Negative Affect factors derived in the present study overlap significantly with a previously published short form of the PANAS made up of five items per factor (Mackinnon, Jorm, Christensen, Korten, Jacomb, & Rodgers, 1999). Four of the five items for Negative Affect and three of the five items for Positive Affect were replicated in both samples in the present project.

The Friend quality factor was nearly identical between the two samples with a correlated error between items 1 and 8 in the older adult sample being the only difference (Figure 6).   The Family quality factor was different for the two samples; the Family factor included only four items in the older adult sample but seven items in the younger adult sample (Figure 7). It should be noted that for both the Friend and Family quality factors, as in the study by Lawton and colleagues (1999), the two negatively phrased items (2 and 4 in both the Family and Friends measures) did not load with the rest of the items from the measures.

The most significant difference between the best-fitting models for the older and younger samples was for the Time quality factor (Figure 8); a factor was not achieved in the younger adult sample. This measure was originally created for older adults and may not assess much beyond the notion of boredom in younger adults.

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The Physical Health factors were similar across both samples. The only difference was that Item 3 from the WHOQOL-BREF (*To what extent do you feel that physical pain prevents you from doing what you need to do?*) loaded on the Physical Health factor in the older adult sample but not in the younger adult sample (Figure 9). Otherwise the Physical Health factor in both samples included items addressing general satisfaction with physical health (Item 2), energy levels (Item 10), mobility (Item 15), ability to perform daily tasks (Item 17), and satisfaction with capacity for work (Item 18).

The Environmental quality factor in both samples addressed how safe (Item 8) and healthy (Item 9) the participants' environments were, as well as how readily available information was within the participants' environment (Item 13) and how satisfied participants were in their living conditions (Item 23). There were, however, differences between the two groups (Figure 10). How satisfied they were with their methods of transportation was an important aspect of the older adults' Environmental quality (Item 25), whereas younger adults' satisfaction with their finances (Item 12) and access to health services (Item 24) constituted important aspects of their Environmental quality.

Structural Models

Older Adults

Self-reported affect (PANAS). I conducted a series of structural equation models using the data from the older adult sample to evaluate the relationships hypothesized in Chapter 3. Model fit statistics are given in Table 2.

Table 2

Global Fit Indices for the Structural Models Assessing the Relationships between Quality of Life and Affect as Measured by the PANAS in the Older Adult Sample

	Global model fit indices					
Model	χ^2	*df*	RMSEA	RMSEA 90% CI	NNFI	CFI
1	1011.92**	678	.041	.036 - .047	.97	.97
2	785.79**	542	.040	.033 - .045	.97	.98
3	553.18**	337	.047	.040 - .054	.97	.97
4	786.22**	544	.039	.033 - .045	.97	.98

Note. RMSEA = root-mean-square errors of approximation; NNFI = non-normed fit index; CFI = comparative fit index.

** $p < .0001$.

Model 1 followed the findings of Lawton and colleagues (1999) by regressing all *interpersonal* quality-of-life factors (Friends and Environment) on Positive Affect, all *intrapersonal* quality-of-life factors (Physical Health) on Negative Affect, and Time quality on both Positive and Negative Affect. Family quality, previously found to have no relationship with either Positive or Negative Affect (Lawton et al., 1999), was included in this initial model in an attempt to replicate those findings. As seen in Table 1, the overall fit for Model 1 was good, $\chi^2(678) = 1011.92$, $p < .0001$, RMSEA = .041 (90% CI, .036 - .047), NNFI = .97, CFI = .97. The structural loadings, interfactor correlations, and error variances are shown in Figure 11. As hypothesized, Family quality did not have a significant relationship with either Positive or Negative Affect.

Model 2 included the same relationships from Model 1 with Family quality omitted from the model. This model also fit the data well, $\chi^2(678) = 785.79$, $p < .0001$, RMSEA = .040 (90% CI, .033 - .045), NNFI = .97, CFI = .98. As shown in Figure 12, all relationships specified in the model were significant with the exception of the relation of Friends quality with Positive Affect (.03). Thus, Model 3, including the same relationships but omitting Friends quality was examined (Figure 13). As shown in Table 2, this model fit the data well, $\chi^2(337) = 553.18$, $p < .0001$, RMSEA = .047 (90% CI, .040 - .054), NNFI = .97, CFI = .97.

Figure 11

Structural Loadings, Error Variances, and Correlations among the Factors for the Model 1 Structural Relationships between Quality

of Life and Affect in an Older Adult Sample
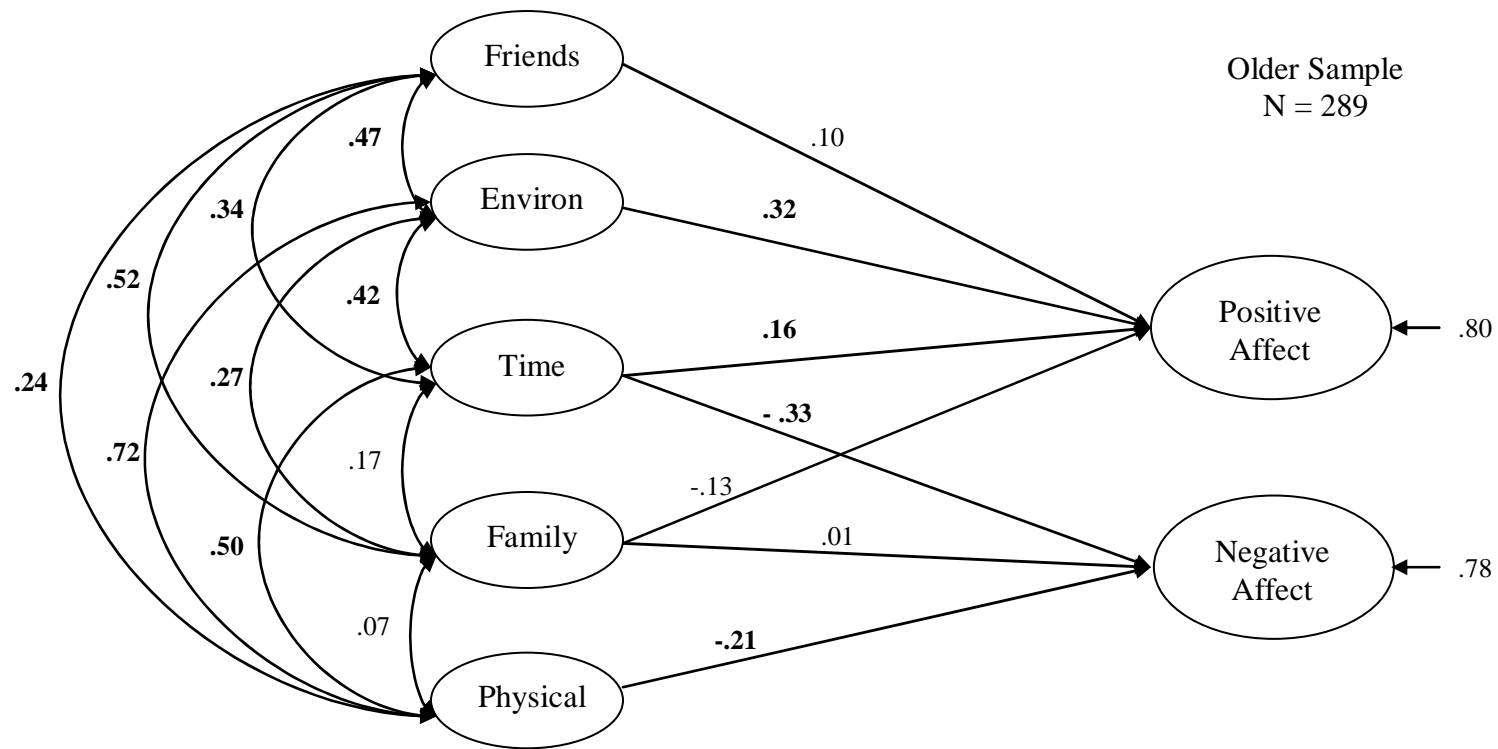
Note. **Bold** denotes significant correlations and factor loadings.

Figure 12

Structural Loadings, Error Variances, and Correlations among the Factors for the Model 2 Structural Relationships between Quality of Life and Affect in an Older Adult Sample
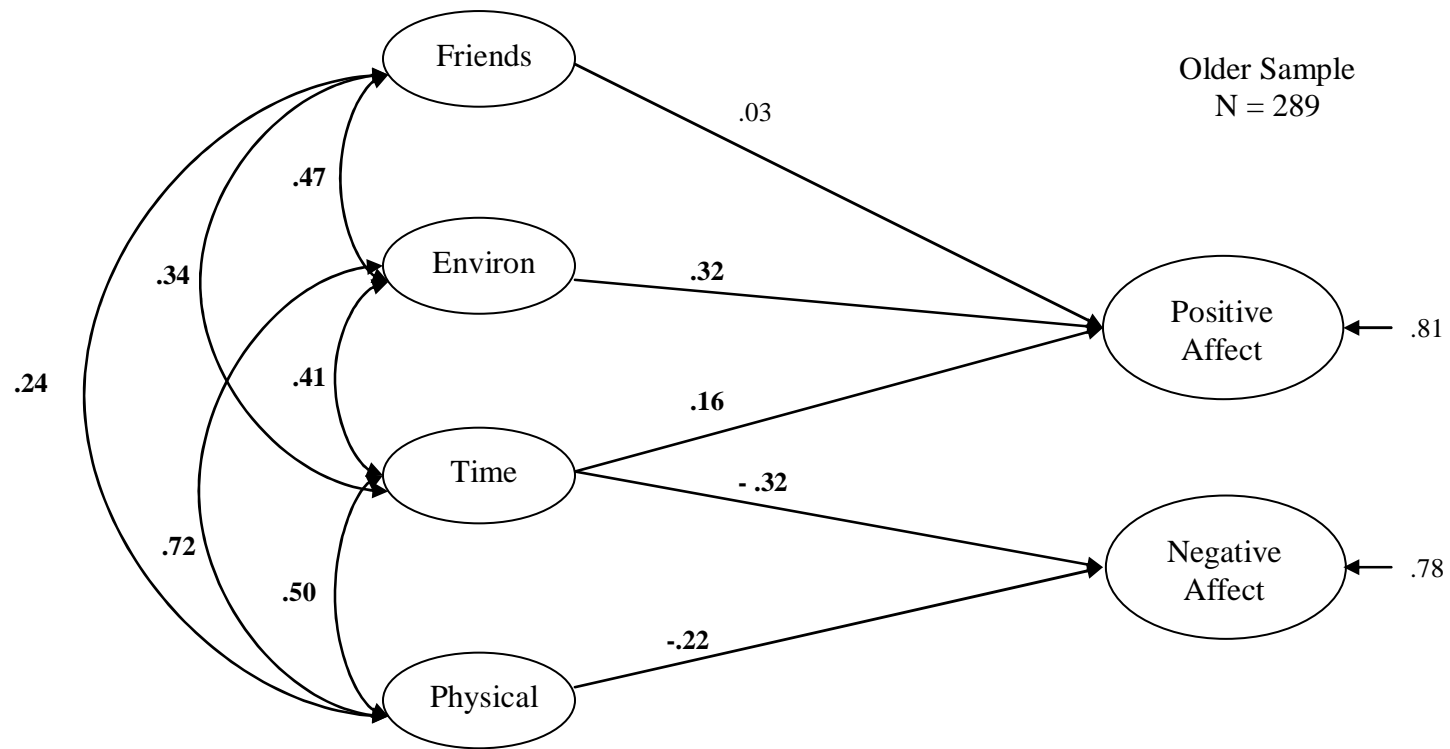
Note. **Bold** denotes significant correlations and factor loadings.

Figure 13

Structural Loadings, Error Variances, and Correlations among the Factors for the Model 3 Structural Relationships between Quality of Life and Affect in an Older Adult Sample

Not
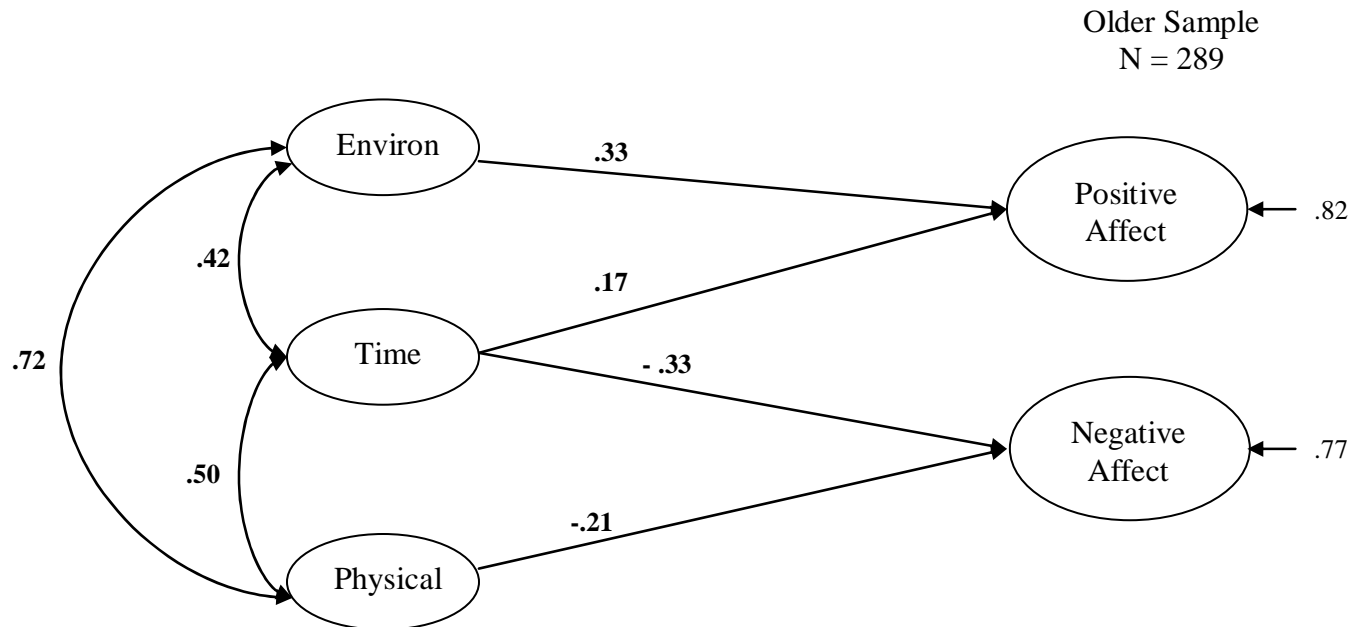
e. **Bold** denotes significant correlations and factor loadings.

These analyses partially replicated the relationships found by Lawton et al.

(1999). The quality of an older adult's physical health strongly predicted Negative Affect

but had no direct affect on Positive Affect. The quality of an older adult's time predicted

both Positive and Negative Affect. Expanding the model to include a measure of

environmental quality, the quality of an older adult's environment strongly predicted

Positive Affect but had no relationship with Negative Affect as predicted in Chapter 3.

As can be seen in Figures 11 through 13, however, these relationships explained only 18

to 23% of the variance in the dependent variables.

Surprisingly the quality of an older adult's friendships had no significant direct

relationship with Positive Affect, counter to both Lawton et al.'s findings (1999) and the

present study's hypotheses. Two aspects of one's life that become increasingly important

with age are the quality of one's physical health and the quality of one's relationships.

Therefore, the effects that these two components of quality of life have on the other

independent and dependent variables were explored further. Knowing the import of these

quality-of-life indicators and observing the strong interfactor correlations between

Physical Health and both Time quality (.50) and Environmental quality (.72) as well as

between Friends and both Environmental quality (.47) and Time quality (.34), I

conducted another structural analysis, Model 4, a Physical/Social Model of Affect. As

shown in Table 2, Model 4 fit the data well, $\chi^2(544) = 786.22$, $p < .0001$, RMSEA = .039

(90% CI, .033 - .045), NNFI = .97, CFI = .98.

The quality of an older adult's friendships and physical health were significantly

related to the quality of their time (explaining 30% of the variance in Time quality) and

environment (explaining 61% of the variance in Environmental quality; see Figure 14).

Figure 14

Structural Loadings, Error Variances, and Correlations among the Factors for the Model 4 Structural Relationships between Quality

of Life and Affect in an Older Adult Sample

Not
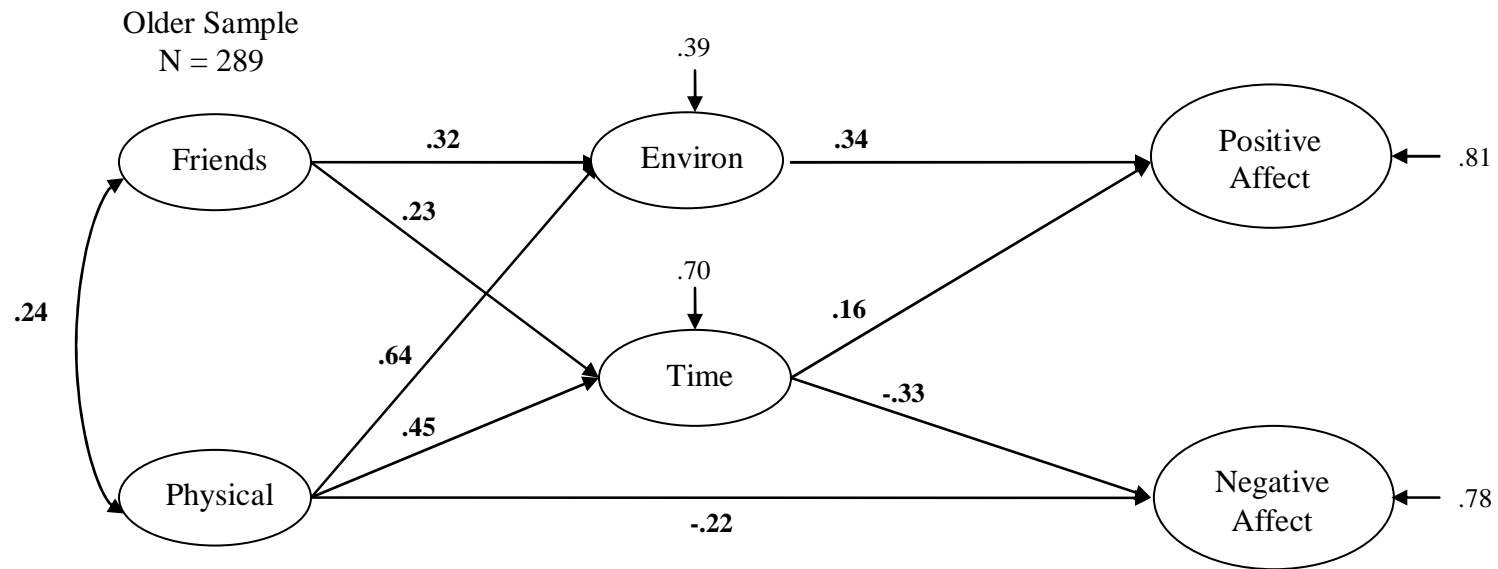
e. **Bold** denotes significant correlations and factor loadings.

Environment was significantly related to Positive Affect and Time quality was significantly related to both Positive and Negative Affect as specified in the earlier models. Physical Health also maintained its significant direct negative relationship with Negative Affect.

Indirect measure of affects. I conducted a confirmatory factor analysis using the positive and negative affect intensity items from the SNAPAP (Johnson, 2003) for the purpose of creating two new dependent variables to be used in the structural models: a positive intensity and a negative intensity affect factor. I simultaneously fit the negative and positive intensity items to the data using maximum likelihood estimation. The measurement model fit the data reasonably well, $\chi^2(376) = 693.08$, $p < .0001$, RMSEA = .052 (90% CI, .046 - .059), NNFI = .90, CFI = .91. No items among the 15 negative intensity and 15 positive intensity items however shared 40% of the variance with the corresponding factor; in fact, only 5 negative intensity and 1 positive intensity items shared at least 30% of the variance with the negative and positive intensity factors. Using only six items with alpha coefficients of .55 to measure the latent factors is unacceptable for factor analytic purposes. For this reason, no structural model was extracted using the indirect measure of affect as the dependent variable.

Personality. Prior research has shown a strong connection between Neuroticism and Negative Affect and between Extraversion and Positive Affect (Watson et al., 1988). For this reason, only these two personality factors from the Mini IPIP were used in these exploratory analyses.

I conducted a confirmatory factor analysis including the four items for Extraversion (Items 1, 6, 11, and 16) and the four items for Neuroticism (Items 4, 9, 14,

and 19). The model fit the data adequately, $\chi^2(19) = 44.78$, $p < .001$, RMSEA = .069

(90% CI, .043 - .095), NNFI = .93, CFI = .96. The modification indices suggested

correlating the error between Items 14 (*I get upset easily*) and 19 (*I seldom get blue*).

Because the personality analyses were exploratory and the number of items per factor

was limited using the Mini-IPIP, this modification was implemented. After doing so, the

overall fit of the measurement model improved, $\chi^2(18) = 33.30$, $p < .05$, RMSEA = .054

(90% CI, .023 - .083), NNFI = .96, CFI = .97 (this model significantly improved the fit of

the previous model, $\chi^2\Delta(1) = 11.48$, $p < .0001$). All eight items measured the

corresponding factor with an alpha coefficient of .55 or greater (R^2 = .30 or greater with

the corresponding factor) with the exception of Item 9 (alpha coefficient of .49, R^2 = .24;

I am relaxed most of the time) with Neuroticism. I retained the item in the structural

analysis, however, because of the small number of items per factor. The factor loadings,

error variances, correlation among the factors, and correlated errors are displayed in

Figure 15. Although the low reliability coefficients and large error variances are not

ideal for modeling procedures, I conducted structural analyses including personality in

the model because these analyses were exploratory in nature.

The global fit statistics for three models including personality measures are given

in Table 3. The first model is the simplest, specifying just that Extraversion predicts

Positive Affect and Neuroticism predicts Negative Affect. It fit the data well, $\chi^2(164) =$

260.46, $p < .0001$, RMSEA = .045 (90% CI, .035 - .055), NNFI = .97, CFI = .97. As

shown in Figure 16, Neuroticism accounted for 30% of the variance in Negative Affect,

and Extraversion accounted for 10% of the variance in Positive Affect.

Table 3

Global Fit Indices for the Structural Models Assessing the Relationships between

Personality, Quality of Life, and Affect in the Older Adult Sample

	Global model fit indices					
Model	χ^2	*df*	RMSEA	RMSEA 90% CI	NNFI	CFI
Personality 1	260.46**	164	.045	.035 - .055	.97	.97
Personality 2	946.05**	571	.048	.042 - .053	.96	.96
Personality 3	1279.70**	836	.043	.038 - .048	.96	.97

Note. RMSEA = root-mean-square errors of approximation; NNFI = non-normed fit index; CFI = comparative fit index.

** $p < .0001$.

Figure 15

Factor Loadings, Error Variances, Correlated Errors, and Correlation Among the Factors for the Best Fitting Measurement Model

for Trait Personality in the Older Adult Sample as Measured by Items from the Mini IPIP
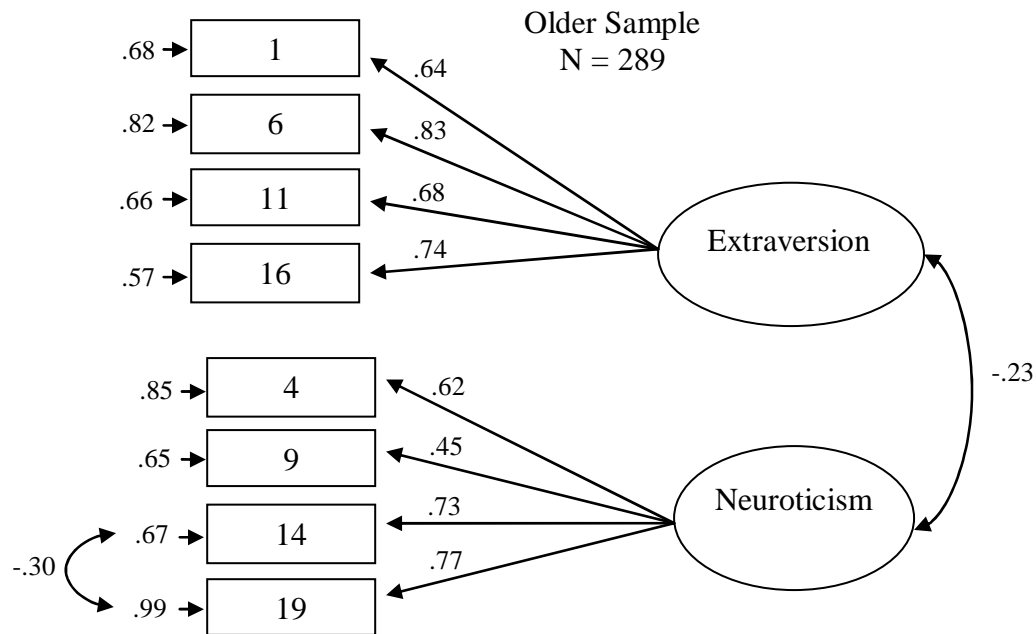
Figure 16

Structural Loadings, Error Variances, and Correlations among the Factors for the Personality 1 Structural Relationships between

Personality and Affect in an Older Adult Sample
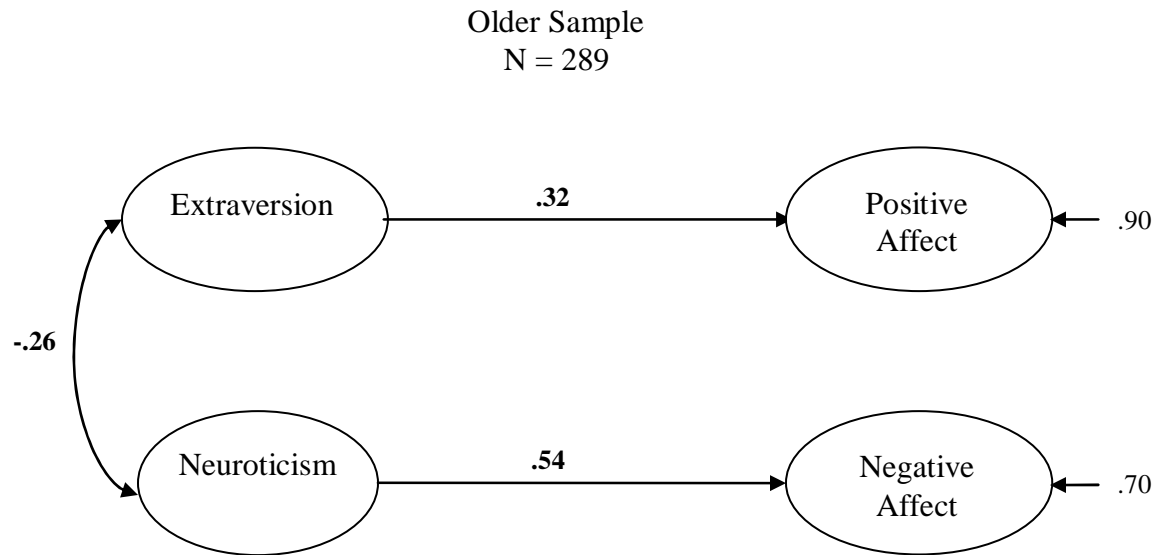
Note. **Bold** denotes significant correlations and factor loadings.

Personality 2 expanded Model 3 from the primary analyses by including a pathway from Extraversion to Positive Affect and Neuroticism to Negative Affect. It also fit the data well, $\chi^2(571) = 946.05$, $p < .0001$, RMSEA = .048 (90% CI, .042 - .053), NNFI = .96, CFI = .96. The addition of the personality factors altered the significance of some of the relationships between quality of life and affect from Model 3 of the primary analyses. As shown in Figure 17, the addition of Neuroticism improved the proportion of explained variance in Negative Affect from 23% (Figure 13) to 33% and eliminated the significant relations of both Time quality and Physical Health with Negative Affect. The addition of Extraversion to the model did not affect the strength of the relations of either Environmental or Time quality with Positive Affect but did explain another 6% of the variance in Positive Affect as compared with Model 3 from the primary analysis.

Personality 3 expanded Model 4 of the primary analyses by including a pathway from Extraversion to Positive Affect and from Neuroticism to Negative Affect. It, too, fit the data well, $\chi^2(836) = 1279.70$, $p < .0001$, RMSEA = .043 (90% CI, .038 - .048), NNFI = .96, CFI = .97. As shown in Figure 18, the addition of the personality factors, in particular Neuroticism, altered the significance of other relationships from Model 4 in the primary analyses. The significant relationship between Physical Health and Negative Affect was nonsignificant with the inclusion of the direct relationship between Neuroticism and Negative Affect. The inclusion of the effects of personality accounted for 5% more variance in Positive Affect and 6% more variance in Negative Affect compared with Model 4 from the primary analyses.

Figure 17

Structural Loadings, Error Variances, and Correlations among the Factors for the Personality 2 Structural Relationships between

Personality, Quality of Life and Affect in an Older Adult Sample
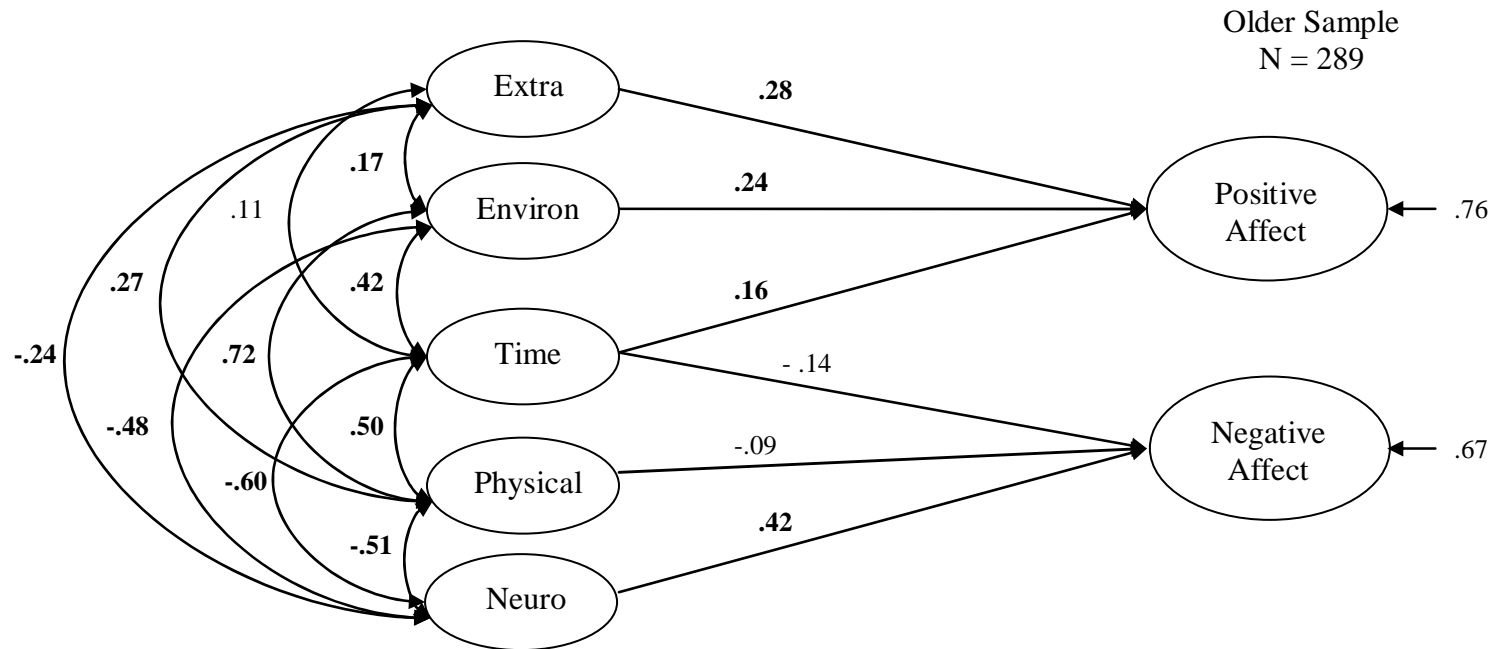
Note. **Bold** denotes significant correlations and factor loadings.

Figure 18

Structural Loadings, Error Variances, and Correlations among the Factors for the Personality 3 Model Structural Relationships

between Personality, Quality of Life and Affect in an Older Adult Sample
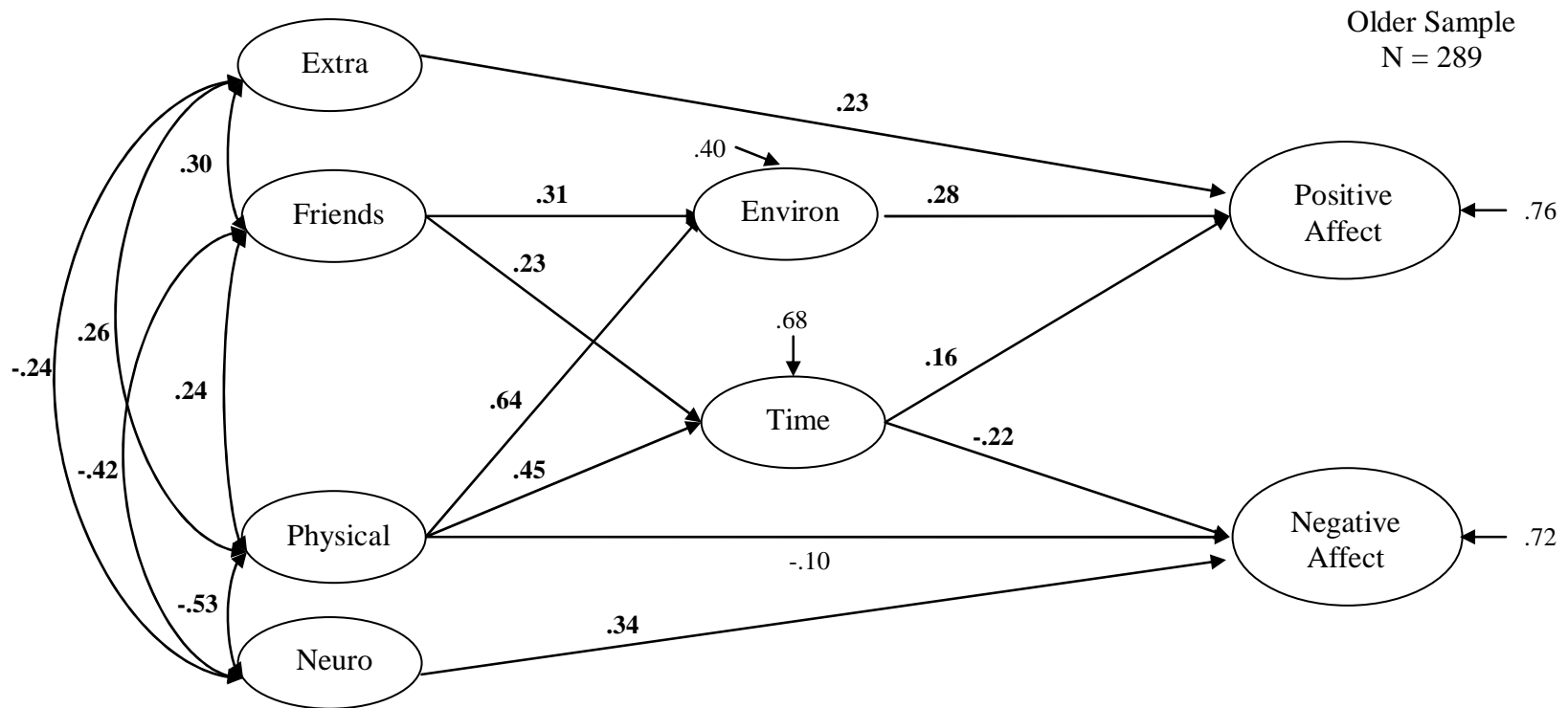
Note. **Bold** denotes significant correlations and factor loadings.

Finally, I explored whether an interaction between people's personality and their quality of life predicted Positive and Negative Affect by using latent variable interaction modeling (Schumaker, 2002). I extracted factor scores for each component of the structural model (personality, each quality-of-life component, and affect) using LISREL. I then conducted two series of hierarchical regression analyses using these factor scores. In one series I regressed the main effects of Neuroticism, Time, and Physical Health as well as the two- and three-way interactions between them on Negative Affect. In the second series I regressed the main effects of Extraversion, Time quality, and Environmental quality as well as the two- and three-way interactions between them on Positive Affect. These analyses were conducted using SPSS Version 15.0.

In the first hierarchical analysis in the series examining possible interactions involving Neuroticism the main effects of Time, Physical Health, and Neuroticism were entered at the first step, the three two-way interactions at the second step, and the three-way interaction at the third step. The increment in the R^2 at the third step was not significant, $F(1, 275) = .53, p < .50$. The increment in the R^2 at the second step was significant, $F(3, 276) = 4.16, p < .01$.

Three hierarchical analyses were then conducted to explore the effects of each two-way interaction individually. For each of these hierarchical regressions, the three main effects were entered at the first step, and the two-way interaction was entered at the second step. In the first of these analyses the Physical Health x Time interaction accounted for 3% of the variance in Negative Affect, $F(1, 278) = 10.31, p < .01$ (Table 4). The simple effects regression lines for people with high, medium, and low levels of physical health are shown in Figure 19.

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Table 4

Summary of Regression Analysis Predicting Negative Affect Factor Scores Including the

Time by Physical Health Interaction

Variable	B	$SE\ B$	β	ΔR^2
Step 1				.21 **
Time	-0.18	.06	-.18 **	
Physical Health	-0.14	.06	-.14 *	
Neuroticism	0.27	.06	.27 **	
Step 2				.03 *
Time	-0.11	.07	-.11	
Physical Health	-0.09	.06	-.09	
Neuroticism	0.29	.06	.29 **	
Time x Physical Health	0.14	.04	.19 **	

Note. The constant was -0.01, ($SE = .05$) in Step 1, and -0.08, ($SE = .06$) in Step 2;

neither was significant.

　　*p < .05. **p < .01.*

Figure 19

Regression Lines Depicting the Effect of Time on Negative Affect at Different Levels of

Physical Health Satisfaction
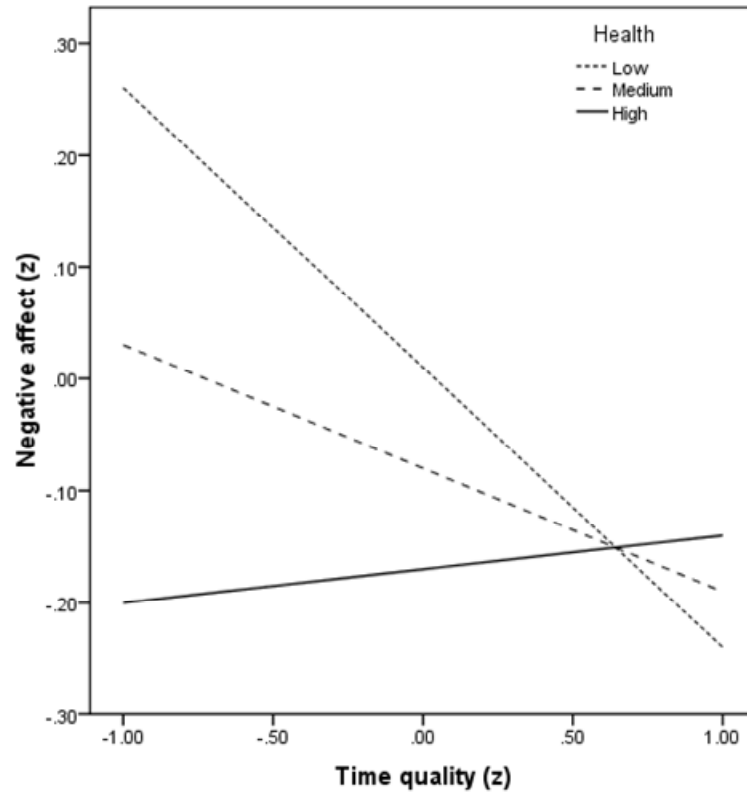
These effects assume an average amount of Neuroticism which was not included in the interaction. As shown in Figure 19, the effect of time quality on negative affect is dependent on how older adults perceive their physical health. If older adults perceive their physical health as high in quality, they experience low levels of negative affect regardless of the quality of their daily activities. The worse off the older adults health is perceived, however, the stronger the negative relationship between time quality and negative affect; that is, those older adults with low quality of physical health and low time quality experience high levels of negative affect.

In the second of these analyses the Neuroticism x Time interaction accounted for 2% of the variance in Negative Affect, $F(1, 278) = 5.71$, $p < .05$ (Table 5). The simple effects regression lines for people with high, medium, and low levels of Neuroticism are shown in Figure 20. These effects assume an average amount of physical health which was not included in the interaction. As shown in Figure 20, older adults high in Neuroticism experience high levels of negative affect regardless of how they perceive their time quality. The lower the levels of Neuroticism older adults report, the stronger the negative relationship between time quality and negative affect becomes. Those individuals with low Neuroticism experience lower levels of negative affect the higher the quality of their daily activities are perceived to be.

In the third of these analyses the Neuroticism x Physical Health interaction accounted for 1% of the variance in Negative Affect, $F(1, 278) = 4.08$, $p < .05$ (Table 6). The simple effects regression lines for people with high, medium, and low levels of Neuroticism are shown in Figure 21. These effects assume an average amount of time quality which was not included in the interaction.

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Table 5

Summary of Hierarchical Regression Analysis Predicting Negative Affect Including the Neuroticism by Time Interaction

Variable	*B*	*SE B*	*β*	ΔR^2
Step 1				.21 **
Time	-0.18	.06	-.18 **	
Physical Health	-0.14	.06	-.14 *	
Neuroticism	0.27	.06	.27 **	
Step 2				.02 *
Time	-0.13	.07	-.13	
Physical Health	-0.13	.06	-.13	
Neuroticism	0.27	.06	.28 **	
Neuroticism x Time	- 0.12	.05	.13 *	

Note. The constant was -0.01, (*SE* = .05) in Step 1 and -0.06, (*SE* = .06) in Step 2 (neither was significant).

p < .05. **p* < .01.

Figure 20

Regression Lines Depicting the Effect of Time on Negative Affect at Different Levels of
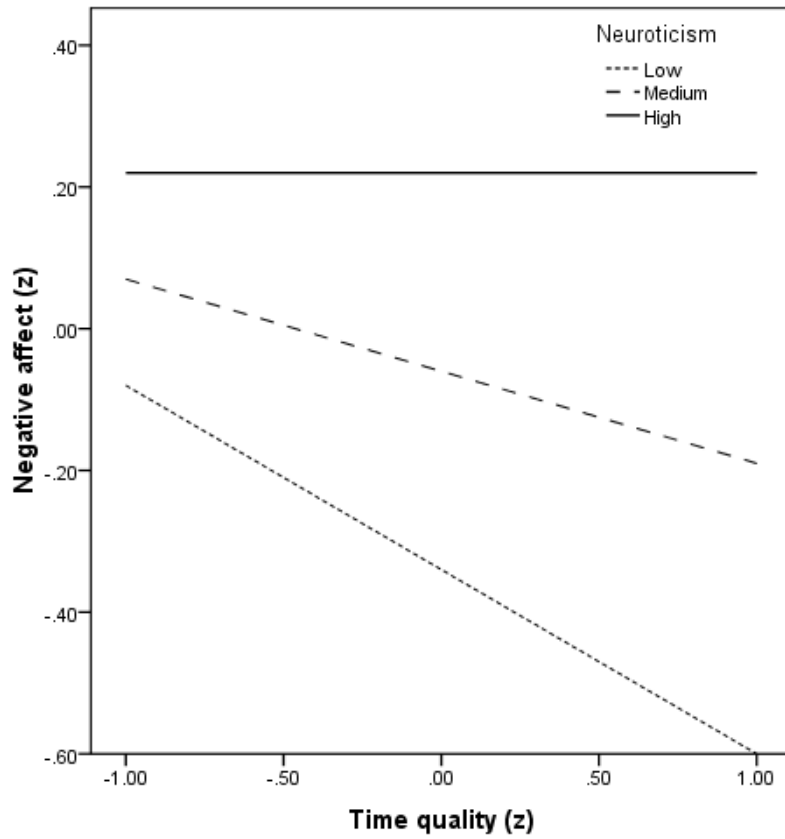
Neuroticism

Table 6

Summary of Hierarchical Regression Analysis Predicting Negative Affect Including the Neuroticism by Physical Health Interaction

Variable	*B*	*SE B*	*β*	ΔR^2
Step 1				.21 **
Time	-0.18	.06	-.18 **	
Physical Health	-0.14	.06	-.14 *	
Neuroticism	0.27	.06	.27 **	
Step 2				.01 *
Time	-0.16	.06	-.16 **	
Physical Health	-0.12	.06	-.12	
Neuroticism	0.27	.06	.28 **	
Neuroticism x Health	-0.10	.05	.11 *	

Note. The constant was -0.01, (*SE* = .05) in Step 1, and -0.05, (*SE* = .06) in Step 2; neither was significant.

*p < .05. **p < .01.

Figure 21

Regression Lines Depicting the Effect of Physical Health on Negative Affect at Different

Levels of Neuroticism
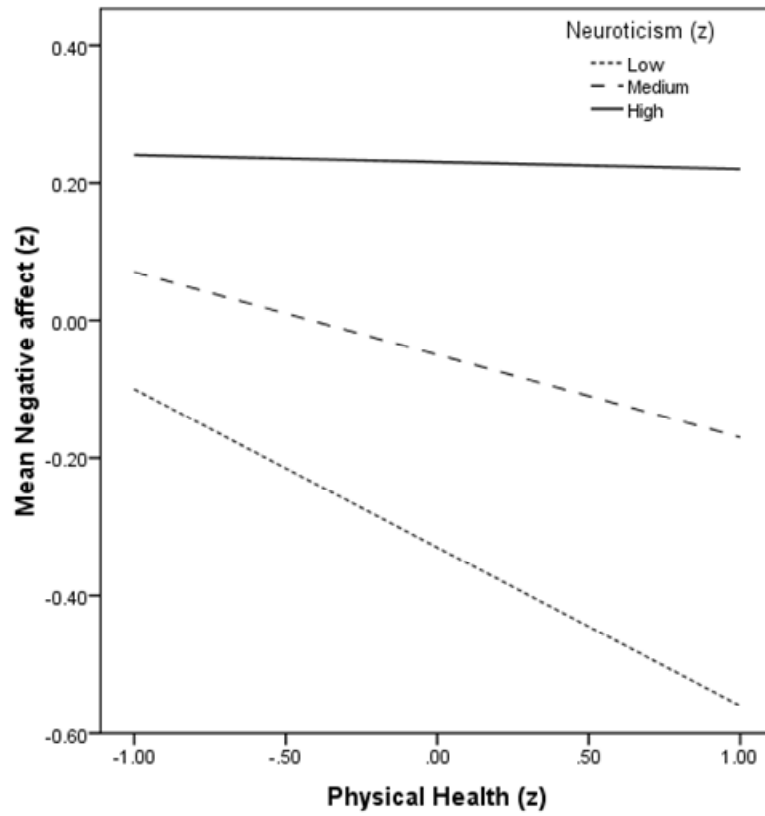
A similar relationship is shown in Figure 21 that was depicted in Figure 20. Older adults high in Neuroticism experienced higher levels of negative affect regardless of how they rated their physical health. The lower the levels of Neuroticism older adults reported, however, the stronger the negative relationships between physical health and negative affect; that is, for those older individuals low in Neuroticism, they experienced low levels of negative affect the higher their quality of physical was perceived to be.

In the second series of hierarchical analysis examining possible interactions involving Extraversion, the main effects of Time, Environmental quality, and Extraversion were entered at the first step followed by the three two-way interactions at the second step and the three-way interaction at the third step. The three-way interaction explained an additional 1% of the variance in Positive Affect, $F(1, 276) = 3.90$, $p < .05$ (Table 7).

Table 7

Summary of Hierarchical Regression Analysis for Variables Predicting Positive Affect

Variable	B	$SE\ B$	β	ΔR^2
Step 1				.15 **
Time	.18	.06	.18 **	
Environment	.19	.06	.20 **	
Extraversion	.20	.06	.20 **	
Step 2				.03 *
Time	.22	.06	.22 **	
Environment	.21	.06	.21 **	
Extraversion	.17	.06	.17 **	
Time x Environment	.13	.05	.15 **	
Time x Extraversion	.09	.06	.10	
Environment x Extraversion	-.02	.06	-.02	
Step 3				.01 *
Time	.22	.06	.22 **	
Environment	.20	.06	.20 **	
Extraversion	.14	.06	.14 **	
Time x Environment	.12	.05	.14 *	
Time x Extraversion	.13	.06	.14 *	
Environment x Extraversion	.00	.06	.00	
Time x Environment x Extraversion	.09	.04	.13 *	

Note. The constant was 0.01, ($SE = .06$) in Step 1, and -0.04, ($SE = .06$) in Step 2, and -0.05, ($SE = .06$) in Step 3; none were significant.

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

In order to examine this three-way interaction, the sample of 286 older adults was divided into thirds based on each participant's Extraversion factor score. The bottom third Extraversion group included 95 participants with factor scores ranging from -2.67 to -0.44 ($M = -1.09$, $SD = .52$). The middle third Extraversion group included 96 participants with factor scores ranging from -0.45 to 0.41 ($M = -0.04$, $SD = .25$). The top third Extraversion group included 95 participants with factor scores ranging from 0.42 to 2.11 ($M = 1.14$, $SD = .42$).

Three hierarchical analyses were conducted with Positive Affect as the dependent variable, one for each of the three Extraversion groups. In all three analyses the main effects for Environment and Time were entered at the first step and the two-way Environment x Time interaction was entered at the second step. In the hierarchical analysis conducted on the group with the lowest Extraversion the Environment x Time interaction accounted for 1% of the variance in Positive Affect, $F(1, 91) = 1.36$, $p < .30$. The Environment x Time interaction was not significant in the group with Extraversion in the midrange, $F(1, 91) = 0.001$, $p < 1.00$. In the hierarchical analysis conducted on the group with the highest Extraversion factor scores, the Environment x Time interaction accounted for 10% of the variance in Positive Affect, $F(1, 90) = 11.52$, $p < .001$. The results of this final analysis are displayed in Table 8.

The simple effects regression lines for people high in Extraversion and with high, medium, and low levels of environmental satisfaction are shown in Figure 22.

Table 8

Summary of the Hierarchical Regression Analysis for Variables Predicting Positive Affect in Participants with High Extraversion Scores

Variable	B	$SE\ B$	β	ΔR^2
Step 1				.15 **
Time	.29	.12	.26 *	
Environment	.20	.11	.19	
Step 2				.10 **
Time	.38	.12	.34 **	
Environment	.26	.11	.25 *	
Time x Environment	.28	.08	.33 **	

Note. The constant was 0.16, (*SE* = .11) in Step 1 and 0.01, (*SE* = .11) in Step 2; neither was significant.

p < .05. **p* < .01.

Figure 22

Regression Lines Depicting the Effect of Time Quality on Positive Affect at Different

Levels of Environmental Satisfaction for Older Adults High in Extraversion
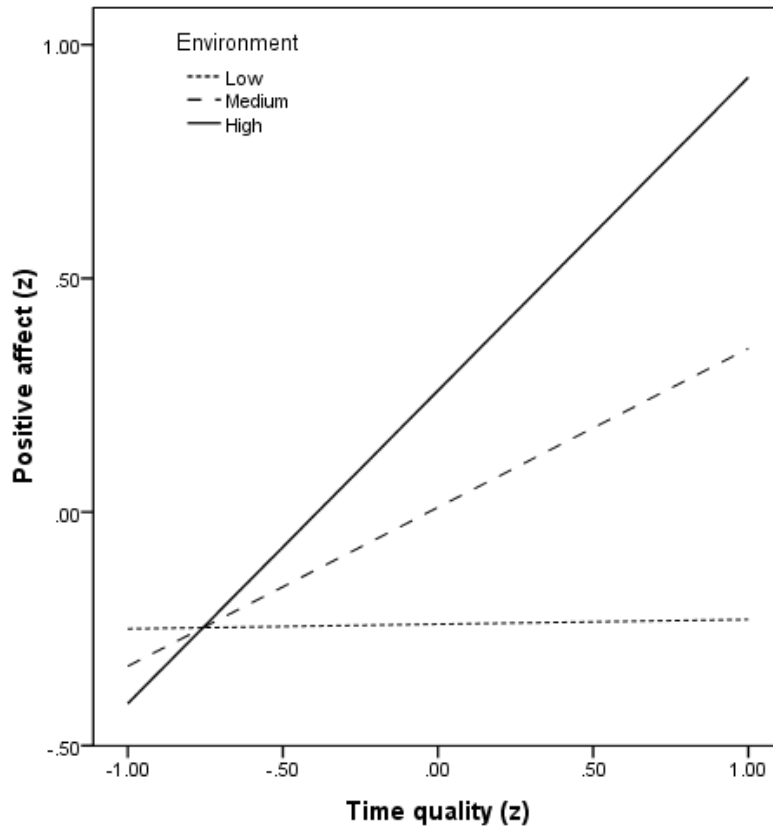
Older adults high in Extraversion are more sensitive to higher levels of quality of life; that is, those older adults who are highly extraverted and who perceive their Environmental and time quality as high experience high levels of positive affect. These highly extraverted older adults are rewarded with increased positive affect the better they perceive their environment and their daily activities to be. Interestingly, those highly extraverted older adults who perceive their environment as low in quality receive no affective benefit from higher levels of time quality. They experience low levels of positive affect across all levels of time quality.

Younger Adults

I conducted a series of structural equation models using the data from the younger adult sample to evaluate whether the relationships observed in the older adult sample held in a younger cohort. One significant difference between the structural analyses conducted in the younger adults compared with the older adults should be noted; no Time quality factor was included in the younger adult models. Model fit statistics for these structural models are given in Table 9.

Model 1 for the younger adults mirrored Model 1 in the older adult sample by regressing all *interpersonal* quality-of-life factors (Friends and Environment) on Positive Affect, and all *intrapersonal* quality-of-life factors (Physical Health) on Negative Affect. Family quality was included, allowing this factor to load on both Positive and Negative Affect. As seen in Table 9, the overall fit for Model 1 was good, $\chi^2(581) = 919.33$, $p < .0001$, RMSEA = .054 (90% CI, .047 - .061), NNFI = .97, CFI = .97. The structural loadings, interfactor correlations, and error variances are given in Figure 23.

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Table 9

Global Fit Indices for the Structural Models Assessing the Relationships between Quality of Life and Affect in the Younger Adult Sample

			Global model fit indices			
Model	χ^2	*df*	RMSEA	RMSEA 90% CI	NNFI	CFI
1	919.33**	581	.054	.047 - .061	.97	.97
2	593.92**	369	.055	.047 - .063	.97	.97
3	934.95**	584	.055	.048 - .061	.97	.97
4	1274.22**	882	.047	.041 - .053	.97	.97

Note. RMSEA = root-mean-square errors of approximation; NNFI = non-normed fit index; CFI = comparative fit index.

** *p* < .0001.

Figure 23

Structural Loadings, Error Variances, and Correlations among the Factors for the Model 1 Structural Relationships between Quality of Life and Affect in a Younger Adult Sample
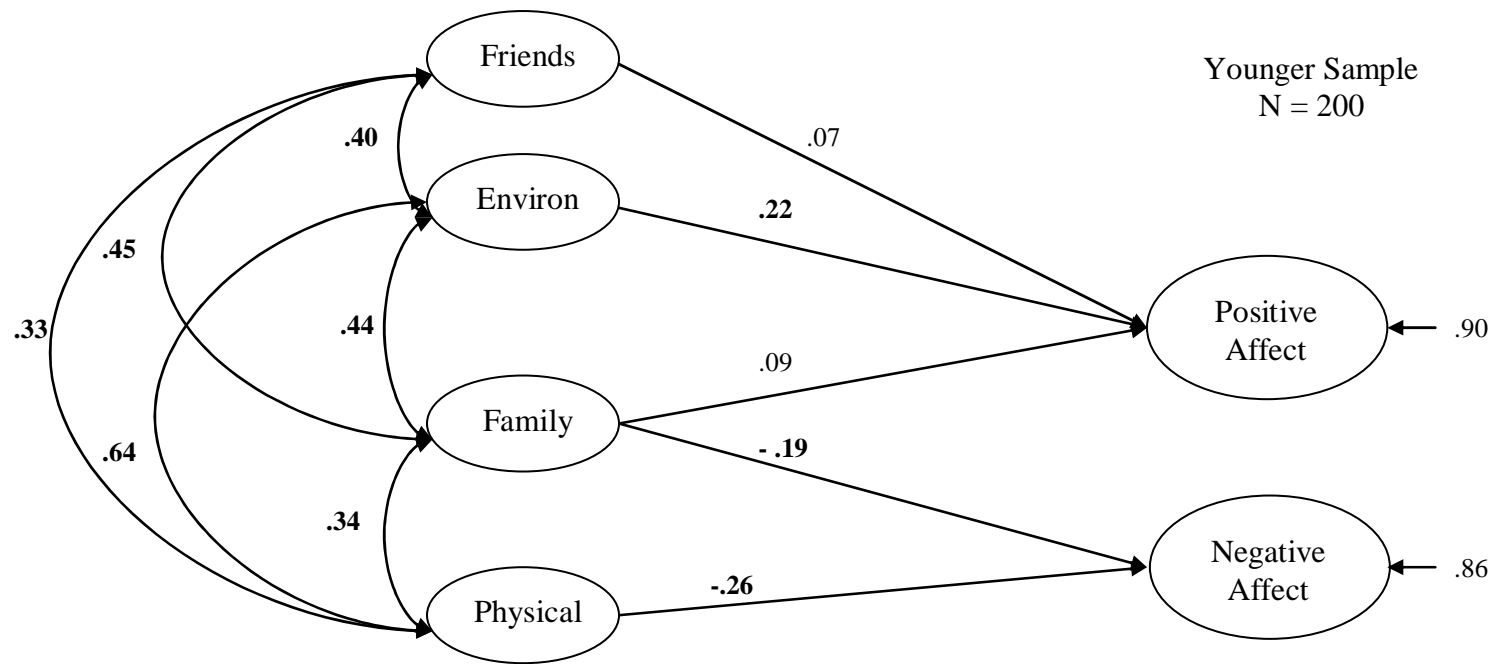
Note. **Bold** denotes significant correlations and factor loadings.

As with the older adults in this present study, but contrary to Lawton and colleagues' findings (1999), Friends quality was not related to Positive Affect. Environmental quality and Physical Health were significantly related to Negative Affect. Interestingly, Family quality had a significant negative relation with Negative Affect in this younger adult sample (no significant relation, however, with Positive Affect). Although this model fits the data well, the independent variables account for only 10% of the variance in Positive Affect and 14% of the variance in Negative Affect, a significant decline from the variance accounted for by these relationships in the older adult sample.

Model 2 in the younger adult sample simplified the findings from Model 1 by removing all nonsignificant relationships. Friends quality was removed from the model entirely as was the pathway between Family quality and Positive Affect. This model also fit the data well, $\chi^2(369) = 593.92$, $p < .0001$, RMSEA = 0.055 (90% CI, .047 - .063), NNFI = .97, CFI = .97. As shown in Figure 24, all relationships specified in the model were significant but again these relationships only account for 9% of the variance in Positive Affect and 14% of the variance in Negative Affect.

I conducted a structural analysis, Model 3, in this younger adult sample that, in part, mirrored the Physical/Social Model of Affect conducted on the older adult sample shown in Figure 10. As shown in Table 9, Model 3 in the younger cohort fit the data well, $\chi^2(584) = 934.95$, $p < .0001$, RMSEA = .055 (90% CI, .048 - .061), NNFI = .97, CFI = .97. Figure 25 displays the factor loadings, explained variance, and interfactor correlations for this model in the younger adults.

Figure 24

Structural Loadings, Error Variances, and Correlations among the Factors for the Model 2 Structural Relationships between Quality of Life and Affect in a Younger Adult Sample
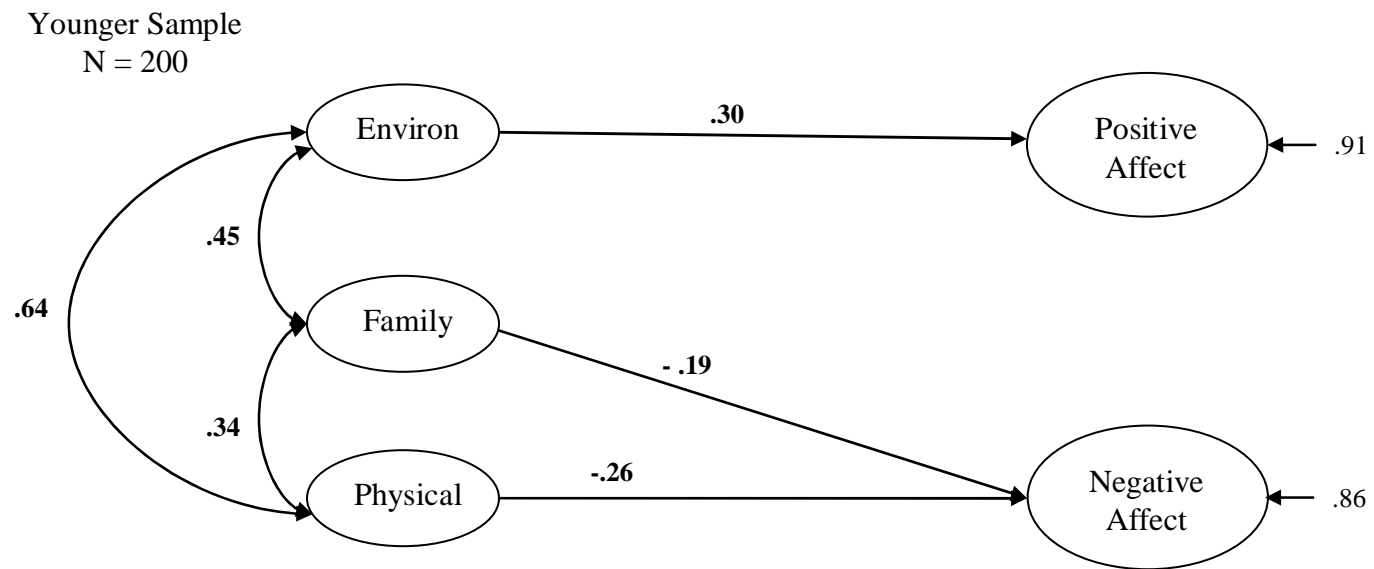
Note. **Bold** denotes significant correlations and factor loadings.

Figure 25

Structural Loadings, Error Variances, and Correlations among the Factors for the Model 3 Structural Relationships between Quality of Life and Affect in a Younger Adult Sample
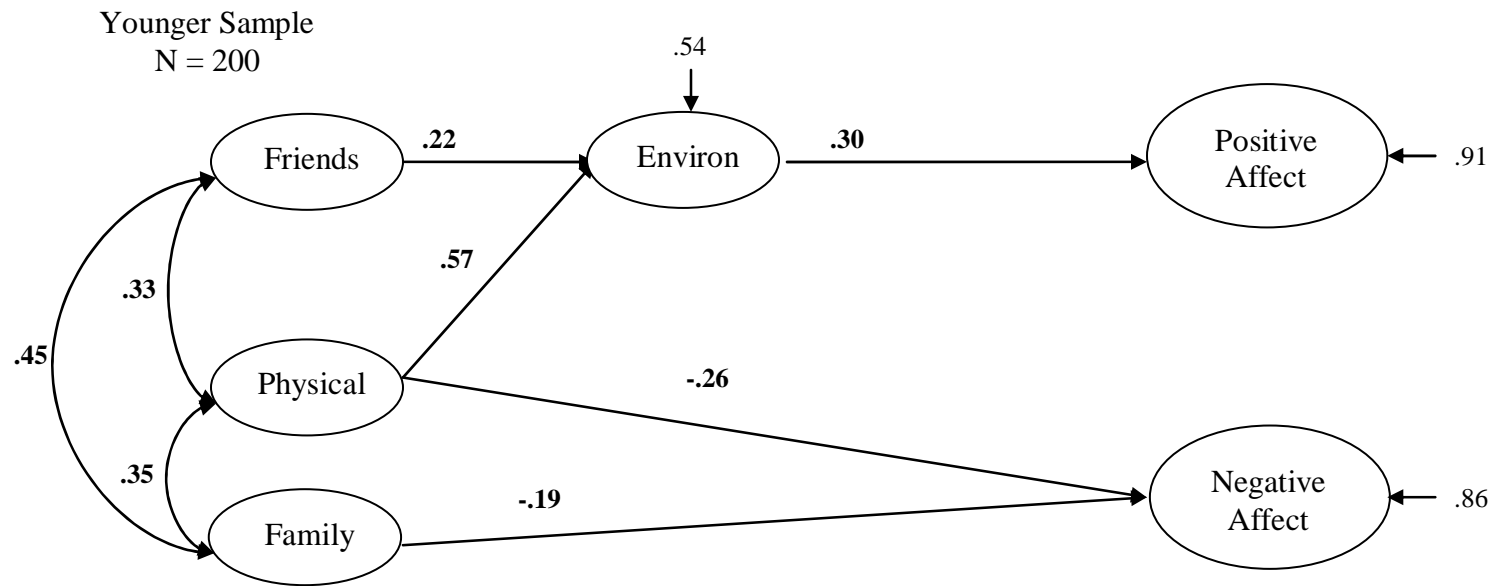
Note. **Bold** denotes significant correlations and factor loadings.

Even in this younger adult sample the quality of individuals' friendships and physical health significantly predict their perception of the quality of their environment, accounting for 46% of the variance in Environmental quality. Still, in all of these models conducted on the younger adults, only a small proportion of the variance in affect was being explained by these components of quality of life.

I conducted one final structural model for the younger sample including personality, specifically Extraversion and Neuroticism. A confirmatory factor analysis including the four items for Extraversion (Items 1, 6, 11, and 16) and the four items for Neuroticism (Items 4, 9, 14, and 19) from the Mini IPIP was conducted to assess the fit of the measurement model prior to conducting the structural analysis. The model fit the data less than adequately, $\chi^2(19) = 48.63$, $p < 0.001$, RMSEA = .089 (90% CI, .058 - .12), NNFI = .92, CFI = .95. The modification indices suggested correlating the error between Items 6 (*I don't talk a lot*) and 16 (*I keep in the background*). After doing so, the overall fit of the measurement model improved, $\chi^2(18) = 34.64$, $p < 0.05$, RMSEA = .068 (90% CI, .032 - .10), NNFI = .94, CFI = .96 (this model significantly improved the fit of the previous model, $\chi^2\Delta(1) = 13.99$, $p < .0001$). Six of the eight items shared more than 30% of the variance with the corresponding factor (alpha coefficients greater than .55). The exceptions were Item 6 (alpha coefficient of .51, $R^2 = .26$; *I don't talk a lot*) with Extraversion and, as in the older adult sample, Item 9 (alpha coefficient of .54, $R^2 = .29$; *I am relaxed most of the time*) with Neuroticism. Because there were so few items per factor when using the Mini IPIP in modeling procedures, however, these items remained in the structural analyses. The factor loadings, error variances, correlation among the factor and correlated errors are displayed in Figure 26. Although the low reliability

coefficients and large error variances are not ideal for modeling procedures, I conducted structural analyses including personality in the model because these analyses were exploratory in nature.

Model 4 including Neuroticism and Extraversion fit the data well, $\chi^2(882) =$ 1274.22, $p < .00001$, RMSEA = .047 (90% CI, .041 - .053), NNFI = .97, CFI = .97 (see Table 9). As shown in Figure 27, the addition of the personality factors, in particular Neuroticism altered the significance of other relationships compared with Model 3 in the younger adults. The significant relationships between both Physical Health and Family quality with Negative Affect seen in Model 3 were no longer significant. The inclusion of the effects of the personality increased the explained variance in affect: The relationships specified in Model 4 in the younger adult sample (Figure 27) accounted for 4% more variance in Positive Affect (due to Extraversion) and 10% more variance in Negative Affect (due to Neuroticism) compared with Model 3 for the younger adults (Figure 25).

Figure 26

Factor Loadings, Error Variances, Correlated Errors, and Correlation Among the Factors for the Best Fitting Measurement Model

for Trait Personality in the Younger Adult Sample as Measured by Items from the Mini IPIP
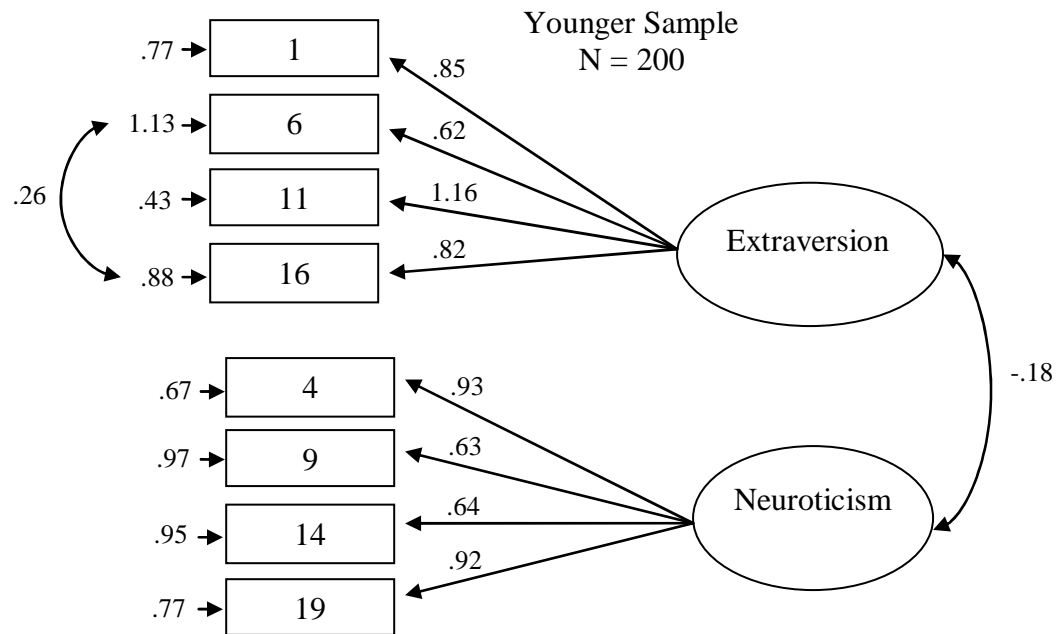
Figure 27

Structural Loadings, Error Variances, and Correlations among the Factors for the Model 4 Structural Relationships between

Personality, Quality of Life, and Affect in a Younger Adult Sample
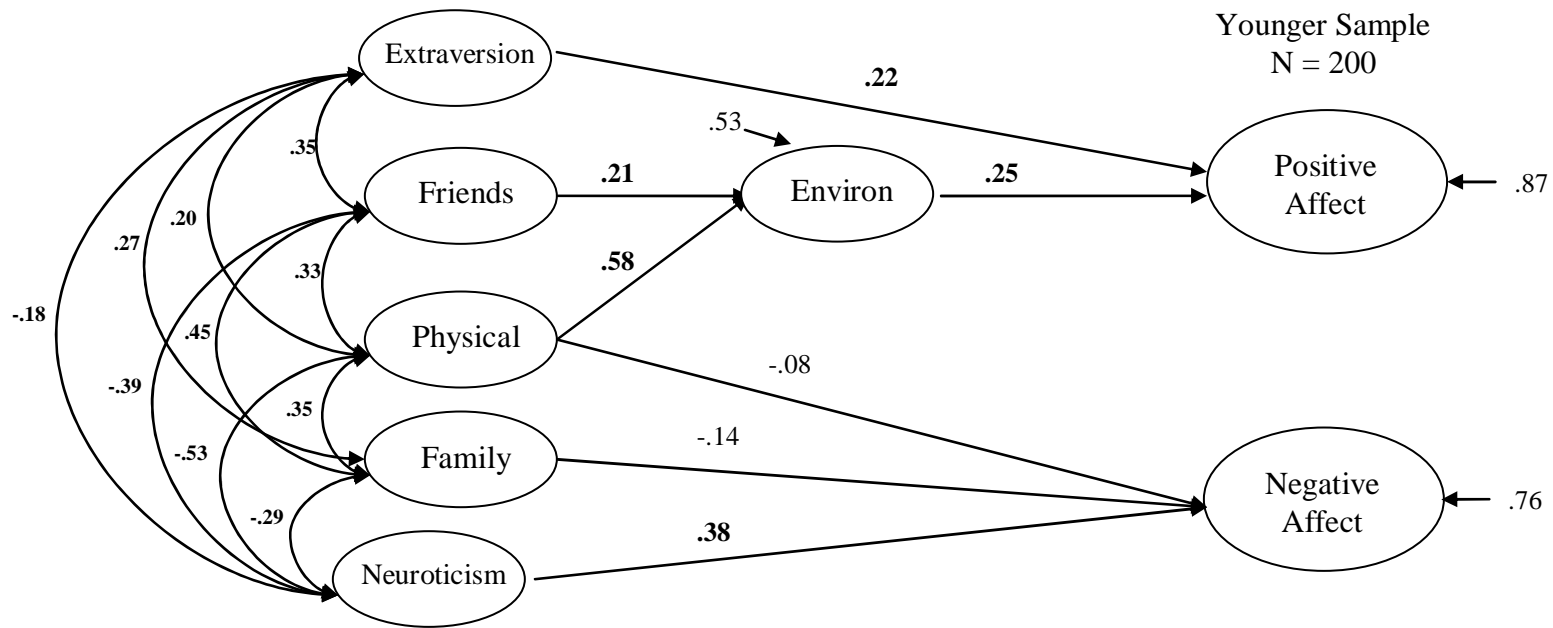
Note. **Bold** denotes significant correlations and factor loadings.

Study 2

*Negative Affect*

The means and standard deviations of the negative affect scores after each of the three levels of the PASAT task (silence, preferred music, nonpreferred music) are shown by age decade in the upper portion of Table 10. The effect of the experimental manipulation of the environment during a cognitive task on negative affect was analyzed using a mixed model design with the environmental manipulation (preferred vs. nonpreferred music) as the within subjects variable. The dichotomous variable representing order of presentation and the continuous variable age were between-subjects variables. Because of the quantitative nature of the between-subjects variable age, the analysis was conducted using PROC MIXED in SAS. Prior to the analysis the effect of the task itself on negative affect, measured by the participants' responses to the 10-adjectives representing negative affect from the PANAS assessed after Level 1 (conducted in silence), was partialled out of the negative affect scores in the two music conditions. The residualized negative affect score (upper portion of Table 11) was used as the dependent variable in the mixed model analyses.

As summarized in Table 12, the analysis revealed no significant main effects of age, order of presentation, or environment on the residual negative affect ratings. None of the two-way interactions or the three-way interaction was significant. The hypothesis that the nonpreferred environmental condition would increase negative affect was not supported. The environmental manipulation had no effect on the participants' levels of negative affect.

Table 10

Means and Standard Deviations for Positive Affect Raw Scores from the PANAS across

Three Experimental Levels by Age-Decade

Age decade (*n*)	Level 1		Preferred environment		Nonpreferred environment	
	M	*SD*	*M*	*SD*	*M*	*SD*
Negative affect						
20s (10)	13.90	5.80	12.80	3.26	13.70	4.57
30s (11)	18.27	7.91	17.91	8.10	20.18	7.43
40s (10)	14.80	5.43	14.80	7.07	14.00	3.77
50s (10)	18.30	9.50	14.50	10.46	15.90	10.96
60s (10)	16.10	6.44	13.70	4.19	14.90	4.75
70s (11)	17.64	9.55	13.27	3.82	17.27	9.50
80s (10)	22.00	9.13	19.90	11.74	20.90	11.04
Positive affect						
20s (10)	26.50	5.20	27.00	7.36	25.10	6.69
30s (11)	31.36	7.37	34.64	8.65	30.27	9.01
40s (10)	29.80	5.14	33.90	7.11	28.40	8.19
50s (10)	31.80	8.08	33.50	8.75	31.30	9.72
60s (10)	28.30	5.40	29.40	7.49	29.50	8.00
70s (11)	33.27	6.94	32.27	8.22	32.54	8.14
80s (10)	30.90	9.13	30.80	8.55	30.80	9.58

Note. n = sample size within each age decade; *M* = mean; *SD* = standard deviation.

Table 11

Means and Standard Deviations for the Residualized Positive Affect Scores from the

PANAS across Two Experimental Conditions by Age Decade

Age decade (n)	Nonpreferred environment		Preferred environment	
	M	SD	M	SD
Negative affect				
20s (10)	-0.41	2.16	-0.41	2.00
30s (11)	2.68	5.61	2.05	6.16
40s (10)	-0.81	2.51	1.04	5.00
50s (10)	-1.62	7.85	-1.38	8.62
60s (10)	-0.92	5.98	-0.85	2.24
70s (11)	0.27	4.50	-2.21	5.09
80s (10)	0.51	7.81	1.78	9.71
Positive affect				
20s (10)	-0.83	4.22	-1.07	3.96
30s (11)	-0.51	6.31	1.97	5.70
40s (10)	-0.82	4.88	2.71	4.18
50s (10)	0.09	6.99	0.42	6.03
60s (10)	1.78	4.27	-0.37	3.97
70s (11)	-0.14	3.95	-2.20	4.13
80s (10)	0.48	3.31	-1.43	4.07

Note. n = sample size within each age group; *M* = mean; *SD* = standard deviation.

Table 12

Summary Table of the Fixed Effects from the Mixed Model Analysis on Residualized

Negative Affect in the Total Sample

Source	df	F	p
Between subjects			
Age	1, 72	0.20	0.65
Order	1, 72	0.34	0.56
Age x Order	1, 72	0.87	0.35
Within subjects			
Environment	1, 72	0.03	0.86
Age x Environment	1, 72	0.04	0.84
Order x Environment	1, 72	0.03	0.86
Age x Order x Environment	1, 72	0.08	0.78

As shown in Table 10 the youngest age group showed almost no negative affect (minimum score on PANAS is 10) and little variability in their affective responses in all three conditions. As mentioned in the Methods section, 9 of the 10 participants in this group were undergraduates ranging in age from 18 to 22 years. I was concerned that the lack of variability in age as well as the little reported affect by this youngest age group would unduly influence the analysis. Therefore I repeated the analysis excluding them. The results are summarized in Table 13; again, there were no significant effects.

Positive Affect

The means and standard deviations of positive affect scores from the three levels of the PASAT task are shown in the lower portion of Table 10. In the same way as was done for negative affect, the positive affect scores from the silence condition were partialled out of the positive affect scores from the preferred and nonpreferred music conditions (lower portion of Table 11). Then the same analysis conducted for negative affect was conducted using the residualized positive affect variable as the dependent variable. As summarized in Table 14 the analysis revealed a significant main effect of environment, $F(1, 72) = 5.03$, $p < .03$, and a significant age by environment interaction, $F(1, 72) = 5.77$, $p < .02$. None of the other main effects or interactions was significant.

As I did in the analysis of negative affect, I repeated this analysis omitting the college students. The results of this analysis on the reduced sample are summarized in Table 15. The same effects were observed as in the analysis of the total sample, although magnitudes were larger.

Table 13

Summary Table of the Fixed Effects from the Mixed Model Analysis on Residualized

Negative Affect excluding Undergraduate Participants

Source	df	F	p
Between subjects			
Age	1, 63	0.35	0.56
Order	1, 63	0.53	0.47
Age x Order	1, 63	0.96	0.33
Within subjects			
Environment	1, 63	0.00	0.99
Age x Environment	1, 63	0.00	0.98
Order x Environment	1, 63	0.02	0.88
Age x Order x Environment	1, 63	0.03	0.86

Table 14

Summary Table of the Fixed Effects from the Mixed Model Analysis on Residualized

Positive Affect in the Total Sample

Source	df	F	p
Between subjects			
Age	1, 72	0.05	0.83
Order	1, 72	0.04	0.84
Age x Order	1, 72	0.03	0.87
Within subjects			
Environment	1, 72	5.03	0.03
Age x Environment	1, 72	5.77	0.02
Order x Environment	1, 72	0.02	0.88
Age x Order x Environment	1, 72	0.00	0.97

Table 15

Summary Table of the Fixed Effects from the Mixed Model Analysis on Residualized

Positive Affect excluding Undergraduate Participants

Source	df	F	p
Between subjects			
Age	1, 63	0.85	0.36
Order	1, 63	0.16	0.69
Age x Order	1, 63	0.01	0.92
Within subjects			
Environment	1, 63	13.53	0.01
Age x Environment	1, 63	14.16	0.01
Order x Environment	1, 63	3.21	0.08
Age x Order x Environment	1, 63	2.94	0.09

The descriptive statistics for the residualized positive affect scores in the two environmental conditions with six age groups rather than seven are shown in the lower portion of Table 16. All undergraduate participants were excluded; the 28-year-old participant was included within the 30-year-old age group. The preferred environmental condition had a beneficial effect on positive affect in the 30- and 40-year-old participants, little effect on those participants in their 50s, and a negative effect in the 60-, 70-, and 80-year-old participants. Because of these results, I collapsed the 30- and 40-year-old participants and did the same for the 60-, 70-, and 80-year-old groups to form three age groups.

Using the SPSS statistical program, post hoc paired sample t tests indicated that for those under age 50, the mean of residualized positive affect for the preferred environment ($M = 2.30$, $SD = 4.81$) was significantly higher than the mean for the residualized nonpreferred environment ($M = -0.78$, $SD = 5.44$). There was no difference between the two conditions for the 50-year-old group. The mean of positive affect in the preferred environment ($M = -1.36$, $SD = 4.00$) was significantly lower than the mean of positive affect for the nonpreferred condition ($M = 0.68$, $SD = 3.82$) for those aged 60 and above. This age by environment interaction is displayed in Figure 28.

Personality

Pearson correlations between the five personality factors (Neuroticism, Extraversion, Intellect/Openness, Conscientiousness, and Agreeableness) and the residualized positive and negative affect scores under both the preferred and nonpreferred environmental conditions revealed only two significant relationships (Table 17).

Table 16

Means and Standard Deviations for the Residualized Positive Affect Scores from the

PANAS across Two Experimental Conditions by Age Decade Excluding Undergraduate

Participants.

	Nonpreferred environment		Preferred environment	
Age decade (*n*)	*M*	*SD*	*M*	*SD*
Negative Affect				
30s (12)	2.31	5.51	1.47	6.21
40s (10)	-0.81	2.51	1.04	5.00
50s (10)	-1.62	7.85	-1.38	8.62
60s (10)	-0.92	5.98	-0.85	2.24
70s (11)	0.27	4.50	-2.21	5.09
80s (10)	0.51	7.81	1.78	9.71
Positive Affect				
30s (12)	-0.75	6.08	1.97	5.44
40s (10)	-0.82	4.88	2.71	4.18
50s (10)	0.09	6.99	0.42	6.03
60s (10)	1.78	4.27	-0.37	3.97
70s (11)	-0.14	3.95	-2.20	4.13
80s (10)	0.48	3.31	-1.43	4.07

Note. n= sample size within each age group; *M* = mean; *SD* = standard deviation.

Figure 28

The Effect of Environment on Residualized Positive Affect Scores across Age-Groups
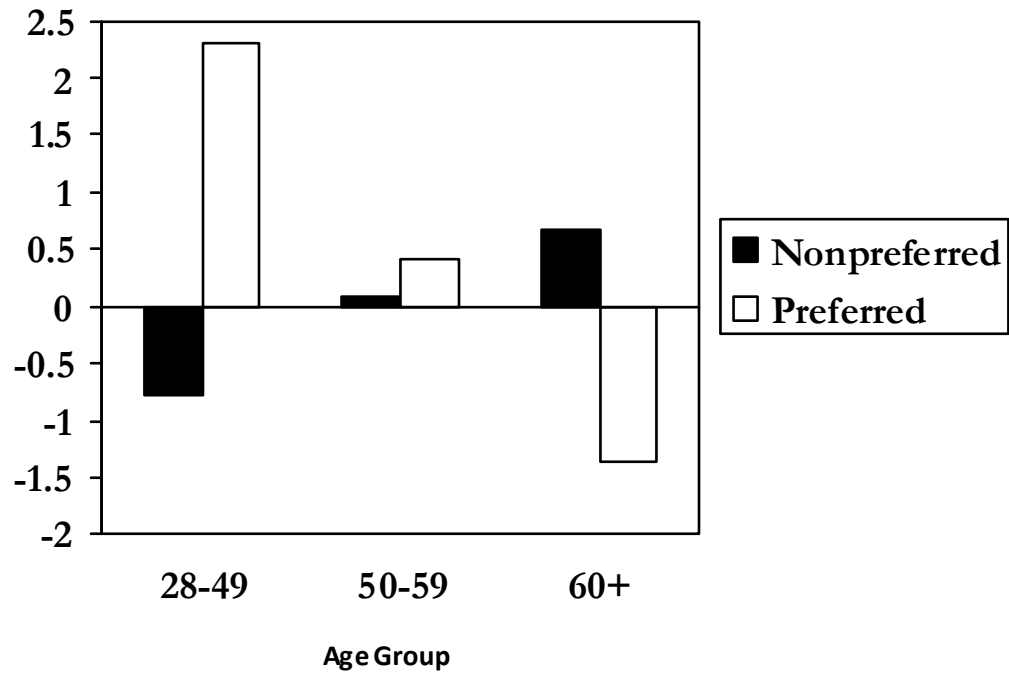
Table 17

Intercorrelations between Personality and Residualized Affect Scores under Preferred

and Nonpreferred Environmental Conditions

Personality	Positive Affect ($n = 72$)		Negative Affect ($n = 72$)	
	Nonpreferred	Preferred	Nonpreferred	Preferred
Extraversion	- .09	.01	.04	.06
Agreeableness	.04	- .05	- .13	.04
Conscientiousness	.11	- .11	- .16	- .04
Neuroticism	.04	.11	.17	.11
Intelligence	- .26 *	.02	- .26 *	- .22

* $p < .05$.

Intellect/Openness was significantly correlated with both the residualized negative affect ($r = -.26$, $p < .03$) and residualized positive affect ($r = -.26$, $p < .03$) in the nonpreferred condition. When each personality factor was entered as a between subjects factor along with age in the mixed model that included environmental manipulation as the within subjects variable (order of presentation was removed because it added nothing to the model in the previous analyses), none of the main effects of the five personality factors significantly predicted residualized positive affect. Likewise, none of the two and three-way interactions involving personality significantly predicted residualized positive affect.

Similar results were observed in four of the five analyses using residualized negative affect as the dependent variable. In the analysis that included Neuroticism there was a significant three-way interaction between age, Neuroticism, and environment, $F(1, 72) = 4.13$, $p < .046$. Although this effect was nonsignificant when a Bonferroni correction was used, as is recommended when multiple analyses are conducted, the three-way interaction was explored further for the sake of completeness.

Two hierarchical regression analyses were performed using the SPSS statistical package with preferred negative affect and nonpreferred negative affect as the two dependent variables. The main effects of age and Neuroticism were entered at the first step of the analysis, and the age by Neuroticism interaction was entered at the second step. There were no significant effects in either regression analysis. Although replicating a three-way interaction is often difficult, it should be noted that the significant three-way interaction was observed using the powerful maximum likelihood estimation in the mixed model design, whereas the simple effects hierarchical regression found no significant

effects using the less powerful ordinary least squares approach. Displayed in Figures 29 and 30 are the regression lines predicting both the residualized nonpreferred negative affect and the residualized preferred negative affect by Neuroticism for each of the six age groups (the undergraduates were again excluded because of the lack of variability in negative affect reported).

Figure 29

Regression of Residualized Negative Affect under the Nonpreferred Environmental

Condition on Neuroticism by Age Decade
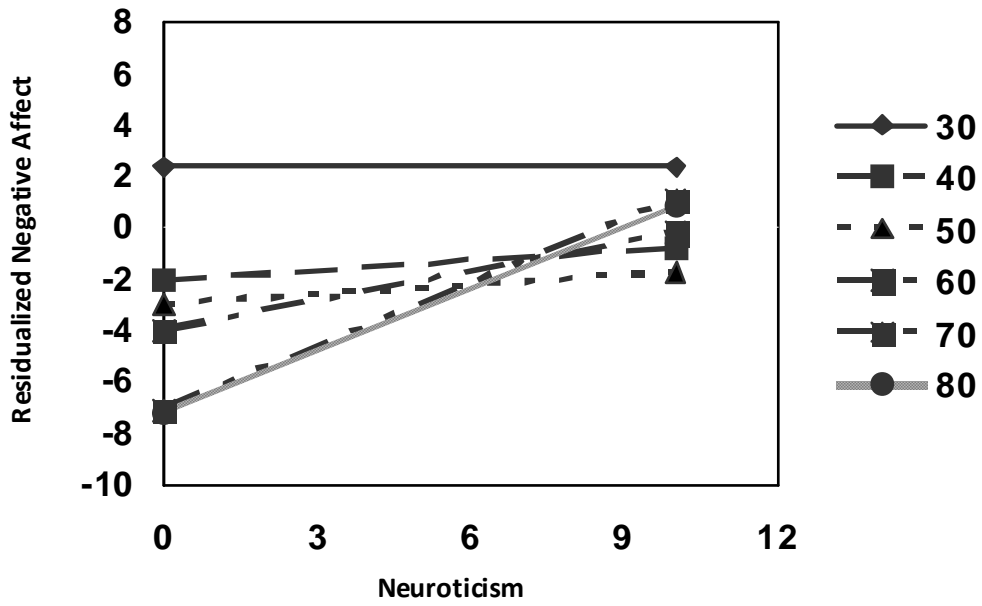
Figure 30

Regression of Residualized Negative Affect under the Preferred Environmental Condition on Neuroticism by Age Decade
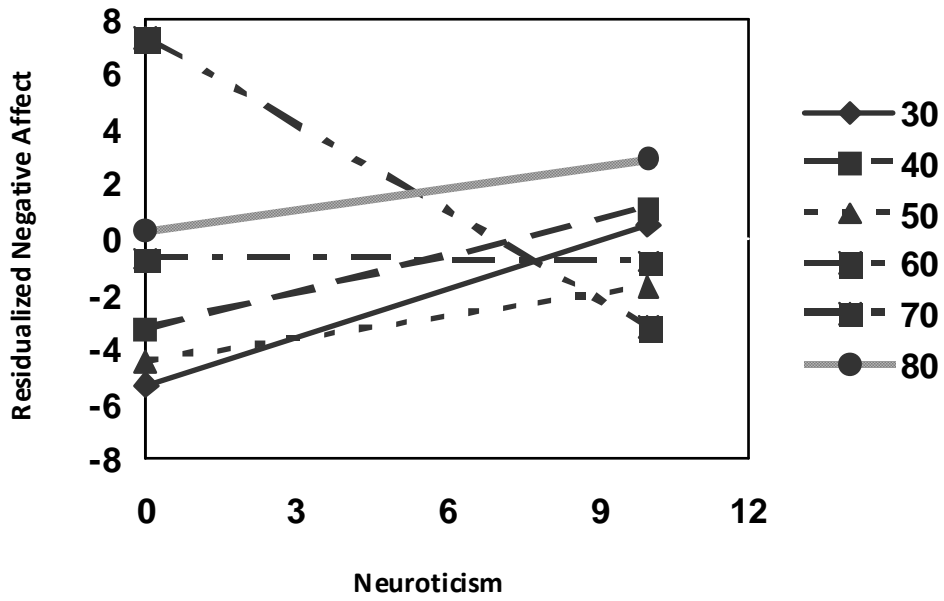
CHAPTER 6: DISCUSSION

The Dual Channel Hypothesis

The results from the structural equation models conducted on the older adult

sample only partially replicated the relationships between quality-of-life components and

affect found by Lawton and colleagues (1999). As shown in Models 1 through 3, there

was some evidence for Lawton's (1996) dual channel hypothesis in which he predicted that

interindividual or externally engaging components of quality of life such as a person's

relationship with friends related only to positive affect but not to negative affect and

intraindividual components like personality, in particular neuroticism, related to negative

affect but not to positive affect. In the present study the interindividual components of

quality of life such as satisfaction with one's environment predicted positive affect but not

negative affect.

Although Lawton and colleagues (1999) did not measure environmental

satisfaction, this factor and its relation to positive affect are conceptually appropriate under

the dual channel hypothesis. Satisfaction with one's environmental surroundings is a more

interindividual component of quality of life similar to satisfaction with friendships and

hence under Lawton's hypothesis would relate to positive affect but not negative affect

(Langer & Rodin, 1976). From a conceptual standpoint, the finding that older adults'

positive affect was influenced by their environmental satisfaction fits the dual channel

hypothesis.

The quality of an older adult's physical health predicted negative affect but not

positive affect. This finding replicates previous findings (Lawton et al., 1999) and

supports the idea that an individual's physical health is an intraindividual phenomenon

that, according to the dual channel hypothesis, influences negative affect but has no relationship with positive affect.

Time quality, as in Lawton et al.'s model (1999), appears to reflect both internal and external mechanisms and relate to both positive and negative affect. This was evidenced in this present study by the relations that time quality shared with externally engaging components of an older adult's life (environmental satisfaction and satisfaction with their friends) as well as with more internal processes such as the perception of the quality of physical health. Judgments about the quality of how older adults spend their time during the day seem to be influenced by how satisfied they are both with their friends and environment as well as by how satisfied they are with their current physical condition. These relationships should be examined in greater detail in future research to determine if one dimension is more important than the other in predicting the quality of an older adult's daily activities.

The quality of older adults' relationship with their family did not significantly predict either positive or negative affect, replicating previous findings (Lawton et al., 1999). Lawton and colleagues and others have speculated that an older adult's relationship with family becomes too complicated and hence does not fit "neatly" into this notion of a dual channel model (Lee & Sheehan, 1989). Also, it should be noted that the questions used in both Lawton et al.'s model (1999) and the present study asked participants to rate their family excluding spouse (see Appendix A). This omission may be at fault for the lack of any relationship between family satisfaction and subjective well-being. In the case of older adults, the size of contemporary family members diminishes. By excluding a persons' spouse from ratings of family satisfaction, I may have excluded the only

remaining contemporary family in the older adult's life as well as perhaps the most

affectively relevant, thereby weakening the family satisfaction measure. Future studies

interested in better identifying how family satisfaction relates to positive or negative affect

in later life may want to compare the differences between spousal relationships and those

with other family members.

The most surprising finding from the models applied to the older adult sample was

the lack of a direct relationship between the quality of an older adult's friendships and

positive affect. Thought to be of increasing importance as people age and previously

found to strongly predict positive affect, social support was thought to strongly predict

positive affect (Lawton, 1996; Von Faber et al., 2001). As shown in Models 1through 3,

however, this was not the case. The quality of an older adult's friendships had no

significant direct relationship with positive affect, a finding that is antithetical to that

observed in Lawton and colleagues previous model (1999).

What was noted in Figure 12, however, was a strong relationship between the

quality of older adults' friendships and both the quality of their environment and the quality

of their daily activities. No significant direct pathway between the quality of the

friendships and positive affect that Lawton and colleagues noted in their model (1999)

existed in the present data. Could the quality of older adults' friendships influence positive

affect indirectly through the quality of their daily activities and the quality of their

environment? Along these same lines, strong relationships were also noted in Figure 12

between the quality of an older adult's physical health and both the quality of their

environment and their daily activities. These relationships were reminiscent of past

research highlighting the powerful effect that positive (or negative) perceptions of social

support and physical health can have on an older adult's outlook on life (Brown, Bruce, & Pearson, 2001; Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006). Despite the lack of a direct relationship between the quality of friendships and positive affect in the present study as I had originally predicted, these relationships between the quality-of-life indicators themselves and the past literature prompted further exploration of a model that highlighted the importance of social support and physical health in older adults.

Revised Model

A fourth, more exploratory model was conducted to explore the relationships amongst the quality-of-life indicators. This model maintained the relationships rooted in the dual channel hypothesis (Lawton, 1996) and supported previously (Lawton et al., 1999) with time quality relating to both positive and negative affect, environmental satisfaction relating to positive affect, and physical health directly relating to negative affect. The model, however, expanded the role perceived physical health and friendships played with respect to subjective well-being (Table 2, Figure 14).

The revised model suggests that the role older adults' perceptions of their physical health and social support plays may be more complicated than predicted by the dual channel hypothesis The quality of older adults' physical health and friendships significantly predicted their time quality and their environmental quality. The relation between the quality of physical health and environmental quality is of particular import because the former was believed to be an intraindividual quality-of-life component that relates to negative affect and the latter an externally engaging quality-of-life component that relates only to positive affect. Over 60% of the variance in environmental satisfaction was explained by older adults' perceived quality of their friendships and physical health.

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The findings from the revised model suggest that the dual channel hypothesis may be overly simplistic. Lawton's (1996) hypothesis assumed that the model of quality of life and affect in older adults was a clear cut model with externally engaging components relating to positive affect but not negative affect and intraindividual components affecting negative affect but not positive affect. The results of the physical/social model challenge this hypothesis. Quality of friendships is indeed an important aspect of an older adult's quality of life, but it had no significant direct effect on the older adults' positive affect in the present study as previously suggested and then observed by Lawton and his colleagues (Lawton, 1996; Lawton et al., 1999). The quality of the physical health of older adults did not influence just negative affect; its effect was more far reaching, affecting positive affect by influencing the quality of an older adult's perceived environment which, in turn, influenced an older adult's experience of positive affect.

This revised physical/social model is important clinically because it suggests the potential power older adults' perception of their physical health and friendships has on both other aspects of their quality of life and the entirety of their affective experience, which could be described as a *domino effect*. That is, the more satisfied older adults are with their friendships, the more satisfied they are with their environment and the quality of their time and, hence, the more positive affect they experience and the less negative affect they experience. The better older adults perceive their physical health to be, the more satisfied they are with their environment and time quality and, hence, the more positive affect and the less negative affect their experience, which underscores the importance that these two components play on an older adult's sense of self.

As Lawton et al. (1999) found in their model of both objective and subjective quality-of-life indicators and affect, the objective indicators contributed little to the overall model. They related to affect only indirectly through the subjective indicators on affect (with the exception of activity participation, which weakly related to positive affect). It is not how many friends or activities an older adult has or how many trips to the doctor an older adult makes, but rather the importance the older adult attributes to these areas of quality of life that influences overall well-being (Pinquart, 2001). Similar to the belief of cognitive behavioral therapists that it is the perception and interpretation of an event rather than the event that causes changes in our mood, this revised model demonstrates that it is our perception of various areas of our quality of life that influences our affective state.

Some might argue that the factors have overlap at the item level. That is, items may ask roughly the same question on different factors thereby creating a spurious relation between them. There was, however, little apparent similarity at the item level among the factors. The quality of the older adults' friendships was based on their report of how much they felt loved and listened to by their friends, how well they felt treated by their friends, and how they perceived the overall quality of these relationships. The time quality factor was created from items addressing the issue of boredom during the day and how often older adults perceived themselves as having plenty of things to do on a daily basis. As mentioned earlier in the results section, the environmental satisfaction factor was an amalgamation of items assessing the perceived safety and health of their environments, how readily information was available, and how satisfied older adults were with their access to transportation. Physical health satisfaction was assessed via items addressing the

overall quality of physical health, how health prevented them from doing things they needed to do, as well as their energy level and capacity to do their work during the day.

The only potential overlap appears to be between time quality and physical health. The physical health items from the WHOBREF do address the ability of an individual to perform work/tasks satisfactorily. This may, on the surface, account for some of the relationship between physical health and time quality (the two factors were correlated .50; see Figures 11 to 13). That being said, the combination of the quality of friendships and physical health accounted for only 30% of the variance in time quality (see Figure 14) suggesting that there is substantial distinction between physical health satisfaction and time quality. Overall, the items that form each factor used in these structural models are largely specific to the factor without being represented in similar form on other factors in the model.

These findings highlight the relational complexity that appears to exist between quality of life and affect in older adults. This complexity did not replicate what appears now to be a too simplistic model of quality of life and affect (Lawton, 1996; Lawton et al., 1999). I then explored whether or not these relationships held in a sample of younger adults or if different relationships emerged in adults aged 18 to 59 years.

Quality of Life and Affect in Younger and Middle-Aged Adults

Factor Structure

The items that constituted the factors in the younger sample were quite similar to those that constituted the factors in the older adult sample (Table 1). One major difference was the inability to extract a factor from the time quality measure in the younger sample. Not surprisingly, this time quality measure was designed to study the quality of how one

perceives their daily activities, of great interest in older individuals who have retired (Lawton et al., 1999). In the younger sample, however, it appears this concept of time quality was foreign to them; they may, in fact, never consider the notion of boredom, of not having enough to do on a daily basis. No model fit was achieved from the 7-item measure.

The other factor differences were minor but no less interesting. The positive affect factor in younger adults included the adjective *Excited,* which was not included in the positive affect factor for older adults. It did not include the adjective *Alert,* which was present in the positive affect factor for older adults. The negative affect factor did not include the adjective *Distressed,* which loaded strongly on the negative affect factor for the older adult sample.

The physical health factors were nearly identical in both samples. The only exception was Item 3 from the WHOQOL-BREF, *To what extent do you feel that physical pain prevents you from doing what you need to do?*, which was not included in the younger sample's factor but was in the older adults' physical health factor. Similar to the notion of boredom being foreign to younger people, the notion that physical pain could prevent people from doing what needs to be done also did not resonate with this sample. These slight differences in factor make-up between the samples are telling and foreshadow some of the findings I observed in the structural relationships between these factors.

Although the factors representing the quality of both older and younger adult friendships were formulated with the identical item structure, the family factors were different. The older adult family factor included four items that fit the data poorly. The younger sample family factor fit the data well and included the seven positively worded

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items from Lawton et al.'s (1999) family satisfaction measure. It should be noted here that the qualifier that was viewed as a detriment to this measure in older adults (i.e., that the participant should consider only nonspouse family members when completing these items) was less a problem in the younger sample. Perhaps their families are largely intact, having not yet experienced the loss that permeates the lives of older individuals. Perhaps the younger adults were simply less affected by the exclusion of the spousal relationships in their assessment of their family satisfaction. Because of these differences, a well-fitting family satisfaction factor was extracted in the younger sample.

The last factor, environmental satisfaction, included six items, two of which were not included in the environmental satisfaction factor in the older sample. *Have you enough money to meet your needs?* and *How satisfied are you with your health services?*, loaded on the younger adult but not the older adult factor. The younger adult factor did not, however, include the item *How satisfied are you with your transport?* which was included in the older adult environmental satisfaction factor.

By allowing for differences between the samples through the use of exploratory factor analytic techniques in the creation of the factors for both younger and older samples, I was able to identify interesting differences between the age-groups on some of the measures used in the study. Although this study was not designed to look at these differences for measurement invariance purposes, the differences are interesting from a substantive standpoint. Monetary needs were part of environmental satisfaction of younger people but not older adults, whereas transportation needs were important to the environmental satisfaction of older sample but not the younger sample. Nonspousal family

satisfaction was a strong, coherent factor in the younger sample but not for the older sample.

These findings may not be surprising, but they do highlight the aspects of life that become more or less important across the lifespan. Transportation, taken for granted perhaps in younger samples, becomes increasingly important to older individuals because of sensory degradation and other physical frailties that may limit their ability to drive and therefore put increasing pressure on their independence. Nonspousal family relationships including brothers and sisters, parents and children are greater in number earlier in life and may wield a stronger influence on the lives of these younger and middle-aged adults. For older adults these relationships are limited in number and influence due to the diminishing number of individuals in their support network as well as less daily contact with those still present.

Whereas some might criticize the differences in factor-structure between the younger and older adult samples in this present study, I would argue that this is a strength of the study design. The study allowed for differences in what younger and older adults consider important to their subjective well-being, satisfaction in their relationships with their friends and family, physical health status, environmental quality, and the way they spend their time. Exploratory analysis applied no constraints to the factor extraction process, so if the factors were the same between samples, as was the case in the quality of friendships factor, the methodology allowed for these similarities. Allowing for these differences allowed the structural relationships to be based on what is truly important in those quality-of-life components in each sample.

Structural Models

The initial model fit to the younger sample's data was based on Lawton and colleagues (1999) dual channel hypothesis with externally engaging factors such as satisfaction with one's environment and friendships loading on positive affect and physical health satisfaction loading on negative affect. Because of the complex nature of family quality described by Lawton and colleagues (1999) and the lack of any relationship between family quality and subjective well-being in the older adult sample, I initially allowed this factor to load on both positive and negative affect to explore the nature of this relationship.

As in the older adult sample, physical health satisfaction predicted negative affect, and environmental satisfaction predicted positive affect. The younger adults' satisfaction with their friendships again had no influence on positive affect. There were two findings, however, specific to the younger sample. First, family satisfaction did not influence positive affect but did predict negative affect. Second, the overall amount of variance in positive and negative affect explained by these relationships in the younger sample was substantially less (positive affect = 10%; negative affect = 14%) than in the older sample (positive affect = 20%; negative affect = 22%).

These findings highlight important differences in the relationships between quality of life and subjective well-being across the life span. Family satisfaction negatively influences negative affect, despite the fact that on the surface it may appear to be an externally engaging phenomenon. This association further emphasizes the complex effect that family relationships have on individuals of all ages. For older adults, nonspousal family relationships were not important predictors of their subjective well-being, although, as mentioned earlier, this may reflect inappropriate assessment for the older adult sample.

For the younger sample, these relationships did not influence positive affect but rather negative affect. Does this mean that there is something intraindividual about family relationships, something about these relationships that affect us at our core in such a way as to only affect our negative affect? Although beyond the purview of this study, more research is needed to examine these age-related differences in the quality of family relationships, as well as the relationships between family satisfaction and subjective well-being and the differences that may exist across the life span.

The relationships posited in the structural model, although they fit the data well in the younger sample, explained relatively little of the subjective well-being variance. As individuals age, it appears that factors such as satisfaction with physical health, time quality, and environmental satisfaction play a larger role in the experiencing of greater subjective well-being (higher positive affect, lower negative affect). For younger people, these relationships, albeit significant, are less important. This harkens back to what I discussed regarding what constitutes the factors in younger and older adults. Certain items such as physical pain, boredom, and transportation needs were less important to younger people. In Models 1 to 3 in the younger sample, certain factors were simply less predictive of positive and/or negative affect; the quality of certain aspects of life such as physical health and environmental satisfaction may very well be taken for granted earlier in life. Certainly these quality-of-life components have some effect on well-being, as evidenced by the relationship between the quality-of-life components and subjective well-being, but to a much lesser extent than they do in later life. The older the individual gets, the more important physical health satisfaction, environmental satisfaction, and time quality become.

The physical/social model in which the quality of an individual's friendships and physical health indirectly affect environmental satisfaction fit the data well in the younger sample. Interestingly, the quality of the environment was strongly predicted by the quality of friendships and physical health similar to the strength of the relationships found in the older sample; these relationships explained 46% of the variance in environmental satisfaction in the younger sample and 60% of the variance in older adults.

Although the analyses performed on the younger sample were exploratory in nature (i.e., I did not hypothesize whether or not the relationships observed in the older adult sample would replicate in the younger sample), the relationships themselves from the baseline Model 1 to the more complex Model 4 fit the data well in the younger sample. These findings provide initial evidence that, despite the fact that these relationships explained less total variance in subjective well being earlier in life, the relationships themselves are consistent across the adult lifespan. This further enhances the assertion made earlier in this chapter that the dual channel hypothesis is overly simplistic and that intraindividual factors such as perceived physical health influence both positive and negative affect. They also provide evidence that the importance of these relationships may change as we age. It should be noted, however, that this study was cross-sectional in nature, and I can only hypothesize that these increases in the strength of the effect these quality-of-life components have on subjective well-being does indeed continue as we age. Longitudinal studies such as the MIDUS (Brim et al., 2004) study can better determine whether or not we become more affectively-sensitive to our perceptions of different components of our quality of life as we age.

It should also be noted that the use of factors that were derived using in some instances different items between the younger and older samples is a limitation to the generalizability of these findings. Although this method allowed me to investigate what each sample rated as the most important components of these quality of life factors, it also highlights that there are indeed differences between what different age groups consider important when assessing the different aspects of their quality of life.

Personality, Quality of Life, and Affect across the Adult Lifespan

This present project expanded Lawton and colleagues' (1999) model by including a measure of personality. Because prior research has emphasized the strength of the relation between two of the five personality factors, Extraversion and Neuroticism, and positive and negative affect, only these two personality factors were examined (Tellegen, 1985; Watson, 2000; Watson & Clark, 19844). Because of the complexity of these analyses, I will discuss these findings in two parts: the initial discussion will focus on Neuroticism. The second section will focus on Extraversion.

Neuroticism

Neuroticism has an important influence on quality-of-life assessments and subjective well-being in older adults. The first model to include this personality factor was a simple *one-to-one* model where Neuroticism predicted negative affect, excluding any of the other quality-of-life factors from the model. Neuroticism accounted for 30% of the variance in negative affect, a finding consistent with Watson's (2000) PANAS research as well as that of a more recent meta-analysis reviewing the relationship between personality and subjective well-being (Steel, Schmidt, & Shulz, 2008).

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Tellegen (1985) has long argued that the personality factor of Neuroticism should be renamed Negative Emotionality to highlight the close relationship between the personality factor and negative affect. Steel and colleagues (2008) suggested that these similarities should not be dismissed as merely criterion contamination. In fact, recent research suggests that there may be biological basis for the similarities between personality and well-being, in particular Neuroticism and negative affect (Lasky-Su, Faraone, Glatt, & Tsuang, 2005; Schnika, Busch, & Robichaux-Keene, 2004). These meta-analyses suggested a link between the neurotransmitter serotonin and Neuroticism and a link between Neuroticism and both depression and other affective disorders. Certain individuals may be predisposed to certain affective outputs and perhaps even affective disorders, specifically depression and anxiety-related disorders (Watson, Clark, & Harkness, 1994).

By examining the relationships between personality, quality of life, and subjective well-being, researchers can identify ways in which these different factors relate to one another. Does a Neurotic individual simply always report higher negative affect, or does a Neurotic individual perceive his/her physical health as much worse, which leads to a negative evaluation of the environment and hence a report of both less positive affect and more negative affect? From a clinical standpoint, the second pathway provides a more detailed explanation of the person's thinking and perception of the world and, hence, a more detailed treatment can be designed.

Further highlighting the relationship between Neuroticism and negative affect are the findings in the second personality model in the older adult sample, which included a direct effect of Neuroticism along with the direct relationships of time quality and physical

health satisfaction on negative affect. With the inclusion of Neuroticism in the model, the significant direct relationships on negative affect of both time quality and physical health disappeared. Despite the diminishing of these direct relationships between quality of life and affect, the addition of the personality factor Neuroticism accounted for 10% more variance in negative affect (33%) than did the combination of the two quality-of-life factors alone (23%; for a comparison, see Figures 13 and 17). The interfactor correlations observed in Figure 17 between Neuroticism and the quality-of-life factors illustrate the strong negative relationships between the personality factor and older adults' perceptions of their physical health (-.51), time quality (-.60), and environment (-.48; see Figure 17). The Neurotic older adult was more likely to report being worse off in all aspects of quality of life. These findings are not unique. Keyes, Shmotkin, and Ryff (2002) found that individuals high in Neuroticism were more likely to report lower overall life satisfaction, lower levels of happiness, and higher levels of negative affect. What the findings in the present study also suggest, however, is that increased Neuroticism does indeed affect positive affect through interindividual factors like environmental satisfaction. The more neurotic an older individual, the more likely the person appears to perceive environmental satisfaction as poor, thereby lowering the amount of positive affect experienced.

I conducted hierarchical regression analysis on negative affect to explore these relationships between Neuroticism and the quality-of-life factors further. These findings suggest that the relationship between time quality and negative affect as well as the relationship between physical health and negative affect are dependent on the neuroticism of the individual. As Figures 20 and 21 depict, older adults high in Neuroticism reported high negative affect no matter how satisfied or unsatisfied they were with both their time

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quality and physical health. The relationships changed for older adults who did not report

high levels of Neuroticism. Unlike those older adults with high levels of Neuroticism,

there was a significant negative trend (i.e., lower levels of negative affect were reported as

the quality of an older adult's daily activities and physical health increased) for those

individuals with average and low levels of Neuroticism. Older adults with average levels

of Neuroticism were more likely than older adults with low levels of Neuroticism to report

higher levels of negative affect regardless of how they perceived their time quality and

physical health.

Incorporating the personality factor Neuroticism into the models either directly or

through interactions with other quality-of-life variables highlights the importance of

personality when measuring how older adults perceive quality of life.   As prior research

has shown (Steel et al., 2008), "who we are" is important in how we adapt and compensate

to the changes in life. The more Neurotic an individual is, the more likely that individual

is to report poorer health, less satisfaction with friendships, and worse life satisfaction in

general. As Lawton et al. (1999) pointed out, Neuroticism is an intraindividual

phenomenon that has a direct relationship to the experiencing of negative affect and

depression. The more neurotic an individual, the more prone to reporting depression that

individual is. What the present study also suggests, however, is that the effect of

Neuroticism also influences an older adult's experiencing of positive affect by negatively

affecting more externally engaging quality-of-life components. These findings provide

more evidence that the dual channel hypothesis is overly simplistic.

From a clinical standpoint, gerontologists may be better off assessing the

personality traits of their older patients, especially in the case of the personality factor

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Neuroticism, to achieve a better understanding of how predisposed that individual is to depression or anxiety-related disorders. These assessments combined with measuring an older adult's quality of life across a variety of different areas would provide a clinician a vast amount of data to best assess and treat the older patient. By understanding the relation between how personality, in this case Neuroticism, relates to how the older adult perceives life and how those perceptions effect how "happy or sad" the older adult is, the clinician can best treat that specific older adult and the maladaptive cognitions that older adult is prone to experiencing, which cause negative affective responses (Ayers, Sorrell, Thorp, & Wetherell, 2007; Scogin, Welsh, Hanson, Stump, & Coates, 2005).

Extraversion

Past research has illustrated the close relationship between Extraversion and positive affect (Tellegen, 1985; Watson, 2000). The findings in the present study reflect this close relationship, although it should be noted that the relationship between Neuroticism and negative affect was much stronger. Extraversion alone explained 10% of the variance in positive affect. This finding is consistent with the findings of Steel and colleagues (2008) who found that Extraversion explained 19% of the variance in positive affect, significantly less than the 29% of the variance in negative affect explained by Neuroticism. When added to the quality of life and physical/social models of affect, the inclusion of Extraversion accounted for an additional 6% and 5% of the variance accounted for in positive affect, respectively. Whereas the inclusion of Neuroticism altered the relationships between quality of life and affect, the inclusion of the direct effect of Extraversion had no such effect on the model.

This is not to say, however, that Extraversion's relationship with other quality-of-life variables is less complex than those found in the Neuroticism analyses. In fact, the effect of the interaction between Extraversion and the quality-of-life variables on positive affect is perhaps even more complex. There was a three-way interaction between Extraversion, time quality, and environmental satisfaction. To better understand this finding, the older adult sample was divided into three groups – those low, high and in the middle range of the Extraversion factor scores. Although it was not found in older adults who were low or moderately extraverted, for those who reported higher levels of Extraversion there was an interaction between how they spent their time during the day and the quality of their environment on positive affect (Figure 22). If environmental satisfaction was low, there was no relation between time quality and positive affect. As environmental satisfaction increased, however, the positive relation between time quality and positive affect increased.

As with Neuroticism, understanding only an individual's level of Extraversion and affect may limit the complexity of the apparent relationship. By measuring personality, quality of life, and subjective well-being, a researcher can begin to disentangle these complex relationships. Extraverts will find affective benefits in engaging in social activities that include members of their social support network, and these engagements are closely related to how they perceive the quality of how they spend their daily lives (Watson, Clark, Mclntyre, & Hamaker, 1992). If these extraverts are able to spend their time with their friends, they are increasingly likely to report positive affect. In a related article, Keyes and colleagues (2002) found that those individuals high in Extraversion were more likely to report higher levels of subjective well-being (high life satisfaction, lower

negative affect, higher positive affect) as well as higher levels of psychological well-being (personal growth, purpose in life, self-acceptance and positive relations with others). The present study's findings augment these past findings and highlight the increasing need to expand our knowledge of the complex relationships between personality, quality of life, and affect and how these relationships may predict the development of mood disorders.

Although I did not conduct the same analyses exploring the effects of the personality and quality-of-life indicators on subjective well-being in the younger sample, I did briefly explore the additional effects of Extraversion on positive affect and Neuroticism on negative affect in the physical/social model of subjective well-being in younger sample. Adding a direct relationship from Extraversion to positive affect and Neuroticism to negative affect (Figure 23) accounted for 5% more variance in positive affect and 10% more variance in negative affect. Interestingly, the significant effects of quality of physical health and family relationships on negative affect disappeared with the addition of Neuroticism. These findings resemble what was found in the older adult sample.

What can we take away from these findings? Personality plays an important role in how people evaluate different areas of their lives, and their affective experiences. Neurotic people are more likely to be more critical in how they assess the manner in which they spend their time during the day. It is possible that neurotic older adults may spend their time in less enriching ways as well, in essence a self-fulfilling prophecy. Neurotic older adults may be more sensitive to physical changes as they age, leading to an increase in reporting of negative affect. Extraverted people report more positive affect if they are able to satisfy their sensitivity to externally engaging activities such as spending time with

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their friends during the day. Personality plays a major role in both how we view various facets of our lives and how these views influence our affective experiences.

The addition of personality further complicates the one-to-one relationship of certain external factors to positive affect and internal mechanisms to negative affect. As seen in the present study, Neuroticism affects not only more internal quality-of-life factors such as physical health satisfaction but also time quality, found to share both internal and external mechanistic properties in both this current project as well as in Lawton and colleagues' model (1999).

From a clinical standpoint, understanding the personality profile of a patient may provide a clinician a more detailed understanding of how the patient assesses interactions with the environment. If a neurotic older individual experiences physical changes, this older adult may be prone to an increase in negative affect and hence more prone to depression or anxiety-related disorders. If a therapist is treating an older adult who reports being high on Extraversion, more pleasant event scheduling such as increasing socialization with friends or instituting environmental modifications may increase that person's positive affect. Further research should concentrate on the clinical implications that these relationships may have on the mental health of older adults. Measuring personality and quality-of-life indicators across time in an older adult sample may provide the kind of useful clinical evidence that can aid mental health treatment (Trull & Sher, 1995; Widiger & Seidlitz, 2002).

The exploration in this current project suggests that these complexities are not specific to older adults but are present throughout the life span. More research, including

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longitudinal studies tracking personality and quality of life, will help to shed light on these complexities across time.

It should be noted that a limitation to the factor analytic and structural models in Study 1 described above was the use of maximum likelihood estimation without accounting for the nonnormality of the variables. Violating the normality assumption can lead to poor model fit when in actuality the model fit the data well, or vice versa. Not shown in the dissertation, however, was that some of the preliminary factor analytic and structural models in the two samples were conducted using maximum likelihood estimation after normalizing the raw data. These models showed an increase in the strength of the factor loadings and an improvement in overall model fit including chi square goodness-of-fit tests, the CFI, RMSEA, and NNFI. Thus, although the reported factor analytic and structural models fit the data well, the fit indices and factor loadings may be lower than if the robust weighted least squares estimation procedure were to be used for the categorical variables in Study 1.

Indirect Affect

Structural models replicating the findings using an indirect affective outcome variable, the SNAPAP (Johnson, 2003) in place of the direct affective measure, the PANAS, were not conducted because it was not possible to extract positive and negative affect factors from the SNAPAP. The measure was created in response to prior research that indicated a potential reporting bias that accompanied self-report measures of well-being or affect states (Carp, 1989; Paulhus et al., 1997; Paulhus & Morgan, 1997). More research on what the SNAPAP measures and whether or not there are similarities between

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it and others such as the PANAS needs to be conducted before researchers can reliably and validly use the SNAPAP in modeling-based research projects.

Objective Environment and Affect

Whereas the purpose of the correlational study was to observe the relationship between how people perceive their environment and how this perception affects mood, the purpose of the experimental study was to observe whether or not an individual's mood depended on the objective environment. Would people report higher levels of negative affect when working under their nonpreferred environmental conditions, that is, when they were listening to their least preferred musical selection? The answer was no; negative affect was not influenced by the music playing during the task. The environmental manipulation did, however, produce an interesting effect on positive affect. Participants between the ages of 28 and 49 showed an increase in positive affect when performing the task under their preferred environmental conditions. This was not, however, the case for the older adults. They showed a significant decrease in positive affect when performing the cognitive task under their preferred environmental conditions as compared with their nonpreferred environmental condition.

Why would older adults be adversely affected when listening to the music they enjoyed most when conducting a difficult cognitive task? One would expect that an individual would show either no change or increased positive affect when listening to preferred music. Perhaps it was an example of selective attention. The older adults appeared to struggle with the competing stimuli for their attention: the demanding cognitive task and the musical selection. The cognitive task was challenging and required a great deal of attention, especially for the older adults who are less adept at working

memory tasks such as the one used in this experiment (Hertzog, Dixon, Hultsch, & MacDonald, 2003; Myerson, Emery, White, & Hale, 2003). The task reminds participants of how they are performing by constantly updating their score in the upper right-hand corner of the computer screen. Simultaneously, participants hear their preferred musical selection through headphones. The preferred musical selection is enjoyable and hence a desired stimuli on which to place one's attention. Younger participants have grown up in the iPod age listening to music while they work, but the older adults were thrust into an environment where their attention was split between the two competing stimuli. This competition appeared to be distressing for older adults. In a few cases, the older participants reported to me that they wanted to enjoy the music playing but could not because of the task. They could only attend to one or the other. The reported decrease in positive affect may suggest that the older adults did not enjoy this competition for their attention, similar to age-related differences in dual task interference tasks found in previous studies (Hartley & Little, 1999). These older adults reported that they found it easier to concentrate on task performance in the nonpreferred environmental conditions because they did not like the music and hence paid little attention to it.

Could this be how the environment affects older adults outside of the laboratory? Lively environments may become distressing because the older adult can only attend to so much, akin to the cocktail party effect that takes place with older adults experiencing increased difficulty hearing conversations in noisy settings. It could be that older adults select and adapt their environments to better allow them to attend to one aspect of it, thereby regulating their emotional response to this environment (maximizing positive affect, minimizing negative affect). In the case of the task used here, the older adults

listened to music they enjoyed and performed a difficult cognitive task; to do both meant not enjoying the music to the fullest extent or their performance on the task suffered.

If older adults' goal is to maximize positive affect and minimize negative affect, and if they do this by adapting their environment to do just that, the findings from the neuroticism analysis contribute to the picture. Neurotics struggle to regulate their emotions. They are prone to reporting depressive and anxious traits, easily frustrated and at times impulsive. Recall the significant three-way interaction between age, environment, and neuroticism. With the exception of the 30-year-old age group, individuals 40 years of age and older showed an increased sensitivity to the nonpreferred environmental conditions (i.e., they reported more negative affect) the more neurotic they were. The neurotic older adults, those individuals 60 and older, were particularly sensitive to the nonpreferred conditions. Whereas prior research has shown that older adults may indeed regulate their emotions more successfully than younger adults (Carstensen et al., 2000; Charles et al., 2001), it appears from these results (as was also the case in the correlational study) one must account for the personality of the individual as well. Not only did the more neurotic people report more negative affect under the nonpreferred environmental conditions, but they also displayed a tendency to report more negative affect under the preferred environmental conditions as well (with the exception of the 70-year-old group who showed the opposite trend).

These results taken together suggest two things. First, older adults are sensitive to environmental stimulation and may experience more distress when the environment calls for them to attend to multiple things at once. If older adults do not deem an aspect of their environment worthy of their attention, they focus more clearly on the aspect of the

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environment that does require their attention while inhibiting the effects of the other. If they are interested in attending to more than one environmental component, however, this can overwhelm their attentional resources and decrease positive affect. Second, environmental sensitivity is enhanced if the older adult is also neurotic. The more neurotic the individual, and the older that individual, the more likely the person is to report increasing negative affect when the environment is deemed as either unpleasant or too stimulating.

There are limitations to these findings that must be taken into account. The sample sizes within each age-group were relatively small. The personality results should be considered exploratory in nature and need to be replicated. The computer task was a working memory task that could favor the younger participants in the study both because of age-related changes in executive functioning and because the younger individuals are more experienced in using the computer. As limiting as these factors could be, the fact that difficulty (i.e., speed latency) was adjusted for each individual did help to tailor the experience to the individual's specific capabilities. There was a strong linear trend between the age of the participant and the latency of presentation. The older a participant was, the slower the presentation of the numbers was, consistent with past research citing increased slowing in processing speed as people age (Cerella, 1985; Salthouse, 1996).

Another limitation in this study was the musical selections. Music has emotional connections with an individual; perhaps less emotionally charged environmental manipulations such as light or more generic background noise would have been more effective. Also, giving the participants only seven musical selections to choose from is limiting; more choices should be provided in the future.

Although the study provided interesting findings, these findings are preliminary and without replication. A follow-up study with larger samples in each age group and more musical selections should provide more insight into how the environment can influence mood and how this effect differs across the lifespan. If it is true that the older we get, the more we select our environment to maximize those aspects that increase our positive affect and minimize our experiences of negative affect, then the implications would be, as Lawton had posited, wide ranging in terms of architectural designs of nursing homes, senior centers, and assisted living facilities. It would also have clinical implications in terms of how we assess and evaluate our older adult clients.

Summary

In the correlational study I found that Lawton's dual channel hypothesis (1996) was an insufficient model for explaining the relationships between quality of life and affect. The way older individuals perceive their physical health and their friendships have a complex effect on affective states, an influence that cannot be simplified to the conclusion that externally engaging phenomena influence only positive affect, whereas more intraindividual mechanisms influence only negative affect. In fact, the quality of an older adult's physical health directly influences negative affect and indirectly influences positive affect by influencing the quality of externally engaging phenomena such as environmental satisfaction and time quality, which in turn directly influence positive affect.

The fact that these relationships were also replicated in a younger sample is evidence that the dual channel hypothesis is insufficient as a model of quality of life and affect and that these relationships are as complex in younger adults as they are in older adults. Interestingly, the relationships found in the older adults were similar in the younger

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sample, yet the importance of these relationships (as measured by the amount of explained variance in the affective outcome measures) differed. These relationships were of more import in the older sample, hinting at the possibility that the importance of quality-of-life measures including environmental satisfaction, physical health, and social support increases with age. The findings from Study 2 contributed to this notion. With age, the more it appears we actively select environmental conditions that allow us to maximize our positive affect and minimize our negative affect.

I think perhaps the most important finding from both Study 1 and Study 2 is that personality plays a key role in how individuals perceive their environment, how individuals manage their environment, and how individuals experience affect. No personality characteristic was more involved in these relationships than Neuroticism. A neurotic individual perceived his or her quality of life as poorer than a less neurotic individual. Neuroticism did not just influence the amount of negative affect an individual experienced, but rather it influenced the amount of positive affect an individual experienced as well, thereby providing more evidence for the insufficient nature of the dual channel hypothesis. Neurotic individuals are not only more prone to perceive their lives as lower in quality, but they are also more sensitive to poor environmental conditions.

These studies begin to clarify the complexity of the relationships between how we perceive our lives, how we experience our environments, and how these perceptions and experiences influence our subjective well-being. When we ignore "who we are" (i.e., our personality characteristics), we ignore an important component in understanding at our very core how we perceive our own lives and the environment around us. By improving our understanding of personality and its role in how we as individuals manage our daily

lives, we can better understand how individuals adapt to a changing environment, adapt to

changing competencies, and adapt to aging in a modern society.

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Appendix A

The following is a copy of the questionnaire used in Study 1. The questionnaire has been altered for formatting purposes, but the items are identical to those used in the questionnaire completed by participants. It should be noted that this is the female version of the questionnaire; this only affects the items from the SNAPAP where the gender specific names and pronouns are used.

Quality of Life and Affect

Dear Participant,

Thank you for helping with this important project.

Here is a packet of questions about your thoughts on a variety of topics. Some of the questions are about how you are feeling right now. Other questions are about how you view various aspects of your life.

The entire packet takes approximately 30 minutes to complete. Please answer every question. There are no right or wrong answers. Read the directions on each page and pay careful attention to the different response options throughout the questionnaire.

Results from this project may help us better understand the relationships between people's emotions and how they perceive various aspects of their lives, so your contribution is important. Thank you again for your help.

Sincerely,

Patrick J. Brown, M.A.

Principal Investigator

Demographics

1. What is today's date? _____

2. On what date were you born? _____

3. Gender (circle one):   male   female

4. Highest grade of school you finished: _____

     5. Are you Hispanic or Latino? (circle one) Yes   No

     6. What race are you? (circle all that apply)

1 = American Indian or Alaskan Native

     2 = Asian

     3 = Black or African American

     4 = Caribbean

     5 = Caucasian

     6 = Native Hawaiian or other Pacific Islander

     7 = other; please specify: _____

     8 = don't know

Your Mood and Emotions (PANAS)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate answer next to that word. Indicate to what extent you feel this way *right now*, *at this moment*. (*Note.* Each item consisted of 5 different responses: *Not at All* (1), *A Little* (2), *Moderately* (3), *Quite a Bit* (4), and *Extremely* (5)).

1. Interested   2. Distressed

3. Excited   4. Upset

5. Strong   6. Guilty

7. Scared   8. Hostile

9. Enthusiastic   10. Proud

11. Irritable   12. Alert

13. Ashamed   14. Inspired

15. Nervous   16. Determined

17. Attentive   18. Jittery

19. Active   20. Afraid

Quality of Life (WHO)

The following questions ask how you feel about your quality of life, health, and other areas of your life. Choose the answer that appears most appropriate. Please keep in mind your standards, hopes, pleasures, and concerns. We ask that you think about your life **in the last four weeks**. (*Note*. Responses are *Very poor* (1), *Poor* (2), *Neither poor nor good* (3), *Good* (4), *Very good* (5)).

1. How would your rate you quality of life?

(*Note.* Responses are *Very dissatisfied* (1), *Dissatisfied* (2), *Neither satisfied nor dissatisfied*, (3), *Satisfied* (4), *Very satisfied* (5)).

2. How satisfied are you with your health

The following questions ask about how much you have experienced certain things in the last four weeks.

(Note. Responses are Not at all (1), A little (2), Moderate amount (3), Very much (4), Extreme amount (5)).

3. To what extent do you feel that physical pain prevents you from doing what you need to do?

4. How much do you need any medical treatment to function in your daily life

5. How much do you enjoy life?

6. To what extent do you feel your life to be meaningful?

7. How well are you able to concentrate?

8. How safe do you feel in your daily life?

9. How health is your physical environment?

The following questions ask about how completely you experience or were able to do certain things in the last four weeks.

(*Note*. Responses are *Not at all* (1), *A little* (2), *Moderately* (3), *Mostly* (4), *Completely* (5)).

10. Do you have enough energy for everyday life?

11. Are you able to accept your bodily appearance?

12. Have you enough money to meet your needs?

13. How available to you is the information that you need in your day-to-day life?

14. To what extend do you have the opportunity for leisure activities?

(*Note*. Responses are *Very poor* (1), *Poor* (2), *Neither poor nor good* (3), *Good* (4), *Very good* (5)).

15. How well are you able to get around?

(*Note.* Responses are *Very dissatisfied* (1), *Dissatisfied* (2), *Neither satisfied nor dissatisfied*, (3), *Satisfied* (4), *Very satisfied* (5)).

16. How satisfied are you with your sleep?

17. How satisfied are you with your ability to perform your daily living activities?

18. How satisfied are you with your capacity for work?

19. How satisfied are you with yourself?

20. How satisfied are you with your personal relationships?

21. How satisfied are you with your sex life?

22. How satisfied are you with the support you get from your friends?

23. How satisfied are you with the conditions of your living place?

24. How satisfied are you with your access to health services?

25. How satisfied are you with your transport?

The following question refers to how often you have felt or experienced certain things in the last four weeks.

(*Note*. Responses are *Never* (1), *Seldom* (2), *Quite often* (3), *Very often* (4), *Always* (5)).

26. How often do you have negative feelings such as blue mood, despair, anxiety, or depression?

Quality of Life (Family)

When answering these next questions, consider your relatives with whom you are in close touch or see fairly frequently; how would you say your relations with them are in general (do not include your spouse – but all others)? Circle the response that best answers each question. (*Note*. Responses are *Not at all* (1), *A little* (2), *Some* (3), *Quite a bit* (4), *A great deal* (5)).

1. How much do your relatives make you feel loved and cared for?

2. How much do you feel your relatives make too many demands on you?

3. How much are your relatives willing to listen when you need to talk about your worries or problems?

4. How much are your relatives critical of you or what you do?

(*Note*. Responses are *Terrible* (1), *Unhappy* (2), *Mostly dissatisfied* (3), *Mixed* (4), *Mostly Satisfied* (5), *Pleased* (6), *Delighted* (7)).

5. How do you feel about the way your relatives treat you?

6. How do you feel about the things you and your family do together?

(*Note*. Responses are *Not at all* (1), *Somewhat* (2), *Very* (3), *Extremely* (4)).

7. How close do you feel the relationship is between you and your relatives?

8. How well do you and your relatives get along?

(*Note*. Responses are *Poor* (1), *Fair* (2), *Good* (3), *Excellent* (4)).

9. Overall, what would you say is the quality of your current relationships with your family?

Quality of Life (Friends)

When answering these next questions, consider your friends with whom you are in close touch or see fairly frequently; how would you say your relations with them are in general? Circle the response that best answers each question. (*Note*. Responses are *Not at all* (1), *A little* (2), *Some* (3), *Quite a bit* (4), *A great deal* (5)).

1. How much do your friends make you feel loved and cared for?

2. How much do you feel your friends make too many demands on you?

3. How much are your friends willing to listen when you need to talk about your worries or problems?

4. How much are your friends critical of you or what you do?

(*Note*. Responses are *Terrible* (1), *Unhappy* (2), *Mostly dissatisfied* (3), *Mixed* (4), *Mostly Satisfied* (5), *Pleased* (6), *Delighted* (7)).

5. How do you feel about the way your friends treat you?

6. How do you feel about the things you and your friends do together?

(*Note*. Responses are *Not at all* (1), *Somewhat* (2), *Very* (3), *Extremely* (4)).

7. How close do you feel the relationship is between you and your friends?

8. How well do you and your friends get along?

(*Note*. Responses are *Poor* (1), *Fair* (2), *Good* (3), *Excellent* (4)).

9. Overall, what would you say is the quality of your current relationships with your friends?

Quality of Life (Time)

When answering these next questions, consider how you spend your time throughout the day. Circle the response that best answers each question. (*Note*. Responses are *Never* (1), *Once or Twice a Month* (2), *Once a Week* (3), *Several Days per Week* (4), *Every Day* (5)).

1. How often do you wish the day would be shorter?

2. How often do you wish for more interesting things to do?

3. How often do you get bored?

(*Note*. Responses are *Never* (1), *Occasionally* (2), *Fairly Often* (3), *Very Often* (4), *Always* (5)).

4. How often do you make plans for what to do tomorrow or next week?

How much do you agree with these statements:

(*Note*. Responses are *Disagree* (1), *Disagree a Little* (2) *Neither Disagree or Agree* (3), *Agree a Little* (4), *Agree* (5)).

5. Almost everything I do each day is enjoyable.

6. I have a lot more time on my hands than I'd like.

7. I have plenty of things to do most days.

Quality of Life (Environment)

When answering these next questions, consider the neighborhood and home (i.e., dorm, apartment, and house) in which you live. Circle the response that best answers each question. (*Note.* Responses are *Very dissatisfied* (1), *Dissatisfied* (2), *Neither satisfied nor dissatisfied*, (3), *Satisfied* (4), *Very satisfied* (5)).

1. How satisfied are you with your neighborhood in which you live?

2. How satisfied are you with the home in which you live?

(*Note*. Responses are *Poor* (1), *Fair* (2), *Good* (3), *Very Good* (4), *Excellent* (5)).

3. All things considered, rate your neighborhood as a place to live.

4. All things considered, rate your home as a place to live.

(*Note*. Responses are *Not at all attached* (1), *Not strongly attached* (2), *Undecided* (3), *Strongly Attached* (4), *Very strongly attached* (5)).

5. What is your level of attachment to your neighborhood?

6. What is your level of attachment to your home?

(*Note*. Responses are *Not safe at all* (1), *Slightly safe* (2), *Average* (3), *Quite safe* (4), *Extremely safe* (5)).

7. How safe from crime do you consider your neighborhood to be?

8. How safe from crime do you consider your space to be?

(*Note*. Responses are *Terrible* (1), *Mostly dissatisfied* (2), *Mixed* (3), *Mostly satisfied* (4), *Delighted* (5)).

9. How do you feel about this particular neighborhood as a place to live?

10. How do you feel your home as a place to live?

Personality and Behavior (Mini-IPIP)

This scale contains 20 statements that describe people's behaviors. Read each statement carefully. Circle the response that describes yourself as you generally are now, not as you wish to be in the future.

(*Note*. Responses are *Very Inaccurate* (1), *moderately inaccurate* (2), *neither* (3), *moderately accurate* (4), *very accurate* (5)).

1. I am the life of the party.

2. I sympathize with others' feelings.

3. I get chores done right away.

4. I have frequent mood swings.

5. I have a vivid imagination.

6. I don't talk a lot.

7. I am not interested in other people's problems.

8. I often forget to put things back in their proper place.

9. I am relaxed most of the time.

10. I am not interested in abstract ideas.

11. I talk to a lot of different people at parties.

12. I feel others' emotions.

13. I like order.

14. I get upset easily.

15. I have difficulty understanding abstract ideas.

16. I keep in the background.

17. I am not really interested in others.

18. I make a mess of things.

19. I seldom get blue.

20. I do not have a good imagination.

Emotional Vignettes (SNAPAP)

This measure consists of 30 brief vignettes describing a character in an emotionally provoking life experience. Please put yourself in the place of the protagonist and answer the questions that follow each vignette. Circle the response that best describes how you would feel if you were the main character of each vignette.

(*Note*. Responses for *intensity* questions and *personally responsible* questions are *Very slightly/not at all* (1), *A little* (2), *Moderately* (3), *Quite a bit* (4), *Extremely* (5); Responses for *angry/sad* questions are *Very angry* (1), *Moderately angry* (2), *A little of both* (3), *Moderately sad* (4), *Very sad* (5)).

1. Amy and her husband were still far from their destination, even though they had been stuck in the car together for over 3 hours, quarrelling the whole time.

> How <u>intense</u> do you think this experience was for Amy?

> How <u>angry or sad</u> do you think Amy felt?

> How <u>personally responsible</u> do you think Amy felt?

2. Betsy went shopping at a large department store near her home. When she was leaving the store a guard stopped her and wrongfully accused her of stealing.

> How <u>intense</u> do you think this experience was for Betsy?

> How <u>angry or sad</u> do you think Betsy felt?

> How <u>personally responsible</u> do you think Betsy felt?

3. Christie was driving home in the late morning when a dog ran out in front of her car. She could not stop in time, and ran over the animal.

How <u>intense</u> do you think this experience was for Christie?

How <u>angry or sad</u> do you think Christie felt?

How <u>personally responsible</u> do you think Christie felt?

4. Daphne realized that she was hopelessly lost when she passed the same street corner for the fourth time.

How <u>intense</u> do you think this experience was for Daphne?

How <u>angry or sad</u> do you think Daphne felt?

How <u>personally responsible</u> do you think Daphne felt?

5. Elizabeth was attending dinner at a friend's house when her friend unexpectedly started to lecture her about how she should live her life.

How <u>intense</u> do you think this experience was for Elizabeth?

How <u>angry or sad</u> do you think Elizabeth felt?

How <u>personally responsible</u> do you think Elizabeth felt?

6. Florence returned home from buying groceries to find the front door of her house not only unlocked, but wide open.   She walked into her house and realized that it had been burglarized.

How <u>intense</u> do you think this experience was for Florence?

How <u>angry or sad</u> do you think Florence felt?

How <u>personally responsible</u> do you think Florence felt?

7. Ginny was driving home at dusk on a quiet back road when all of a sudden she got a flat tire and had to pull over in the middle of nowhere.

How <u>intense</u> do you think this experience was for Ginny?

How <u>angry or sad</u> do you think Ginny felt?

How <u>personally responsible</u> do you think Ginny felt?

8. Heather called a friend to tell her about a significant life event. Heather's friend talked so much about herself that Heather did not even get an opportunity to talk about what was bothering her.

How <u>intense</u> do you think this experience was for Heather?

How <u>angry or sad</u> do you think Heather felt?

How <u>personally responsible</u> do you think Heather felt?

9. Ilene and a friend were supposed to meet for coffee an hour ago. When she called her friend she found out that her friend had completely forgotten about their date.

How <u>intense</u> do you think this experience was for Ilene?

How <u>angry or sad</u> do you think Ilene felt?

How <u>personally responsible</u> do you think Ilene felt?

10. Janet woke from a nightmare in the middle of a stormy night with her heart racing.

How <u>intense</u> do you think this experience was for Janet?

How <u>angry or sad</u> do you think Janet felt?

How <u>personally responsible</u> do you think Janet felt?

11. Kathy was walking across a busy intersection when she noticed a child running into the street after a ball. She froze in her steps as she watched a car narrowly miss the child.

How intense do you think this experience was for Kathy?

How angry or sad do you think Kathy felt?

How personally responsible do you think Kathy felt?

12. Laura had come to see off her best friend of many years who was moving to another city. After Laura had waved goodbye and the moving van pulled off, Laura stood on the street corner, with tears in her eyes.

How intense do you think this experience was for Laura?

How angry or sad do you think Laura felt?

How personally responsible do you think Laura felt?

13. After searching everywhere she could think to look, as well as backtracking her every step for the last 2 days, Mary realized that she had lost the diamond ring given to her by her mother.

How intense do you think this experience was for Mary?

How angry or sad do you think Mary felt?

How personally responsible do you think Mary felt?

14. Nancy came into work to find a note requesting her to go to her boss' office. When she asked her boss what this was all about, the boss told her that she was fired.

How intense do you think this experience was for Nancy?

How angry or sad do you think Nancy felt?

How personally responsible do you think Nancy felt?

15. Olga received a telephone call from the local hospital, reporting that a family member had just been admitted to the emergency room. The hospital requested that Olga come immediately because it was very serious.

How <u>intense</u> do you think this experience was for Olga?

How <u>angry or sad</u> do you think Olga felt?

How <u>personally responsible</u> do you think Olga felt?

(*Note*. Responses for questions of how the protagonist *felt* are *Pleasantly content* (1), *Quietly pleased* (2), *Happy* (3), *Excited* (4), *Elated* (5); Responses for how *lucky* the protagonist was are *Very slight/not at all* (1), *A little* (2), *Moderately* (3), *Quite a bit* (4), *Extremely* (5)).

16. Ann was tuning her car radio when she came upon an old, favorite song. It triggered a joyful memory and an uncontrollable smile.

      How do you think Ann felt?

      How <u>lucky</u> was Ann?

17. Beth was just finishing lunch when a stranger came over and returned her wallet that she had lost in the restaurant entrance over an hour before. Thankfully, nothing was missing.

      How do you think Beth felt?

      How <u>lucky</u> was Beth?

18. Cindy was surprised when she received a letter from the Lion's Club telling her that she won the $500 dollar raffle she had entered 2 weeks before.

      How do you think Cindy felt?

      How <u>lucky</u> was Cindy?

19. Diana's daughter called her to tell her that they had just had a baby girl and were planning on naming the child after her.

      How do you think Diana felt?

      How <u>lucky</u> was Diana?

20. Ellen was alone all afternoon while her husband was running errands. When they reunited that evening, her husband kissed her stating "I love you and missed you today."

How do you think Ellen felt?

How <u>lucky</u> was Ellen?

21. Fran was reading the newspaper when the phone rang. The caller was an old friend that she had not seen or talked to for many years. They spent the morning catching up with one another.

How do you think Fran felt?

How <u>lucky</u> was Fran?

22. While dressing for dinner, Georgia slipped into an old jacket that she liked but did not wear often enough. To her surprise she found a $20 bill in the pocket.

How do you think Georgia felt?

How <u>lucky</u> was Georgia?

23. Helen was sitting on the ocean beach, listening to the surf, smelling the salt air, feeling the water and watching the waves.

How do you think Helen felt?

How <u>lucky</u> was Helen?

24. Ivy went to the door, not knowing who in the world would be visiting her that day. To her surprise, it was the florist delivering a beautiful bouquet of flowers to her.

How do you think Ivy felt?

How <u>lucky</u> was Ivy?

25. Janet left the dishes undone after dinner to go read more of a really good book in which she found herself engrossed and could not put down.

How do you think Janet felt?

How <u>lucky</u> was Janet?

26. For two weeks Karen had been thinking about what she would buy for her husband's birthday. When the day finally came, her husband beamed and told her that the present was perfect.

How do you think Karen felt?

How <u>lucky</u> was Karen?

27. On her morning walk Leslie came across a fawn and a doe in a green field. Neither animal saw her as she watched them graze for several minutes.

How do you think Leslie felt?

How <u>lucky</u> was Leslie?

28. After carefully selecting the one she wanted, Martha brought home her new puppy to show it off to the family.

How do you think Martha felt?

How <u>lucky</u> was Martha?

29. Nicole had just started to tutor reading for her grandson. After a few lessons she noticed that the boy had significantly improved from the first time they had met.

How do you think Nicole felt?

How <u>lucky</u> was Nicole?

30. On her way home Olivia was pulled over by a police officer for driving 10 miles over

the speed limit. After a short lecture, she received only a warning.

How do you think Olivia felt?

How <u>lucky</u> was Olivia?

That is the end of the survey. Make sure you have provided an answer for every question.

Please mail this back to me along with one signed copy of the consent form using the

enclosed stamped return envelope.

Thank you for your contribution.

*****

Appendix B

Means and Standard Deviations for all Total Scores for Each Measure by Sample

Measures	Older Adults (289)		Younger Adults (200)	
	M	*SD*	*M*	*SD*
Affect				
Positive Affect	32.20	7.78	29.67	8.33
Negative Affect	12.24	3.29	14.13	5.30
Personality				
Agreeableness	16.71	2.50	16.68	2.56
Extroversion	12.85	3.34	12.75	3.96
Conscientiousness	15.46	2.90	14.88	3.45
Neuroticism	9.11	3.03	10.93	3.62
Openness/Intelligence	14.16	3.06	15.18	3.29
Quality of Life				
Family	36.95	6.44	35.09	7.53
Friends	37.36	4.91	36.90	5.77
Time	28.79	4.93	27.22	5.06
WHO Environment	33.38	4.19	30.33	5.36
WHO Physical	27.38	4.62	28.03	5.49
WHO Social	11.30	1.91	10.68	2.58
WHO Psychological	23.42	3.29	21.81	4.43

Note. All total scores were calculated by summing the items for each of those measures.

Musical Selections from Study 2

Participants listened to seven different brief musical selections and rated their favorite and least favorite of those selections. Prior to hearing the seven selections, participates set the volume to their most comfortable listening level based on a 10 s clip of the *Star Spangled Banner* by Whitney Houston.

Seven Musical Selections:

Country - *Coward of the County* (Kenny Rodgers)

Rap - *Left my Wallet in El Segundo* (A Tribe Called Quest)

Easy Listening – *Easy* (Lionel Richie)

Rhythm and Blues - *Sinner's Prayer* (Ray Charles & BB King)

Reggae - *Funky Kingston* (Toots and the Maytals)

Heavy Metal - *Crazy Train* (Ozzie Osbourne)

Classical - *Serenade in G Major* (Mozart)